Journal of Northern Studies

Vol. 6 • No. 1 • 2012

Published by Umeå University & The Royal Skyttean Society

Umeå 2012

The *Journal of Northern Studies* is published with support from The Royal Skyttean Society and Umeå University

ISSN 1654-5915

Cover picture
Scandinavia Satellite and sensor: NOAA, AVHRR
Level above earth: 840 km
Image supplied by METRIA, a division of Lantmäteriet, Sweden. www.metria.se
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Design and layout
Leena Hortéll, Ord & Co i Umeå AB
Fonts: Berling Nova and Futura
Paper: Invercote Creato 260 gr and Artic volume high white 115 gr

Printed by
Davidsons Tryckeri AB, Växjö

Contents / Sommaire / Inhalt

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JOURNAL OF NORTHERN STUDIES Vol. 6 • No. 1 • 2012, pp. 9–30

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Climate Change, Moose and Humans in Northern Sweden 4000 cal. yr BP

ABSTRACT Major cultural and environmental changes took place in the interior of Northern Sweden, beginning about c. 4200 cal. yr BP (or 2200 cal. BC). We present a causal, plausible, relationship linking climate change, a key resource and human culture. Moose (*Alces alces*) disappeared relatively fast from the human culture evidenced by a rapid decrease in usage and symbolism. Given the climatic data reconstructed at hand, a drastic change towards colder and wetter conditions seems to have happened 4200–3600 BP, which affected moose population numbers and composition significantly. After analyzing multiple data sources we suggest that moose had become very rare due to climate change and that many of the northern Fennoscandian hunting cultures had no choice but to change their subsistence pattern and, perhaps, change their general way of life, as a response to the altered situation. Linking the past to the present we speculate whether climate change as the primary driver, together with human harvest as the secondary, can result in fast extinction of a key species.

KEYWORDS 4000 BP, northern Fennoscandia, moose, climate, humans, changes

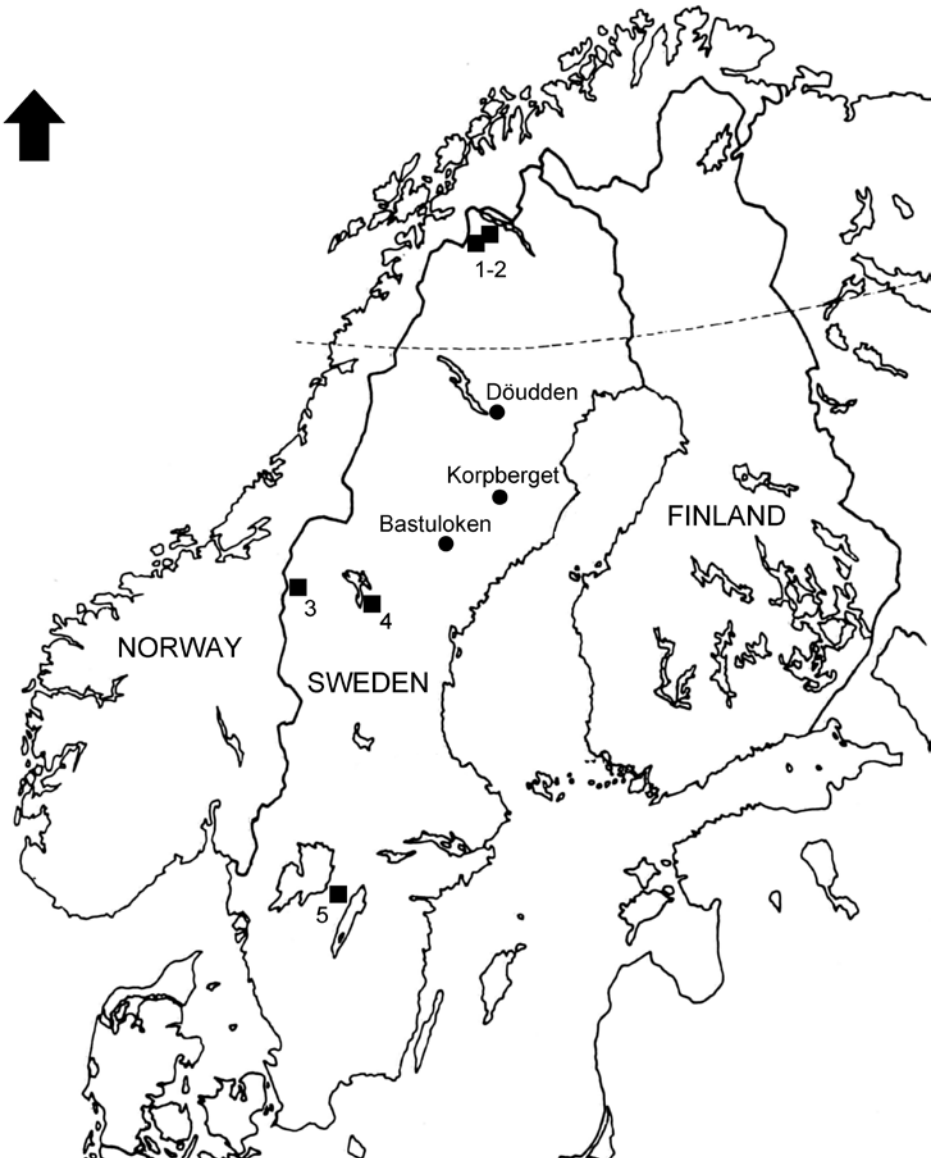


Fig. 1. Map of Fennoscandia with three of the archaeological sites mentioned in the text marked. The square symbols mark sites with lake isotope records used in this study: 1–2) Alakkasjaure; 3) Spåime; 4) Blektjärnen; 5) Igelsjön.

Introduction

The abrupt climate change that occurred around 4000 cal. yr. BP (see Fig. 2) coincides with a major societal change among the hunting communities of northern Fennoscandia. The distinct period 4200–3800 cal. yr. BP marks the very end of a more than two millennia long economic and cultural relationship between moose and man. It is the termination of this bond and its potential cause that is the focus of this paper. The change in the northern hunting communities occurring about 4000 BP has been known for a long time among archaeologists, but it has mainly been interpreted in sociocultural terms (e.g. Baudou 1978; Baudou 1992; Forsberg 1985; Forsberg 1988).

The key question is which environmental change scenario can best explain the sudden disappearance of moose from available data sources as evidenced by archaeological data and cultural representation? Most likely the answer lies in the combination of how moose life history evolved (i.e. how an individual optimizes its resources over the entire life span to balance reproduction and survival (Stearns 1992; Ericsson & Wallin 2001; Ericsson *et al.* 2001)) and short-term climatic variation mediated via forage availability and plant quality (Albon & Langvatn 1992; Fryxell & Sinclair 1988; Ericsson, Ball & Danell 2002). We lay the foundation for our analysis by starting with exploring the human culture at that time. The dates in this paper are given as cal. years (yr) BP, unless otherwise noted.

Compared to South and Middle Sweden, the evidence of farming is extremely sparse in Northern Sweden during the transition from the Neolithic to the Epineolithic period. Some of the earliest indications of farming are provided by pollen analyses from the Bothnian coast in the province of Medelpad (4600 BP; Huttunen & Tolonen 1972), and carbonized seeds have been found at the excavation of a Neolithic coastal settlement at Bjästamon in Västernorrland (4600–4500 BP; Runeson 2007: 94–95). In the interior of Northern Sweden there is no early evidence of farming, but plant food may have been a complement to meat and fish. Instead, an abundance of archaeological data from the Mesolithic and Neolithic periods strongly suggests that hunting and trapping wildlife, combined with fishing, constituted the main subsistence activities, more or less until the first centuries AD (e.g. Baudou 1977: 141; Baudou 1992: 64 f.).

In the hunting/trapping context, one animal in particular—moose (*Alces alces*)—achieved a very special status among the Neolithic human population, both in a symbolic/ritual way, as well as being the main course on the menu (Ekman & Iregren 1984; Spång 1981; Lindgren 2001; Ekholm 2007; Larsson 2009; Larsson 2010a; Larsson 2010b). As early as the late Paleolithic era, bones from moose are found in Russia, and during the Mesolithic

era we witness what has been described as "the Early Holocene expansion of the moose in Eurasia" (Sher 1987: 89 ff.; Holm 1991: 96).

Bones from Neolithic settlements in Northern Sweden (Ekman & Iregren 1984) show that moose and beaver (*Castor fiber*) were the two most hunted mammalian species. Moose has a long history in the northern parts of Europe, Russia and Siberia as an animal of ritual importance. Archaeological sources strongly indicate that moose played a significant role in the metaphysical, ritual and artistic dimension of the northern hunter's worldview (Tilley 1991; Lindgren 2001; Lindgren 2002; Fandén 2002). For example, moose-head staffs of antlers from the Oleniy-Ostrov cemetery in Lake Onega, are dated to c. 7500 BP (Gurina 1956; Carpelan 1977; Lindqvist 1994: 240 ff.; Zhul'nikov 2006: 172). The distribution of moose- and bear-related artefacts from the Mesolithic and Neolithic eras in north-western Eurasia is illustrated by Fig. 3.

Climate Change

The long term evolution of Holocene temperature change in Fennoscandia, with an early- to mid-Holocene warm period and a late-Holocene cooling, has mainly been reconstructed using fossil plant evidence in lakes and peat archives (e.g. Bjune *et al.* 2004; Davis *et al.* 2003; Barnekow *et al.* 2008; Seppä *et al.* 2009). Data with higher temporal resolution indicates that shorter-term smaller temperature anomalies (e.g. Seppä *et al.* 2009) and vegetation shifts (e.g. Hammarlund *et al.* 2004; Karlsson *et al.* 2007) occurred superimposed on the general trend. Reconstructions of past changes in lake and peat bog hydrology indicate that significant regional shifts in precipitation also occurred. A key event was the synchronous and dramatic shift that occurred around 4000 BP (Hammarlund *et al.* 2003; Rosqvist *et al.* 2004; Rosqvist *et al.* 2007; Väliranta *et al.* 2007; St. Amour *et al.* 2010; Andersson *et al.* 2010; Charman *et al.* 2009; Jonsson *et al.* 2010a).

Reconstructed annual and July temperature deviations based on pollen and chironomids (not biting midges) reveal that small negative annual temperature (0.1 C) and July temperature (0.2 C) deviations occurred around 4000 cal yr BP (Seppä *et al.* 2009; Velle *et al.* 2005). These fairly small deviations in temperature can hardly explain the detected vegetation shifts in the alpine tree line zone (Hammarlund *et al.* 2004; Karlsson *et al.* 2007).

Reconstructions of past changes in oxygen isotopic composition of lake waters show a common and rapid response to a major change in precipitation after 4200 cal yr BP. Two of the studied lakes are located above the present tree line, in Jämtland and northern Swedish Lapland (Fig. 2). These are through flow systems with relatively short lake water residence time

(Jonsson *et al.* 2010b; St. Amour *et al.* 2010). From the through flow lake records we infer that the amount of winter precipitation increased and that melting snow influenced the lake water isotope composition over the summer, which has been recorded by the diatoms and aquatic cellulose used for the reconstructions. The lower temperatures (Seppä *et al.* 2009) shortened the ice and snow free period. A comparison between isotopic records from these lakes and meteorological parameters over the past c. 150 years shows that the general isotope depletion occurring over this time period, and the isotope minima occurring at the end of the 1980s/early 1990s can best be explained by an increase in winter precipitation (Jonsson *et al.* 2010b). This increase can be related in turn to the North Atlantic Oscillation's (NAO) positive phase.

The change detected in the isotope records in the closed lakes (Västergötland and Jämtland) at the same time is also best explained by a relative increase in winter precipitation, which depleted the lake water (which is recorded by the authigenic and biogenic carbonates in the lakes), and by cooler and probably also more humid summers which decreased evaporation (Hammarlund *et al.* 2003; Andersson *et al.* 2010).

From the simultaneous response in all these lakes (Fig. 2) we infer that

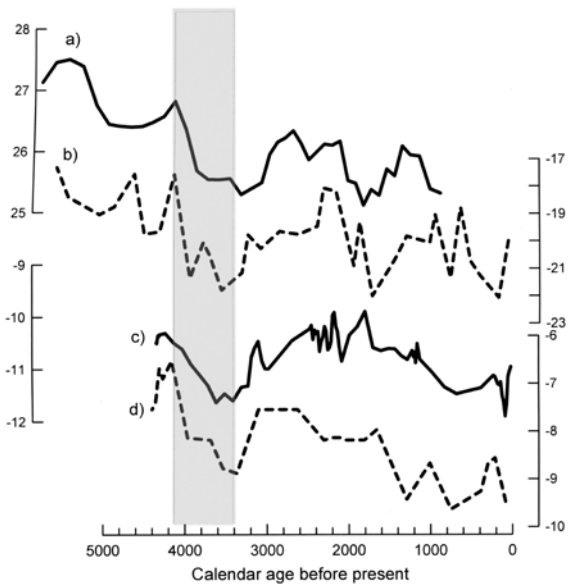
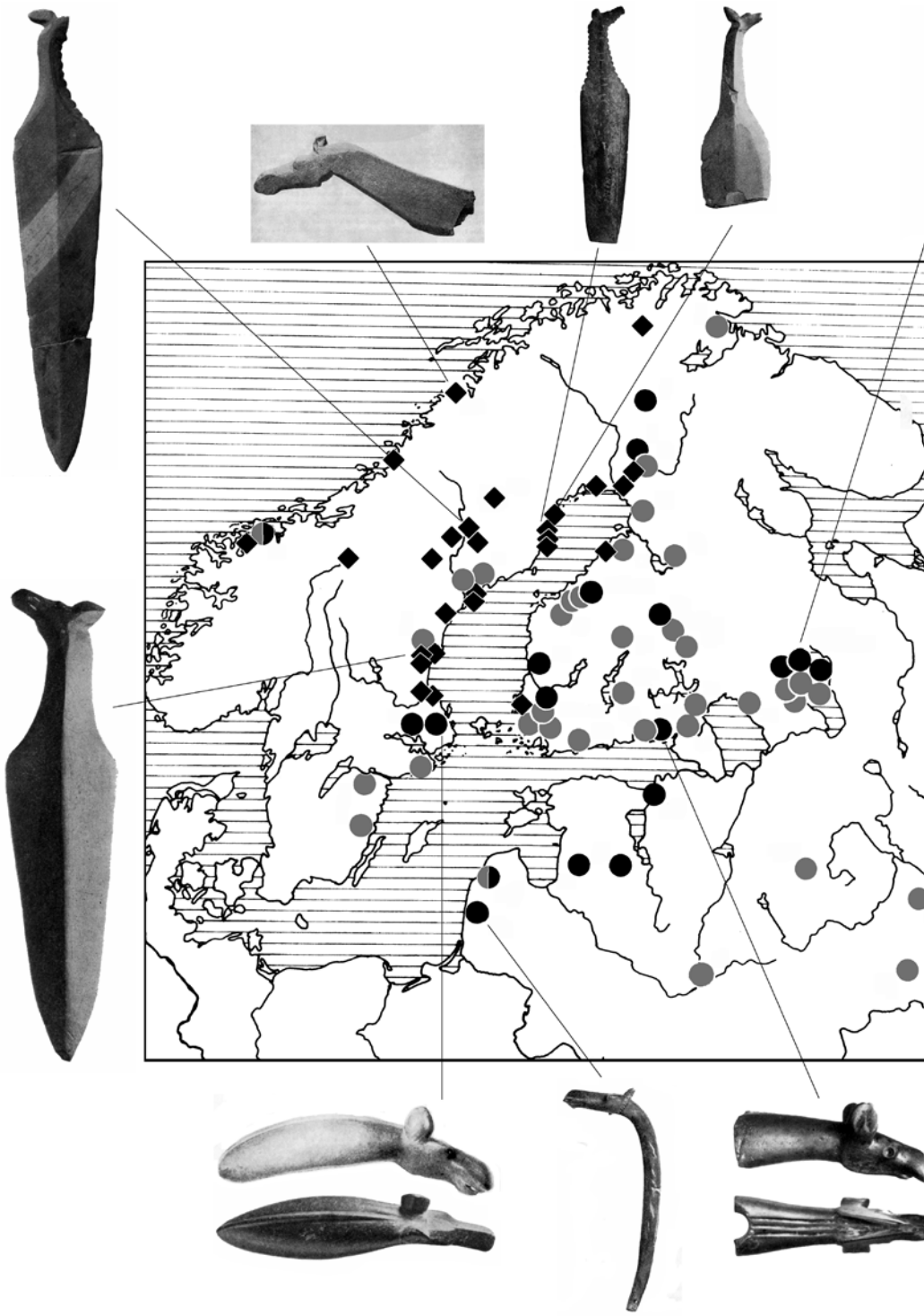


Fig. 2. Four climate reconstructions based on stable isotopes in lake sediments. a) $\delta^{18}O$ from diatoms, Vuolep Alakkasjaure, Lapland (Rosqvist *et al.* 2004); b) $\delta^{18}O$ from aquatic cellulose, Lake Spåime, Jämtland (St. Armour *et al.* 2010); c) $\delta^{18}O$ from carbonate, Lake Blektjärnen, Jämtland (Andersson *et al.* 2010); d) $\delta^{18}O$ from carbonate, Lake Igelsjön, Västergötland (Hammarlund *et al.* 2003).



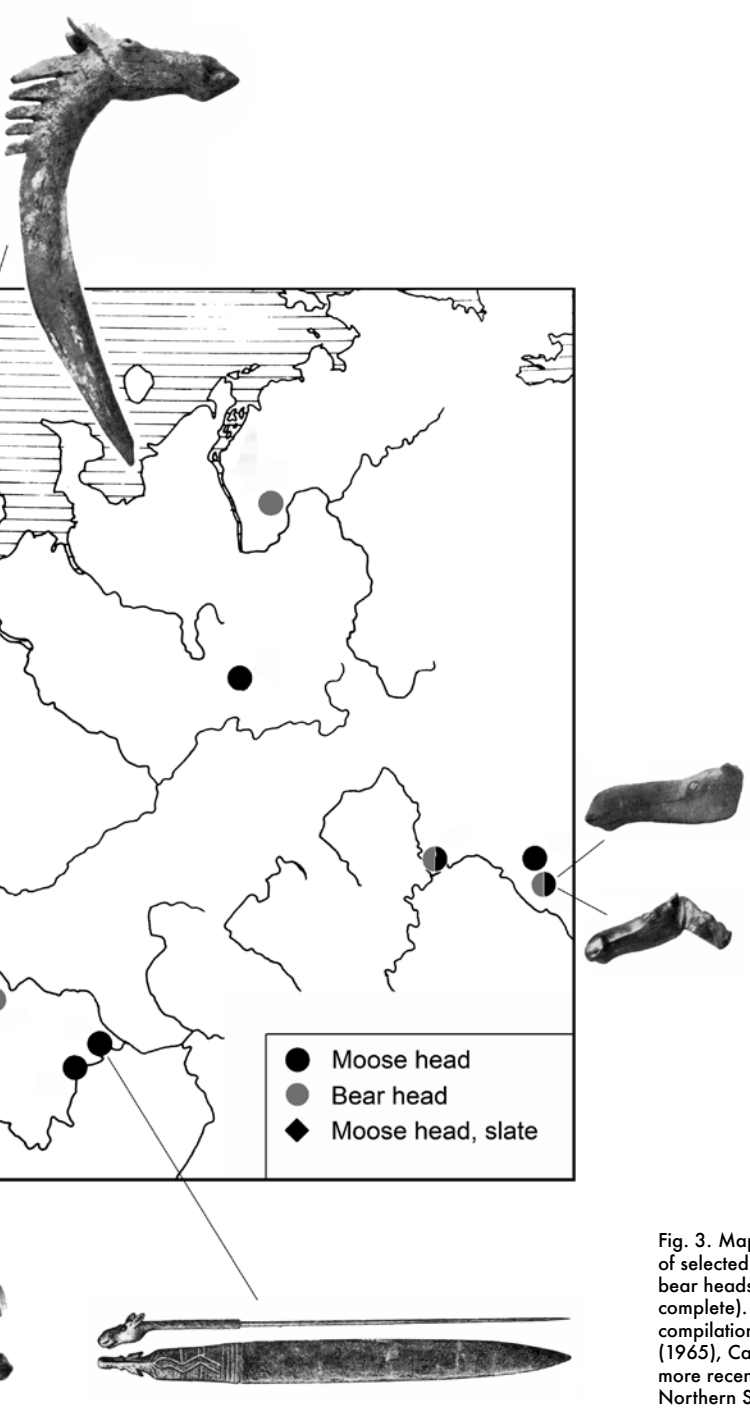


Fig. 3. Map showing the distribution of selected artefacts with moose and bear heads in Northern Europe (not complete). The map is based on a compilation of data from Meinander (1965), Carpelan (1977) and some more recent finds of slate items from Northern Sweden.

the rapid shift in precipitation after 4200 cal yr BP must have been caused by a significant and persistent change in atmospheric circulation, which was most likely associated with a shift in the NAO pattern. The palaeoclimatic data indicates that this climate deterioration lasted almost 1000 years.

We conclude that the increase in winter precipitation, which prolonged the snowmelt period and shortened the vegetation period had, together with the minor lowering of temperature (Seppä *et al.* 2009), a significant effect on natural resources and on human society.

Archaeological Evidence

The Neolithic harvesting of moose is particularly evident when excavating a certain type of site in the interior of Northern Sweden, characterized by semi-subterranean structures with a surrounding embankment (Swedish *boplatsvall*). The structures have been interpreted as walls surrounding houses, used mainly during the winter (Janson & Hvarfner 1960: 34; Rydström 1984; Baudou 1977: 98; Baudou 1992: 62; Lundberg 1997: 125 ff.; Spång 1997: 87 ff.). On these sites bones of moose comprise 90–98 per cent of all the bones found at excavations, while the rest mainly derives from beaver (Ekman & Iregren 1984; Lundberg 1997: 114; Ekholm 2007; Larsson 2009; Larsson 2010a; Larsson 2010b; Larsson *et al.* 2009).

According to available archaeological information, the primary use of the embanked semi-subterranean structures in the interior of Northern Sweden with traces of large-scale moose processing ended around 3700 BP (Lundberg 1997).

A recent excavation of a small part of an embankment (5 m^3) of a semi-subterranean structure at Bastuloken in Västernorrland, Sweden, produced 30 kilos of unburnt bones from moose (Storå *et al.* 2011). According to the osteological analysis of the bones from the site, the intense splintering of even the smaller toe-bones from moose (to get the marrow) might be an indication of food shortage (Storå *et al.* 2011: 58)—a signal of a declining moose population in the area.

Twelve pieces of bone from different stratigraphical layers (by 10 cm in depth) have been ^{14}C dated (Larsson 2009; Larsson 2010a). The excavated part of the embankment had accumulated moose bones during a period of c. 500–600 years (4400–3800 BP), and the most intense bone deposition occurred at the beginning of that phase, between 4400 and 4200 BP (Fig. 4). If we transform these figures to cal. BC (2δ), the most intense phase took place 2500–2275 cal. BC. During the two first centuries of moose processing at Bastuloken, about 80 per cent of the total amount of bones in this part of the embankment was deposited. During the following 400 years, the

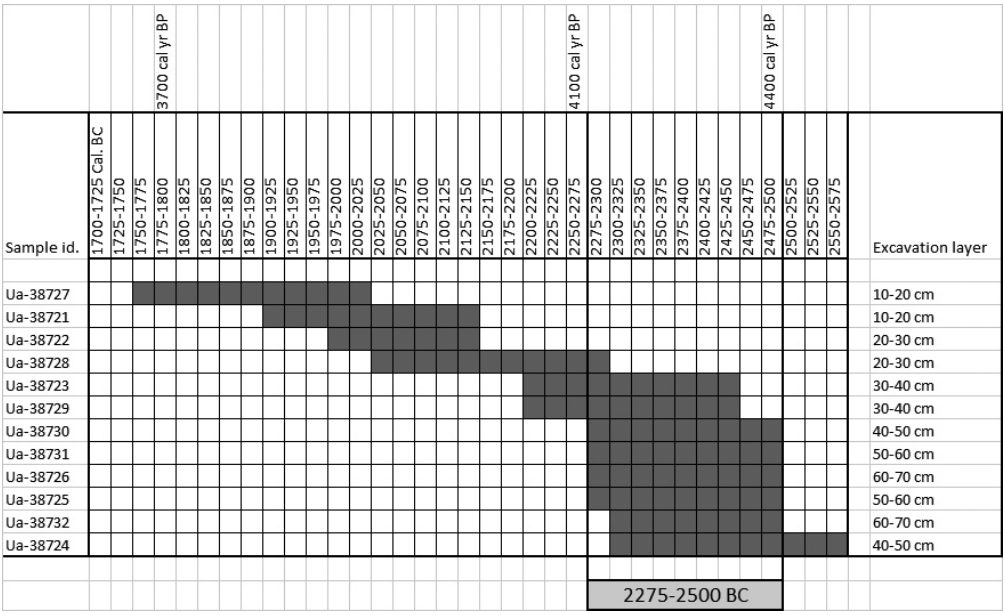


Fig. 4. Twelve ^{14}C dates (2δ) from the embanked site at Bastuloken, Västernorrland, Sweden, arranged in a chronological sequence. Each box represents a time interval of 25 years.

accumulation of bones was less intense. This is indicated by the increased temporal distance between the dates for each excavated layer from the period after 4100 BP (Fig. 4). We can also see that the older layers contain more moose bones from smaller individuals than in the later strata (Storå *et al.* 2011: 61). This might indicate a changed harvesting pattern where larger animals were preferred, or it indicates reduced reproductive performance and consequently a higher proportion of older and thus larger animals in the entire moose population during the period 4400–3800 BP.

If we are to interpret the information given by the ^{14}C dates, the construction was established shortly after 4500 BP, and the moose related activities were very intense during the first two centuries. After that short "overture" something happened; perhaps the climate change discussed above, which drastically reduced the moose population in the region. The date 3800 BP marks the beginning of the end at Bastuloken, and the structure was abandoned, at least for moose processing purposes.

Data from the osteological report by Ekman and Iregren has been used to inform on the presence/absence of bones from moose, reindeer and beaver from excavated and dated sites. For example, from the Neolithic period 20 sites contained bones from moose, 20 sites had bones from beaver, while only 5 sites contained bones from reindeer. According to this data, both

moose and beaver have their peak during the Neolithic era. If calculating the importance of the three species in terms of body weight, Ekman and Iregren (1984: 38) are very specific: "The total dominance of elk [moose] is fully evident from the table. The yields of beaver and reindeer are of only marginal importance compared with the elk."

An osteological analysis of material from Döudden—a prehistoric settlement with three chronological layers, close to Arjeplog in Norrbotten, Sweden—also shows the decrease in moose harvesting after 4200 BP (Bergman 1995: 108 ff.). The dating of the layers is: Layer A 7200–5800 BP; Layer B 4200–3400 BP; Layer C 1800–1600 BP (Bergman 1995: Table 17). Bones from moose dominate Layer A, while bones from beaver and reindeer are in total dominance in Layer B. In the youngest phase, Layer C, the moose bones, once again, dominate the scene, even if the absolute quantity of bones is lower compared with Layer A (Bergman 1995: Tables 20–21). The shifting frequency of moose bones from the different chronological layers at Döudden fits nicely with the general model proposed in this paper, suggesting climate change causing a period of "moose drought" between c. 4000 and 3000 BP.

Pitfall Traps

In parts of Northern Sweden (Jämtland, Västernorrland and Västerbotten in particular) there are large numbers of preserved pitfall traps from prehistoric and historical times (Kjellström & Selinge 1994: 60 f.). The use and dating of pitfalls have been discussed among archaeologists (e.g. Spång 1981; Spång 1997; Hansson & Rathje 1995/1996; Ramqvist 2007), and this hunting technique was used in Sweden, Norway and Finland for thousands of years. In Sweden it was forbidden by law in 1864. The pitfalls were used for catching both moose and reindeer (*Rangifer tarandus*), and excavations in Finnish Lapland have revealed Neolithic pitfall systems that were mainly used for reindeer trapping, judging from the bone materials found on nearby contemporaneous settlements (Halinen 2005: 111). In the Northern Swedish woodland zone the situation is different, with a pronounced emphasis on moose trapping during the Neolithic era, while reindeer seem to gain in economic importance during the Epineolithic and Early Metal Age (Ekman & Iregren 1984; Forsberg 1985; Aronsson 1991).

Many of the Northern Swedish pitfall traps have been excavated and a compilation of ^{14}C dates from the province of Västerbotten is shown in Fig. 5 (based on Spång 1981 and Selinge 2001). The ^{14}C dates presented by Spång (1981: 284) and graphically presented in Broadbent (1982: 90), are taken from many different excavated sites in Västerbotten, while the dates presented by Selinge (2001: 181) derive from only three pitfall systems along the Stavse stream in Åsele parish. The diagram (Fig. 5) shows a notable gap in dates be-

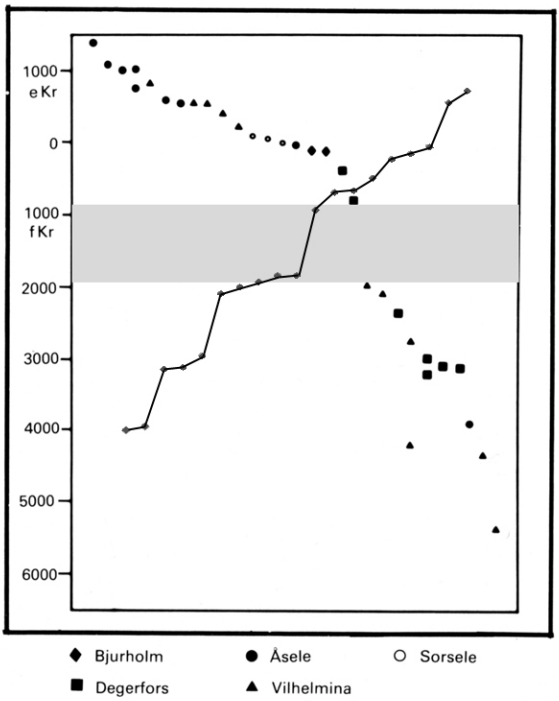


Fig. 5. Compilation of ^{14}C dated pitfall traps (cal. BC) from five parishes in Västerbotten, Sweden (after Spång 1981). The ^{14}C dates connected by a line are from excavated pitfall traps along a single stream (Stavse stream) in Åsele parish (Selinge 2001: 181). The two independent series both show a notable 'gap' between c. 2000 and 1000 cal. BC (4000–3000 cal. yr BP).

tween 4000 and 3000 BP for the Stavse series, and the same gap can be noted for the series presented by Spång (1981). In the province of Jämtland, 88 pitfalls have been ^{14}C dated (by 2004) and only four of these are dated to the Neolithic period (earlier than 4000 BP). Instead, the majority of the dated pitfalls belong to two other chronological phases, one older 3300–2200 BP, and one younger phase, ranging between 1700 and 400 BP (Bengtsson 1993; Lofterud 2005: 27; Ramqvist 2007). Altogether 66 per cent or 58 of the 88 dates from Jämtland belong to the younger phase. The extremely few Stone Age dates from Jämtland mark a major difference if we compare with the dates from the adjacent province of Västerbotten, from which we have distinctive ^{14}C evidence of pitfall trapping during the Neolithic era. Compared to the embanked semi-subterranean structures, which became extinct c. 3800 BP, the pitfall traps were just going through a long but temporary abandonment. A millennium later, some of the old pits were restored and new trapping systems were constructed (Selinge 2001: 181; Ramqvist 2007).

The End of Moose Symbolism and the Beginning of a New Era

Neolithic rock carvings and rock paintings in the region are totally dominated by images of moose, for example at the famous site Nämforsen in Ångermanland, Sweden (Hallström 1960; Larsson & Broström 2011). Also, small stone sculptures as well as ornaments on stone (slate) tools from the Neolithic feature moose heads (Almgren 1911: 152 ff.; Hallström 1960; Baudou 1992; Lindqvist 1994; Lindgren 2001; Lindqvist 2002). At Nämforsen, more than 1000 images of moose were engraved in the naked rock surfaces close to the rapids (Engelmark & Larsson 2005; Larsson & Broström 2011). Here we also find images of humans with moose-head staffs in their hands, similar to the real staffs found in Oleniy-Ostrov (Fig. 3). New ^{14}C results from a recent excavation of a prehistoric settlement downstream of the rapids, suggest that the human activities at Nämforsen started already 6000 BP (Larsson & Olofsson 2006; Larsson 2008). The long-term human activities close to the rock art in Nämforsen have been discussed for a long time by archaeologists (for recent contributions, see Käck 2009 and Sjöstrand 2011), but, interestingly enough, it seems as if the most intense use of the activity area closest to the carvings (the Ställverket site) belongs to a later date than the majority of the moose images, that is, after c. 3700 BP (Ericsson 1996: 44; Käck 2009: 61 ff.). This phase is characterized by bifacially chopped arrow- and spearheads of quartzite or similar materials. So, the major manufacturing and deposition of artefacts at Ställverket in fact occurred slightly after the "palmy days" of rock art.

The rock paintings at Korpberget (two moose images and spots of red colour), in Västerbotten, Sweden, mirror the same phenomenon as Nämforsen, with human activities adjacent to the rock art some centuries after the period of making them. Excavations in 2009 and 2010 at Korpberget revealed a concentration of charcoal dated to 4400 BP (2500 cal. BC), while the artefacts found—27 arrowheads of bifacially chopped quartzite—belong to a later phase, that is, 3700 BP or later (Fig. 6). At both Nämforsen and Korpberget people made images of moose before 3700 BP and in the following centuries they returned to these places to "sacrifice" or manufacture objects of the new material quartzite in great quantities. The arrowheads at Korpberget were found in more or less the same square metre at the excavation, but no traces of chopping debris were found. The arrowheads (or complete arrows) were manufactured elsewhere and brought and deposited (perhaps sacrificed) close to the rock painting.

Arrowheads of quartzite have also been found directly beneath rock paintings (featuring moose, humans and a bear) at Flatruet in Jämtland,

Fig. 6. Photo showing the 27 quartzite points in bifacial technique found when excavating in front of the rock painting at Korpberget, Lycksele (Photo: P. Engman/County Museum of Västerbotten).

Sweden (Hansson 2006). An excavation carried out in 2003 below the painting revealed three arrowheads of quartzite. The points of the arrows were all damaged and splinter was found together with the arrows, indicating that the arrows were actually shot against the painted images. The arrowheads from Korpberget were not damaged in this way.

Once again we can see a time lag between the making of rock art and the later activities in front of them (offerings or rituals), involving the new quartzite material and bifacial chopping technique. The later activities could have been rituals and sacrifices, with the main purpose to bring moose back to the old trapping and hunting grounds—a quite "logical" behaviour in times of drastic climate change and a moose population at the edge of extinction.

Concluding Discussion

We argue that the documented climate change between 4200 and 3800 BP caused a rapid and major drop in moose population in the interior of Norrland. This drop is the main cause behind the archaeologically noted decrease in the amount of moose bones found on excavated settlements from that period and the total abandonment of moose symbolism in society. Further, we believe that the changes in the use of raw materials for tool making recorded at that time—from quarts/slate to quartzite—is related to changes in hunting techniques and strategies, which included and increased exploitation of reindeer (Forsberg 1985). We argue that these observed changes were related to a major decline of moose population, triggered off by an abrupt climate change.

Given a scenario with a drastically changed climate in just a couple of hundred years, moose may be losers that dragged humans along with them or at least changed human culture. The climate reconstructions above show that the weather became wetter and colder. Spring likely arrived later, summers became shorter and maybe autumn also arrived earlier. Moose were thus likely to be affected in several ways during the annual cycle.

Female moose in colder climate with shorter growing seasons will suffer relatively higher costs of somatic effects (body mass, size) on reproduction. Fewer females will be in such a good condition physiologically that they will come into heat and be ready for mating in September–October—given the length of the vegetation period is reduced. Furthermore, females both weaning calves *and* migrating may be less capable to alter both timing of migration and reproduction. Females will therefore most likely increase the time between subsequent litters, further reducing the population growth rate. Despite the harsher conditions in our scenario, some females will reach the physiological threshold later in the autumn. Thus, they will breed later and consequently give birth later and miss the crucial timing to phenology.

Moose in Sweden follow Bergmann's rule with larger body sizes on northern latitudes (Ball *et al.* in revision). In Sweden, from the very north to the very south, the body size difference is in the order of one magnitude roughly correlating with seasonality. As capital breeder it stores energy when conditions are favourable for later use. This is a strategy beneficial in landscapes with a strong seasonal component like in northern Fennoscandia and also buffer so animals can keep a foothold in the landscape. For female moose as capital breeders, the timing of reproduction and the summers are of critical importance, as they are facing conflicting demands from lactating calves and regaining lost body mass.

Overall, put in the historical perspective of climate change, longer win-

ters resulted in shorter vegetation season and a retreat of the forest line. Summers were likely also wetter and somewhat cooler. Although this may not have been detrimental for the living conditions of moose, the shorter growing season and probably deeper snow during winter reduced the reproductive rate and increased the death rate. As a result moose distribution was restricted to the best habitats of the region and as a consequence they became more vulnerable to human persecution. In short, conditions probably worsened so fast that moose could not adapt fast enough or retreated from northern Fennoscandia. The fate of moose thus probably reshaped the whole of human society according to the line of argumentation (Ericsson *et. al.* 2011).

Our argumentation brings us into the old archaeological-anthropological debate on whether hunter-gatherer adaptation to ecological change also produced cultural change (Steward 1955; Binford 2001); an issue most recently addressed by Jordan (2008). If this is a "universal law" or not is not theorized here, but we interpret the events occurring about 4000 BP in the interior of northern Sweden as being triggered by an abrupt climate deterioration causing a major decline of the moose population. The changes that are observable in the archaeological data from Northern Sweden around 4000 BC are illustrated in Fig. 7.

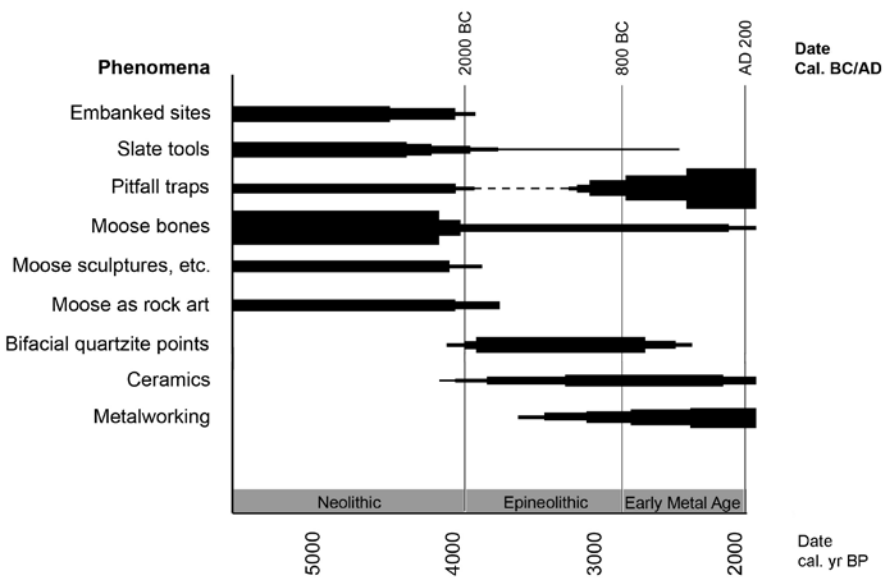


Fig. 7. Major changes in Northern Sweden c. 4000 cal. BP, as evidenced by selected archaeological sources.

The changes observable in the preserved material culture from the subsequent "Epineolithic period" include many new features (Baudou 1978: 17; Baudou 1992: 95 ff.; Forsberg 2010): Chopped points (quartzite) in bifacial technique; Points of Sunderøy type of slate; The introduction of ceramics; The introduction of bronze metalworking (casting).

A major change in the settlement pattern among the North Swedish hunting communities (c. 3800 BP) has been suggested by Forsberg (1985; 1988: 95 ff.), with summer base camps and reindeer trapping in the mountain foothill areas, and winter dwellings in the forest zone.

The exploitation of reindeer in the mountain foothill areas is a new feature in this model, and perhaps a response to a diminishing moose population in the forest area. A colder climate, with increased tundra vegetation in the mountain foothill regions, could have favoured the reindeer population at the same time as it significantly reduced the moose population in the woodlands. In this scenario the changing settlement pattern with hunting camps in higher terrain, as noticed by Forsberg (1985), becomes easy to explain; it was the result of human adaptation to a new major food source, triggered off by drastically changing climate conditions. In Northern Finland reindeer seem to have been a major food resource during both the Neolithic and the Epineolithic periods (Halinen 2005). The decrease in moose hunting and increase in reindeer harvesting in the interior of Northern Sweden during the Epineolithic period, discussed here and by Forsberg (1985), cannot be archaeologically identified in Northern Finland.

In the interior of northern Fennoscandia, the material culture now shows clear signs of eastern contacts, reaching towards Northern Russia and Siberia. This is particularly evident if looking at the thin spear- and arrowheads of quartzite, made in bifacial chopping technique (Baudou 1992: 95; Forsberg 1985). Also, the early pottery (Hulthén 1991; Forsberg 2001) and the types of metal artefacts (and casting moulds) found in this area, point towards eastern connections, maybe as a result of certain individuals' exchange networks, rather than large-scale communal contacts. This idea has recently been applied to the Fennoscandian Epineolithic period by Forsberg (2010), following the "Actor-Network-Theory" outlined by Latour (2005).

Following the hypothesis of climate change as a major cause behind changes in the human exploitation of moose, we must also note that the return of the forest cover in northern Fennoscandia around 1600 BP (as observed by Karlsson *et al.* 2007: 45), correlates extremely well in time with the real boom for the construction of pitfall traps in Northern Sweden (Ramqvist 2007: 170)—the moose had returned in great numbers and the hunt was on! The increase in moose harvesting around 1600 BP is also noted at the settlement at Döudden in Norrbotten (Bergman 1995: Table 21).

The expansion of sedentary farming communities along the Bothnian coast and river valleys (1800–1000 BP), and their need for furs and skins, could also be a factor explaining the "pitfall boom" among the hunters of the interior, with whom the farmers most certainly traded (Ramqvist 2007: 173). It is quite possible that the need for moose products among the farmers coincided with an expansion of the moose population during that time (due to a more favourable climate), making the pitfall traps extremely important. In this scenario, a large part of the moose products were to be traded, instead of forging the social and ritual foundation of the hunter community, as in the "early days." Maybe because of this, the animal never regained its ritual, symbolic or ideological status, even if moose once again became a major economic factor.

REFERENCES

Albon, S. D. & Langvatn, R. (1992). "Plant phenology and the benefits of migration in a temperate ungulate," *Oikos*, 65:3, pp. 502–513.

Almgren, O. (1911). "Ett karelskt stenvapen med älghufvud funnet i Uppland 1. Arkeologisk utredning" ['A Karelian stone weapon with moose head found in Uppland 1. Archaeological investigation'], *Fornvännen*, 1911, pp. 153–163.

Anderssson, S., Rosqvist., G., Blauw, M. & Wastegård, S. (2010). "Late Holocene climate change in central Sweden inferred from lacustrine stable isotope data," *Journal of Quaternary Science*, 25, pp. 1305–1316.

Aronsson, K.-Å. (1991). *Forest Reindeer Herding A.D. 1–1800. An Archaeological and Palaeoecological Study in Northern Sweden* (Archaeology and Environment 10), Umeå: Umeå University.

Ball, J. P., Lundmark, C., Ericsson. G., Wallin, K., & Danell, K. (in revision). "Bergmann's rule, Allen's rule, and snow. Testing hypotheses of geographic variation in moose morphology."

Barnekow, L., Bragé, P., Hammarlund, D. & St. Amour, N. (2008). "Boreal forest dynamics in north-eastern Sweden during the last 10,000 years based on pollen analysis," *Vegetation History and Archaeobotany*, 17, pp. 687–700.

Baudou, E. (1977). "Den förhistoriska fångstkulturen i Västernorrland" ['The prehistoric hunting culture in Västernorrland'], in *Västernorrlands förhistoria*, eds. E. Baudou & K.-G. Selinge, Härnösand: Västernorrlands läns landsting, pp. 11–152.

— (1978). "Kronologi och kulturutveckling i mellersta Norrland under stenåldern och bronsåldern" ['Chronology and culture developement in Middle Norrland during the Stone and Bronze Age'], in *Studier i norrländsk forntid* 1. *Till Ernst Westerlund 9 november 1975* (Acta Bothniensia occidentalis 1), ed. A. Huggert, Umeå: Västerbottens läns hembygdsförening, pp. 8–18.

— (1992). *Norrlands forntid* ['The prehistory of Norrland'], Höganäs: Wiken.

Bengtsson, P. G. (1993). "Hur gamla är de jämtländska fångstgroparna?" ['How old are the pit-fall traps in Jämtland?'], seminar paper, Mitthögskolan, Östersund.

Bergman, I. (1995). *Från Döudden till Varghalsen* ['From Döudden to Varghalsen'] (Studia Archaeologica Universitatis Umensis 7), Umeå: Umeå University.

Binford, L. R. (2001). *Constructing Frames of Reference. An Analytical Method for Archaeological Theory Building Using Hunter Gatherer and Environmental Data Sets*, Chicago: University of California Press.

Bjune, A. E., Birks, H. J. B. & Seppä, H. (2004). "Holocene vegetation and climate history on a continental-oceanic transect in northern Fennoscandia based on pollen and plant macrofossils," *Boreas*, 33, pp. 211–223.

Broadbent, N. (1982). *Den förhistoriska utvecklingen under 7000 år* ['The prehistoric development during 7,000 years] (Skelleftebygdens historia 3), Skellefteå: Skellefteå kommun.

Carpelan, C. (1977). "Älg- och björnhuvudföremål från Europas nordliga delar" ['Objects with moose and bear heads from the northern part of Europe'], *Finskt Museum*, 82, pp. 5–67.

Charman, D. J., Barber, K. E., Blaauw, M., Langdon, P. G., Mauquoy, D., Daley, T. J., Hughes, P. D. M. & Karofeld, E. (2009). "Climate drivers for peatland palaeoclimate records," *Quaternary Science Reviews*, 28, pp. 1811–1819.

Davis, S., Brewer, S., Stevenson, A. C. & Guiot, J. (2003). "The temperature of Europe during the Holocene reconstructed from pollen data," *Quaternary Science Reviews*, 22, pp. 1701–1716.

Ekholm, T. (2007). "Bastuloken. En osteologisk analys av benmaterialet från en stenåldersboplats i västra Ångermanland" ['Bastuloken. An osteological analysis of bones from a Stone Age settlement in western Ångermanland'], seminar paper in Osteology, Högskolan på Gotland, Visby.

Ekman, J. & Iregren, E. (1984). *Archaeo-zoological investigations in northern Sweden* (Early Norrland 8), Stockholm: Kungl. Vitterhets Historie och Antikvitets Akademien.

Engelmark, R. & Larsson, T. B. (2005). "Nämforsens ristningar nu fler än tvåtusen" ['The rock carvings at Nämforsen, now more than two thousand'], *Populär Arkeologi*, 4, p. 4.

Ericsson, G., Ball, J. P. & Danell, K. (2002). "Moose offspring body mass along an altitudinal gradient," *Journal of Wildlife Management*, 55:1, pp. 91–97.

Ericsson, G., Larsson, T. B., Rosqvist, G. & Jonasson, C. (2011). "Älgen flyr när klimatet ändras" ['Moose disappear when the climate changes'], *Miljötrender*, 4, pp 12–13.

Ericsson, G. & Wallin, K. (2001). "Age-specific moose *Alces alces* mortality in a predator free environment. Evidence for senescence in females," *Ecoscience*, 8, pp. 157–163.

Ericsson, G., Wallin, K., Ball, J. P. & Broberg, M. (2001). "Age-related reproductive effort and senescence in free-ranging moose *Alces alces*," *Ecology*, 82, pp. 1613–1620.

Ericsson, K. (1996). "De norrländska kvartsitspetsarna. En studie av deras datering och betydelsefunktion i det förhistoriska samhället" ['The north Swedish quartzite points. A study of their dating and function in prehistoric society'], seminar paper, Umeå University.

Fandén, A. (2002). *Schamanens berghällar. Nya tolkningsperspektiv på den norrländska hällsristnings- och hällmålningstraditionen* ['The shaman's rocks. New perspectives on the northern Swedish petroglyphs'], Nälden: Lofterud produktion.

Forsberg, L. (1985). *Site Variability and Settlement Patterns* (Archaeology and Environment 5), Umeå: Umeå University.

— (1988). "Bosättningsmönster vid Lule och Ume älv under bronsålder och förromersk järnålder" ['Settlement patterns along the Lule and Ume rivers during the Bronze and Pre-Roman Iron Ages'], *Arkeologi i Norr*, 1, pp. 51–101.

— (2001). "Keramiken från Råingetlokalerna" ['The ceramics from the Råinget localities'], *Tidsspår*, 2001, pp. 129–150.

— (2010). "The spread of new technologies in Early Fennoscandia. A view without borders," in *Transference. Interdiciplinary Communications 2008/2009*, ed. W. Østreng, Oslo; www.cas.uio.no/publications_/transference.php; access date 14 May 2012.

Fryxell, J. M., & Sinclair, A. R. E. (1988). "Causes and consequences of migration by large herbivores," *Trends in Ecology and Evolution*, 3, pp. 237–241.

Gurina, N. N. (1956). Гурина, Н. Н. *Оленеостровский могильник* (Материалы и исследования по археологии СССР 47) ['The burial ground at Oleneostrov (Materials and research in Archaeology in the USSR 47)'], Moscow & Leningrad: Izd. Akademii Nauk.

Halinen, P. (2005). *Prehistoric Hunters of Northernmost Lapland. Settlement Patterns and Subsistence Strategies* (Iskos 14), Helsinki: Suomen muinaismuistoyhdistys.

Hallström, G. (1960). *Monumental Art of Northern Sweden from the Stone Age. Nämforsen and other Localities*, Stockholm: Almqvist & Wiksell.

Hammarlund, D., Björck, S. J., Buchardt, B., Israelson, C. & Thomsen, C. T. (2003). "Rapid hydrological changes during the Holocene revealed by stable isotope records of lacustrine carbonates from Lake Igelsjön, southern Sweden," *Quaternary Science Reviews*, 22, pp. 353–370.

Hammarlund, D., Velle, G., Wolfe, B. B., Edwards, T. W. D., Barnekow, L., Bergman, J., Holmgren, S., Lamme, S., Snowball, I. F., Wohlfarth, B. & Possnert, G. (2004). "Palaeolimnological and sedimentary responses to Holocene forest retreat in the Scandes Mountains, west-central Sweden," *The Holocene*, 14, pp. 862–876.

Hansson, A. (2006). "The rock paintings at Flatruet. An archaeological survey," *Adoranten*, 2006, pp. 109–115.

— & Rathje, L. (1995/1996). "Den som gräver en grop åt andra" ['The one who digs a pit for others'], *Arkeologi i Norr*, 8/9, pp. 23–42.

Holm, L. (1991). *The Use of Stone and Hunting of Reindeer. A Study of Stone Tool Manufacture and Hunting of Large Mammals in the Central Scandes c. 6000–1 BC* (Archaeology and Environment 12), Umeå: Umeå University.

Hulthén, B. (1991). *On Ceramic Ware in Northern Scandinavia during the Neolithic, Bronze and Early Iron Age. A Ceramic-Ecological Study* (Archaeology and Environment 8), Umeå: Umeå University.

Huttunen, P. & Tolonen, M. (1972). "Pollen-analytical studies of prehistoric agriculture in northern Ångermanland," in *Palaeo-Ecological Investigations in Northern Sweden*, ed. P. Huttunen, Stockholm: Kungl. Vitterhets Historie och Antikvitets Akademien, pp. 9–34.

Janson, S. & Hvarfner, H. (1960). *Från norrlandsälvar och fjällsjöar* ['From Norrland's rivers and mountain lakes'], Stockholm: Riksantikvarieämbetet.

Jonsson, C. E., Andersson, S., Rosqvist, G. & Leng, M. J. (2010a). "Reconstructing past atmospheric circulation changes using oxygen isotopes in lake sediments from Sweden," *Climate of the Past*, 6:1, pp. 49–62.

Jonsson, C. E., Rosqvist, G. C., Leng, M. J., Bigler, C., Bergman, J., Tillman, P. K. & Sloane, H. J. (2010b). "High-resolution diatom $\delta^{18}O$ records, from the last 150 years, reflecting changes in amount of winter precipitation in two sub-Arctic high-altitude lakes in the Swedish Scandes," *Journal of Quaternary Science*, 25, pp. 918–930.

Jordan, P. (2008). "Tracking 'technological choice' amongst northern hunter gatherers," in *Archaeology of Settlements and Landscape in the North* (Vuollerim Papers on Hunter-Gatherer Archaeology 2), ed. A. Olofsson, Vuollerim: Vuollerim 6000 år, pp. 81–111.

Käck, J. (2009). *Samlingsboplatser* ['Aggregation sites'] (Studia Archaeologica Universitatis Umensis 24), Umeå: Umeå University.

Karlsson, H., Hörnberg, G., Hannon, G. & Nordström, E.-M. (2007). "Long-term vegetation changes in the northern Scandinavian forest limit. A human impact-climate synergy?" *The Holocene*, 17, pp. 37–49.

Kjellström, R. & Selinge, K.-G. (1994). "Fångst och fängsel" ['Trapping and traps'], in *Sveriges Nationalatlas. Kulturminnen och kulturmiljövård*, ed. K.-G. Selinge, Stockholm: Sveriges Nationalatlas, pp. 60–63.

Larsson, T. B. (2008). *Arkeologisk undersökning av Raä 158, Ådals-Liden sn, Ångermanland 2006* ['Archaeological excavation 2005 of Raä 158, Ådals-Liden parish, Ångermanland'] (UMARK 48), Umeå: Umeå University.

— (2009). *Arkeologisk delundersökning av boplatsvall, Raä 183, Ramsele sn, Västernorrlands län, 2009* ['Archaeological investigation of embanked settlement, 2009, Raä 183, Ramsele parish, County of Västernorrland'] (UMARK 52), Umeå: Umeå University.

— (2010a). *Arkeologisk delundersökning av boplatsvall, Raä 183, Ramsele sn, Västernorrlands län, 2010* ['Archaeological investigation of embanked settlement, 2010, Raä 183, Ramsele parish, County of Västernorrland'] (UMARK 58), Umeå: Umeå University.

— (2010b). "Människan och älgen vid Bastuloken. En delundersökt boplatsvall från neolitikum i Västernorrland" ['Humans and moose at Bastuloken. A partly excavated embanked Neolithic settlement in Västernorrland'], *Arkeologi i Norr*, 12, pp. 1–16.

— & Broström, S.-G. (2011). *The Rock Carvings at Nämforsen, Sweden. The Survey 2001–2003* (UMARK 62), Umeå: Umeå University.

Larsson, T. B., Grabowski, R. & Ericsson, G. (2009). *Arkeologisk delundersökning av boplatsvall, Raä 471:1, Sorsele sn, Västerbottens län, 2009* ['Partial archaeological excavation of embanked settlement, 2009, Raä 471:1, Sorsele parish, County of Västerbotten'] (UMARK 53), Umeå: Umeå University.

Larsson, T. B. & Olofsson, J. (2006). *Arkeologisk undersökning 2005 av Raä 158, Ådals-Liden sn, Sollefteå kommun* ['Archaeological excavation 2005 of Raä 158, Ådals-Liden parish, Sollefteå rural district'] (UMARK 43), Umeå: Umeå University.

Latour, B. (2005). *Reassembling the Social. An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.

Lindgren, B. (2001). "Hällbilder. Kosmogoni och verklighet" ['Rock art. Cosmogony and reality'], *Tidsspår*, 2001, pp. 43–81.

— (2002). "Hällmålningar. Ett uttryck för materiella och immateriella dimensioner" ['Rock art. An expression of material and immaterial dimensions'], in *Hällbilder & hällbildernas rum* (Studier i regional arkeologi 2), eds. L. Klang, B. Lindgren & P. H. Ramqvist, Örnsköldsvik: Regional Arkeologi, pp. 55–75

Lindqvist, A.-K. (2002). "Stenåldersboplatsen vid Kornsjövägen i norra Ångermanland" ['The Stone Age settlement at Kornsjövägen in Northern Ångermanland'], in *Hällbilder & hällbildernas rum* (Studier i regional arkeologi 2), eds. L. Klang, B. Lindgren & P. H. Ramqvist, Örnsköldsvik: Regional Arkeologi: pp. 77–86.

Lindqvist, C. (1994). *Fångstfolkets bilder. En studie av de nordfennoskandiska kustanknutna jägarhällristningarna* ['The hunters' pictures. A study of the north Fenno-Scandian coastal hunters' rock-engravings'] (Theses and Papers in Archaeology 5), Stockholm: Stockholm University.

Lofterud, K. (2005). *Älggropar* ['Moose pits'], Nälden: Lofterud produktion.

Lundberg, Å. (1997). *Vinterbyar* ['Winter villages'] (Studia Archaeologica Universitatis Umensis 8), Umeå: Umeå University.

Meinander, C. F. (1965). "Skifferknivar med djurhuvudskaft" ['Slate knives with handles with animal heads'], *Finskt Museum*, 71 (1964), pp. 5–33.

Ramqvist, P. H. (2007). "Fem Norrland. Om norrländska regioner och deras interaktion" ['Five Norrland. About Northern Swedish regions and their interaction'], *Arkeologi i Norr*, 10, pp. 153–180.

Rosqvist, G., Jonsson, C. E., Karlén W., Yam, R. & Shemesh, A. (2004). "Diatom oxygen isotopes in pro-glacial lake sediments from northern Sweden. A 5,000 year record of atmospheric circulation," *Quaternary Science Reviews*, 23:7–8, pp. 851–859.

Rosqvist, G., Leng, M. J. & Jonsson. C. E. (2007). "North Atlantic region atmospheric circulation dynamics inferred from a Late-Holocene lacustrine carbonate isotope record, northern Swedish Lapland," *The Holocene*, 17:7, pp. 867–873.

Runeson, H. (2007). "Den goda ordningen" ['The good order'], in *Stenålderns stationer. Arkeologi i Botniabanans spår*, eds. P. Gustafsson & L. G. Spång, Stockholm: Riksantikvarieämbetet, pp. 71–115.

Rydström, G. (1984). "The fire-cracked stone mound. A winter settlement," in *Papers in Northern Archaeology* (Archaeology and Environment 2), ed. E. Baudou, Umeå: Umeå University, pp. 75–86.

Selinge, K.-G. (2001). "Fångstgropar i Nämforsens uppland" ['Pitfall traps in the uplands of Nämforsen'], *Tidsspår*, 2001, pp. 153–186.

Seppä, H., Bjune, A. E., Telford, R. J., Birks, H. J. B. & Veski, S. (2009). "Last nine-thousand years of temperature variability in Northern Europe," *Climate of the Past*, 5:3, pp. 523–535.

Sher, A. V. (1987). "History and evolution of moose in USSR" (Proceedings of the Second International Moose Symposium, Uppsala [Sweden], 21–25 Aug. 1984), *Swedish Wildlife Research*, Suppl. 1:1, pp. 71–79.

Sjöstrand, Y. (2011). *Med älgen i huvudrollen. Om fångstgropar, hällbilder och skärvstensvallar i mellersta Norrland* ['With moose as the leading part. On pitfall traps, rock art and fire-cracked stone embanked settlements in Middle Norrland'] (Stockholm Studies in Archaeology 55), Stockholm: Stockholm University.

Spång, L.-G. (1981). "Fångstgropar. Lämningar efter forntida älgfångst" ['Pitfall traps. Remains of prehistoric moose trapping'], *Västerbotten*, 4, pp. 282–290.

— (1997). *Fångstsamhälle i handelssystem* ['Hunting community in a trading system'] (Studia Archaeologica Universitatis Umensis 9), Umeå: Umeå University.

St. Amour, N. A., Hammarlund, D., Edwards, T. W. D. & Wolfe, B. B. (2010). "New insights into Holocene atmospheric circulation dynamics in central Scandinavia inferred from oxygen-isotope records of lake-sediment cellulose," *Boreas*, 39, pp. 770–782.

Stearns, S. C. (1992). *The Evolution of Life Histories*, Oxford: Oxford University Press.

Steward, J. H. (1955). "The concept and method of cultural ecology," in *Theory of Cultural Change. The Methodology of Multilinear Evolution*, J. H. Steward, Urbana: University of Illinois Press, pp. 30–42.

Storå, J., Strand, L. & Fridén-Rolstadaas, M. (2011). *Osteologisk analys av obrända och brända skelettfynd från stenålderslokalen Bastuloken Raä 183, Ramsele sn, Västernorrlands län* ['Osteological analysis of unburnt and bunt skeleton findings from the Stone Age site Bastuloken, Raä 183, Ramsele parish, County of Västernorrland'] (Rapport 2011:10), Osteologiska forskningslaboratoriet, Stockholm: Stockholm University.

Tilley, C. (1991). *Material Culture and Text. The Art of Ambiguity*, London: Routledge.

Väliranta, M., Korhola, A., Seppä, H., Sarmaja-Korjonen, K., Tuittila, E.-S., Laine, J. & Alm, J. (2007). "High-resolution reconstruction of wetness dynamics in a southern

boreal raised bog, Finland, during the late Holocene: A quantitative approach," *The Holocene*, 17, pp. 1093–1107.

Velle, G., Brooks, S. J., Birks, H. J. B. & Willassen, E. (2005). "Chironomids as a tool for inferring Holocene climate. An assessment based on six sites in southern Scandinavia," *Quaternary Science Reviews*, 24, pp. 1429–1462.

Zhul'nikov, A. M. (2006). Жульников. А. М. *Петроглифы Карелии. Образ мира и миры образов* ['Petroglyphs of Karelia. World picture and the worlds of the pictures'], Petrozavodsk: Skandinavia.

JOURNAL OF NORTHERN STUDIES Vol. 6 • No. 1 • 2012, pp. 31–51

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Baltic State Migration System

The Case of Latvian Immigrants in Sweden

ABSTRACT The article focuses on the migration from the Baltic States to Sweden, with a particular focus on Latvia. Two historical turns in the Baltic States' recent history have contributed to an out-migration from the region—the restoration of independence in the early 1990s and accession to the European Union (EU) in 2004. Although these events were considered positive as they meant "open" borders for Baltic State citizens, lately the out-migration from Latvia has increased. Likewise, the global economic crisis that started in 2008 and the consequential unemployment draw attention to emerging patterns and the composition of emigrants to several destinations, but in this case particularly to Sweden. After the EU expansion Sweden did not receive as many Eastern European migrants as was expected at the time, but recent trends reveal that there has been a steady increase in the migration flow since then. The Nordic countries as a potential destination initially lacked pioneer migrants to establish social support networks that would attract newcomers, but this is now changing; statistics for 2010 show that the number of Baltic State immigrants in Sweden has grown significantly since 2008. With the economic recession and unemployment in Latvia in 2009, 2010 had even higher emigration activity than in 2004 just after the country's accession to the EU. Nordic countries emerge as welcoming destinations to recent migrants, who state that the proximity to their home country and the labour market opportunities are the main attraction but also that a positive view of Sweden and the Swedes plays a part. Contemporary trends of migration from the Baltic States and especially Latvia under conditions of economic downturn lead to emerging pattern of migration systems between Latvia and Sweden, combining a mixture of motives and diversity of the people involved in migration chains.

KEYWORDS international migration, east-west migration, Latvian emigration, Baltic, migration system

Introduction

Despite the geographical proximity between the Baltic countries and Sweden as well as their historical links, migration streams are at a low level, as a result of the political barrier between the Soviet Union and the Nordic countries during the post-war period. In the early 1990s there were indications of an emerging migration system evolving between the countries around the Baltic Sea (Olofsson & Malmberg 2010). With the 1991 dissolution of the Soviet Union contact between the Nordic countries and the Baltic States was restored, for instance regarding restitution (Jörgensen & Stjernström 2008), and the establishment of Swedish companies in the Baltic States. This contact intensified after the expansion of the EU and the inclusion of new member states. In more recent years, the economies of the Baltic States have been severely struck by global recession. These historical events have shaped a migration system. In this article we focus on the migration between the Baltic States in general, and Latvia in particular, to Sweden.

According to Wadensjö (2007), since May 2004 Sweden as a destination has experienced increasing immigration, especially from Poland and the Baltic States, albeit not to the expected extent (Tamas & Münz 2006; Drinkwater *et al*. 2009; Olofsson & Malmberg 2010). Despite the geographical proximity and historical bonds, and the fact that Sweden did not apply transitional rules for migrants coming from the new EU member states, migration flows from Poland and the Baltics have become much greater to other destinations, for instance Ireland and the UK (Apsite 2011). According to Kahanec *et al*. (2009), almost 70 per cent of the immigrants from the EU8[1] have been absorbed by the UK and Ireland since 2003. A survey carried out in the Baltic countries a few years before the EU accession shows that the willingness to move abroad was not very high, and at the time few respondents had Nordic countries (including Sweden) as their preferred destination. Potential migrants more often choose Ireland and the UK due to easier access to the labour market in these countries and not least the fact that English is the language spoken there (Wadensjö 2007). Apsite (2011) reports that most Latvian migrants to Ireland and the UK migrate for economic reasons and tend to work in low-paid sectors.

For the Baltic States, access to the European common labour market has resulted in a negative net migration to countries with relatively higher wages. By the year 2000 net migration rates had turned positive in most EU10 new member states, and in 2005 the migratory balance was positive in all member states except Latvia, Lithuania, Poland and the Netherlands (Diez Guardia & Pichelmann 2006).

Looking at recent emigration from the Baltic States, the immigration of men has increased rapidly since 2004 although there are still more female than male immigrants (Wadensjö 2007). A noteworthy aspect of this new emigration pattern is also that the composition of immigration from the three Baltic countries (Estonia, Latvia and Lithuania) to Sweden went through a change, with Estonian immigration—previously always the largest group of the three—significantly surpassed in volume by Lithuanian immigration (Olofsson & Malmberg 2010). In this paper we focus on Latvian migrants, a group that has also grown faster than the Estonian migrants during the past decade.

The aim of this study is to explore how the migration system between Sweden and the Baltic States developed over time in relation to the structural changes (independence, EU expansion, economic crisis). In addition, we also aim to study the motives and experiences of immigrants who have come to Sweden from Latvia.

This study addresses several research questions:

- How are historical events like independence restoration and accession to the EU reflected in migration inflows to Sweden from the Baltic States?
- Are there significant differences in the volumes and composition of Baltic State immigrant in Sweden at different stages?
- What are the main motives and reasons for Latvian women and men for choosing Sweden as their destination?

Theoretical Background and Previous Research

Human mobility has become an inherent part of the global economy. As a social and economic process, globalization prompts a "proliferation of cross-border flows and transnational social networks" (Castles 2001) that connect migrants across transnational space. In a rapidly globalized world, the patterns of migration and migrants' social relationships are changing fast. Migrants move in what are called "transnational social spaces," which are the preconditions for and also the products of globalizing processes (Faist 2000). Migration is a significant event in the individual migrant's life; it is not something undertaken lightly, without seriously considering its consequences (Lee 1966; Fielding 1992; Niedomysl 2010). According to Halfacree (2004) migration is a complex process, and besides previously dominant economic motives there are various non-economic factors such as family ties, amenities and cultural aspects that have been suggested as important

in understanding migration processes (Bailey & Boyle 2004; Bengtsson & Johansson 1993; Hedberg & Kepsu 2003; Lundholm 2007).

Neo-classical economic models of migration generally assume that individuals will choose to migrate permanently only if they receive a higher real wage in the receiving country than in the sending country (Massey *et al*. 1993). The labour demand in Sweden is an important attraction for Latvians, and the relationship between the Swedish and Latvian labour markets could be seen as an example of dual labour market theory (Piore 1979); migration flows are largely determined by labour demand characteristics at the destination, where the local population moves to more attractive professions while immigrants take up the "3D" (dirty, dangerous and difficult) jobs (Favell 2008). Kahanec *et al*. (2009) stress that migration theories generally imply the significance of international differentials: net of migration costs in earnings and income levels; costs of living; unemployment rates; the quality of public goods; and the generosity of the welfare systems. This is often the case when characterizing mainly economic-driven connections between countries, but it is recognized that there is a strong association between permanent settlement and family reunification (Massey & Espinosa 1997) as well as intermarriage with natives.

Irrespective of motive, economic or otherwise, migrants may be positively or negatively self-selected with respect to their observable and unobservable characteristics, upon both entry and exit (Borjas 1987; Chiswick 1999; Kahanec *et al*. 2009). There seems to be an increasing consensus in the migration literature that, instead of being an aspect of income-maximizing behaviour by individuals, migration is often an aspect of livelihood strategies pursued by households to spread income risks and, if possible, generate income (remittances) which can be used to improve living standards or invest in housing, education or commercial enterprises. Migration then becomes a strategy to overcome the local market and other more general development constraints (Stark 1991; de Haas 2010). According to Massey and Taylor (eds.) (2004), the effects of (labour) migration are becoming increasingly multifaceted, for both the sending and receiving countries. However, in the case of the Baltic States more negative effects, like a loss of the economically active population, are recognized in the countries of origin more than in the receiving country. Furthermore, according to Salt (1987), people tend to move to places where the standard of living is better. However, this alone cannot explain the actual shape of migration patterns (Salt 1987: 243; Schoorl 1998) because, as argued by Meng and Gregory (2005), in most Western countries immigrants earn less on average, than the native-born, an earning gap that decreases as time spent in the host country increases.

In the literature there are several definitions of temporary and perma-

nent migration. According to Berninghaus and Siefert-Vogt (1988), a migrant typically only plans a temporary stay in the host country, but actually postpones the date of return such that return migration becomes less probable after some time. According to Piore (1979), a guest worker or temporary migrant is a target saver who knows exactly how much capital s/he needs. Permanent migrants, on the other hand, are the ones who change their place of residency. Pinger (2009) explains that they intend to "settle abroad" and do not want to return to their home country on a continuous basis. Temporary migrants are those who have spent no more than a year abroad or do not intend to stay longer and plan instead to return home for good.

Little existing research deals with the characteristics of permanent and temporary migration (Pinger 2009). Dølvik and Eldring (2006) characterize the case of the Nordic countries as having a modest inflow of individual job seekers, but with a current sharp increase in the posting of workers and low-cost competition from Poland and the Baltic States.

In the case of Sweden, Dølvik and Eldring (2006) explain that there is growing interest in the posting of workers in Sweden for often temporary, low-skilled occupations that include lower costs and enhanced flexibility. Although there are no reliable statistics on the volume and composition of this mobility, most of the service migration takes place through the posting and hiring out of workers, although self-employment is also prevalent. The main flows are found in the construction industry, but an increased use of subcontractors and hired labour from the EU8 is also reported in the manufacturing, service and agriculture/horticulture/forestry industries.

Besides the economic drivers, social motives—particularly intermarriage—can be an important component in understanding a migration system. In the literature, intermarriage is considered a major indicator of the quality of the relationships, or "social distance," among groups and the "cohesion" of societies (Monden & Smits 2005). In describing the east-west migration of Bulgarian females, Lalioutou (2010) discovers that they were driven by a variety of factors, including the need for better material and professional resources, political and existential dissidence, personal and intimate relationships, love, curiosity and desire. As Mahler and Pessar (2006: 27) argue, migrant women are generally more likely than men to develop personal and household strategies consistent with long-term or permanent settlement abroad. A considerable proportion of all Baltic immigrants, especially women, engage in intermarriage with Swedish men. According to Niedomysl *et al*. (2010), immigrant women from Russia and the Baltic States are a relatively new phenomenon in Sweden (since the fall of the Iron Curtain) in terms of intermarriage with Swedish male partners, compensating for the now much lower volumes of Polish women, who were the majority

group during the 1970s and 1980s (Niedomysl *et al*. 2010). In contrast, other findings by Meng and Gregory (2005) on intermarriage in Australia show that male rather than female immigrants are more likely to intermarry. Intermarriage with the host country population has long been considered vital to immigrants' societal (Dribe & Lundh 2008) integration and economic assimilation, which are generally understood to be an accumulation of the knowledge of the customs, language and opportunities to find good jobs in the host country (Chiswick 1978; Meng & Gregory 2005).

The probability that an immigrant will intermarry may also be affected by the length and permanency of his or her residency in the host country. Therefore, male Baltic State immigrants—who are often involved in temporary single or repeated economic migration moves—do not identify as much with the host society, or more often maintain transnational relationships. Meng and Gregory (2005) found evidence that immigrants who have been in the host country for a longer period may have a better understanding of the culture there than more recent arrivals and may therefore relate better to potential spouses from the set of available natives. In addition to a better understanding of the culture, Fischer and Malmberg (1998) and Bevelander (2000) found an improved labour market position for East European migrants with longer durations of residence in Sweden (Olofsson & Malmberg 2010). As a general observation, Rauhut (2004) argues that immigrants from Eastern Europe can be integrated into Swedish society more easily than those from more distant locations. Although empirical findings show great differences between the labour market performances of East Europeans and native Swedes (Bevelander 2000; Olofsson & Malmberg 2010), there are a number of highly skilled professionals from the Baltic States living and working in Sweden. This opportunity provides a field for professional career growth.

As found by Baker and Benjamin (1997), immigrant women from an intermarried family do better on the labour market than their counterparts from a non-intermarried family. The authors interpret this phenomenon as an outcome of an investment strategy that differs according to family type (Meng & Gregory 2005). Because females who move to Sweden for marriage may face various different obstacles (Olofsson & Malmberg 2010), they can quickly develop new contacts in the new country, but marriage migration often results in relative isolation, as contact with other immigrants from the same country may not be as frequent. Initial or pioneer migrants in this context create an attractiveness of a destination; therefore the circulation of migrants, both those who are well-educated and others and in both temporary and permanent systems, is crucial for triggering increases in migration, for the diffusion of information about the place of destination, and

for the success of previous migrants by also possibly functioning as a good example for potential followers (Gurak & Caces 1992; Faist 2000). Thus, networks may serve as a key element in facilitating community formation and permanent settlement (Portes 1995).

Data and Methods

This study is based on two sources of data, Swedish register data and a web-based survey exploring Latvian citizens currently living in Sweden. The register data deals with the characteristics of Baltic State immigrants in Sweden based on time-series and cross-sectional data. The data was extracted from the ASTRID database at the department of Geography and Economic History at Umeå University. The data set includes information on an individual level on demographic and socio-economic characteristics of all people born in the Baltic States residing in Sweden, as well as all those who migrated from the Baltic States to Sweden between 1985 and 2008. In order to be registered as a permanent immigrant in Sweden and appear in the data set, a person must have an intention to stay in Sweden for more than one year. The analysis includes descriptive statistics analysing trends and composition, intermarriages and occupational clustering of the Baltic State immigrants in Sweden. Furthermore, four years were chosen for the cross-sectional part of the study: 1985, as this is the first year of data available that represents the Baltic State immigration activity during the Soviet period; 1991, representing the independence restoration; 2005, showing the changes taking place after accession to the EU in May 2004; and finally, 2008, representing the latest composition of Baltic State immigrants in Sweden. In addition, we looked at available statistical data for 2009, which revealed the current situation linking the Baltic State region and Sweden. A lack of sufficient data forced us to exclude temporary migrants from this study.

The qualitative part of this study deals with Latvia in particular. In order to understand immigrant experiences in Sweden, this part of the study discusses results from a web-based survey combined with more in-depth questions. Data from 122 respondents was collected via a locally popular Latvian social website, www.draugiem.lv. Data collection took place in October 2010 and was designed and distributed electronically. Various issues like motives and actual reasons for moves, social contacts, occupational changes, communication channels with Latvia and other Latvians in Sweden were addressed in 19 questions, and individuals were invited to participate through the website's discussion board and those who were located in Sweden at the time were then individually contacted via the website. However, participants themselves chose whether to complete the survey;

therefore self-selection has to be taken into account. This study thus concentrates on individual-level experiences of Latvians in Sweden.

The website contains a primary audience of around 2.6 million registered website users, composed of both people living in Latvia and Latvians living abroad. The foreign location is identified by the user's IP address.[2] At the end of 2010, the estimated count of website visitors in Sweden was around 1887[3] per day. This social website for individuals living abroad is a virtual connection point with their families and friends back home.

The combination of the two sources enables us to describe the general trends and development, but also to obtain insight from the perspective of the migrants.

Results

Baltic State Immigrants in Sweden. General Description

The official Swedish registers allow us to follow individual immigrants born in the Baltic States and migrating to Sweden from 1985 to 2008. It reveals a steady increase in Baltic State immigrants during this period, starting at a very low level. Data from 1985 reveals that as few as 34 people emigrated from all the Baltic States to Sweden that year. However, in that year 16,050 people born in the Baltic States already resided in Sweden, a group consisting mainly of immigrants who had come until the end of the Second World War. In the year of independence restoration, 1991, the number of immi-

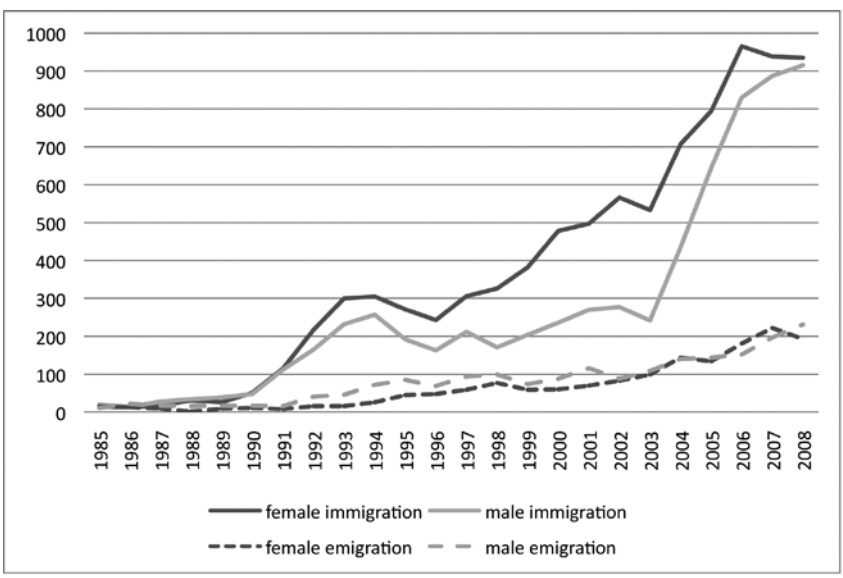

Fig. 1. Migration trends between the Baltic States and Sweden, 1985 to 2008 (source: ASTRID).

grants increased to 224. In 2005, the year after the Baltic States' accession to the EU and entrance onto the free European labour market, the number of immigrants from the Baltics to Sweden increased to 1,438. As many as 1,850 Baltic State immigrants arrived in Sweden in 2008. Furthermore, data from Statistics Sweden show that there was an even higher number of immigrants the following year in 2009, reaching 2,620. Also according to Statistics Sweden, in 2010 there were 21,431 persons born in Latvia, Estonia and Lithuania living in Sweden.

Fig. 1 shows a wave pattern with peak points of immigration at the beginning of the 1990s and after 2004. However, Baltic State citizen emigration from Sweden has remained fairly steady, with only a slight increase during all the included years.

There are slightly different immigration trends for Baltic State male and female immigrants (see Fig. 1). Until independence restoration the numbers of immigrants, both women and men, were rather equal. To some extent, the immigration trends reflect historical events like independence and EU membership. Immigration increased during all periods, peaking in 1993 and 2008. Since 1990 there have been more female than male immigrants from the Baltics to Sweden. It is worth noting that although women outnumber men, the emigration numbers are much more similar, suggesting that women have historically been more prone to stay. Fig. 1 shows a gradual and consistent increase of female immigrants, while the pattern in the Baltic States is one of sharp increase after the EU expansion. By 2004, the rate of

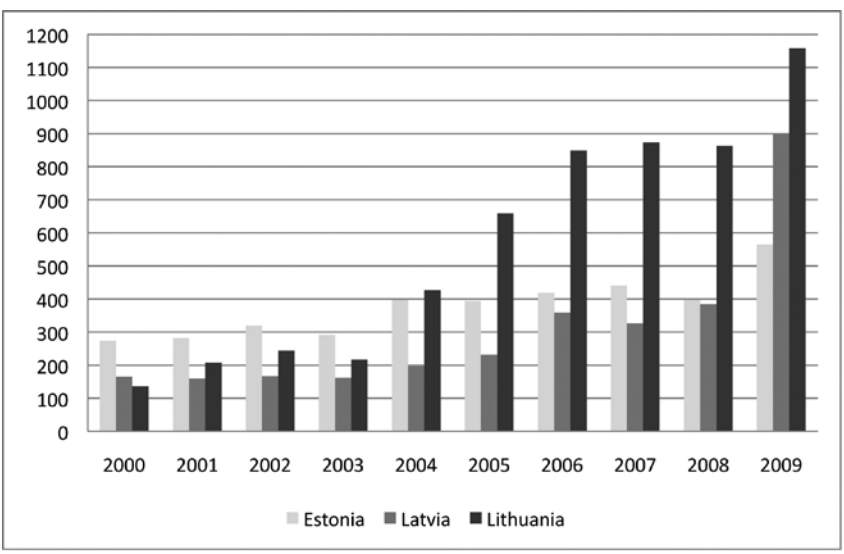

Fig. 2. Number of immigrants from Estonia, Latvia and Lithuania to Sweden between 2000 and 2009 (source: Statistics Sweden).

male immigrants had started to increase faster than that of females and the numbers had converged.

As shown in Fig. 2, Estonian migrants used to be the dominant group of Baltic immigrants in Sweden, but this trend has changed. After 2004, when all three countries joined the EU, Lithuanians became the dominant group in numbers, despite being the most remote in terms of geographic location but greatest in population. We also recognize another shift, in comparison to the neighbouring countries: Latvia experienced a sharper increase in emigration to Sweden starting in 2008 compared to the other Baltic countries. This can mainly be explained by the effects of the economic downturn, uncertainty and constraints in economic development.

There is also a significant change in immigrant age composition over time, shown in Fig. 3. There was a fairly equal distribution by gender in 1991, when nearly 40 per cent of registered immigrants in Sweden from the Baltic States were under age 20 (1985 is excluded from this analysis as there are too few observations). By 2005 the age composition had changed, and now the significantly dominant group for both genders were immigrants aged 21 to 30 years followed by males aged 31 to 40 and children up to ten years old. The age composition of Baltic State immigrants in 2008 does not differ significantly compared to 2005; however, there are considerably more male immigrants in the 21–30 age group. In both 2005 and 2008 an increase of economically active working-age Baltic State citizens moving to Sweden

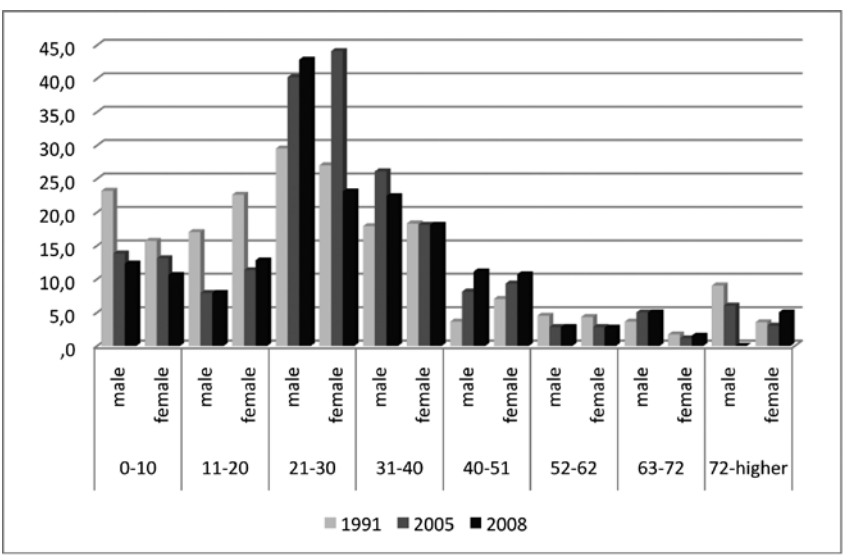

Fig. 3. Age structure of Baltic State immigrants in Sweden in 1991, 2005, 2008 (per cent) by gender (source: ASTRID).

is noteworthy, suggesting that Sweden, after being recognized as a potential destination, has attracted individuals often enticed by economic motives and higher prosperity potential.

The web-based survey data from 2010 describing Latvian immigrants in Sweden is in line with these findings, and the age group composition among respondents is dominated by the 20–30 year age group. The main motive for men was economic and for women family reunification. These results are in contrast to those found in similar research conducted at the University of Latvia targeting Latvian immigrants in the UK, in which work and family motives were not gender-related. Both male and female migrants initially migrate with economic motives but further social network expansion attracts more followers with family motives.

Marriage to Co-Ethnics or Swedes?

An indication of different motives by gender, in the case of Sweden, was also found in the register data. Niedomysl *et al*. (2010) also found that females from the Baltic States and Russia more often marry Swedish males, compared to Baltic males marrying Swedish women. This finding is also confirmed in the present study. Another motive for migration to Sweden is family reunification with co-ethnics.

We have compared partner's country of birth (Baltic States or Sweden) for immigrants who immigrated in 1991, 2000, 2005 and 2008 after a period of three years, respectively, for 1994, 2003 and 2008. For people who arrived in 2008, the same year was used as the year of reference as this was the latest data available.

Most immigrants are young and unmarried (see Fig. 1). Baltic State women intermarry and choose relocation to Sweden more often than men do. This finding in our analysis was confirmed through a Chi-square test, in which we found a statistically significant difference between genders in terms of intermarriages for people who immigrated in 2000, 2005 and 2008 and have spent three years in Sweden (see Table 1). For the first period in the early 1990s, gender differences were not statistically significant. In general more men tend to have co-ethnic partners, but the Baltic State women—notably in the 20–30 year age group—tend to migrate single or in a relationship with Swedish men. Among the women who entered Sweden in 2000 and were married three years later, the majority were married to Swedish men. However, intermarriage does not seem to have increased in more recent years. Among those who entered Sweden in 2005, the most common origin of their spouses was the Baltic States.

Besides family reunification or family formation with a Swedish partner, another strong migration driver is economic motives. This is confirmed

	Civil status 1994 for immigrants (age >18) arriving 1991		Civil status 2003 for immigrants (age >18) arriving 2000	
	Men	Women	Men	Women
Not married	38 (51 %)	49 (58 %)	101 (70 %)	219 (56 %)
Married to Swedish	4 (5 %)	6 (7 %)	18 (12 %)	98 (25 %)
Married to Baltic	25 (34 %)	25 (30 %)	14 (10 %)	16 (4 %)
Married to other	7 (9 %)	4 (5 %)	12 (8 %)	59 (15 %)
Total	74 (100 %)	84 (100 %)	145 (100 %)	392 (100 %)

	Civil status 2008 for immigrants (age >18) arriving 2005		Civil status 2008 for recent immigrants (age >18)	
	Men	Women	Men	Women
Not married	319 (61 %)	360 (57 %)	598 (78 %)	546 (70 %)
Married to Swedish	11 (2 %)	77 (12 %)	10 (1 %)	36 (5 %)
Married to Baltic	148 (28 %)	121 (19 %)	126 (17 %)	133 (17 %)
Married to other	42 (8 %)	72 (11 %)	29 (4 %)	63 (8 %)
Total	520 (100 %)	630 (100 %)	763 (100 %)	778 (100 %)

Table 1. Adult (>18 years) Baltic State immigrants' intermarriages three years after immigration in 1991, 2000, 2005 and 2008 by gender (source: ASTRID).

in the web-based survey, which indicates that around half of the Latvian respondents came to Sweden due to economic motives, especially young males. In Sweden as well as the UK (Apsite 2011) economic reasons for migration have surpassed private reasons, a change that took place after the EU expansion, which offered increased employment options. Similar to the UK, Sweden's Baltic State immigrants are concentrated in low-skilled primary or secondary service occupations throughout the research period. In addition, however, there is a rather high number of highly skilled professionals working, for example, in education and engineering. Data from 2008 illustrates this, with the construction sector being the largest for men and the cleaning sector the most common for women. It is worth mentioning that this is a representation of the Swedish official statistics and carries a certain bias regarding the number of employed people, as we exclude temporary

immigrants who stay in Sweden less than a year as well as undocumented immigrants and those who are officially employed by companies based in the Baltics. The web-based survey data reveals similar characteristics in the ASTRID data, in which Latvian immigrants in Sweden are employed in both highly skilled occupations and low-skilled labour work. Results from the web-based survey among 122 respondents reveal occupations and sectors for employment that are mentioned more often—in Latvia these are students, project managers, construction workers, shop assistants and employees in the service sector, and in Sweden they are construction workers, students, the self-employed and those working in the service sector as well as those who are currently not working. The most common occupational transfer within the same occupation involves students, construction workers and employees in the service sector. A high number of those not working or currently unemployed can be explained by the number of young women who move to Sweden to establish families with Swedish partners or reunite with their co-ethnics. Thus, maternity leave and homemaking are common occupations. However, results from similar research on Latvian immigrants in the UK (Apsite 2011) show more dramatic differences between occupational changes in Latvia and the UK, and that most immigrants hold low-skilled jobs and only an insignificant number work in highly skilled occupations. Even though a move to the UK would seem easier in terms of language and migrant network support, as a destination Sweden seems to have a tendency to attract more skilled and highly motivated immigrants.

Experiences of Latvian Immigrants in Sweden

We have identified two dominant motives behind Latvian immigration to Sweden: in the web survey, slightly less than half of the respondents place themselves in the economic migrant group and almost as many have moved to join their family members, both those of Latvian origin and Swedish partners. In addition to these two dominant groups there are also adventure-seekers and students. The web-based survey includes 73 female and 49 male Latvian immigrants, aged 18 to 66, in Sweden. The highest proportion of respondents represents the 20–40 year age group, with the highest peak at 25–26 years of age. The length of stay in Sweden varies. More than half of the respondents have been in Sweden for more than a year and are considered permanent migrants. However, just below half have been in Sweden for less than a year, and even though they express a wish to be living in Latvia in five years, most of them believe that this will not be possible and that they will remain in Sweden.

The web survey reveals several rather different reasons for choosing Sweden as a target destination, and this decision has often been carefully

thought through because the Swedish language adds constraints for new immigrants to overcome. There may be very different motives, including very general ones like "I wanted to try how it would be to live abroad," mostly expressed by young respondents. In terms of destination choice, geographic proximity plays an important role, with immigrants stating that "Sweden is much closer in distance than the UK and Ireland." There are also very subjective positive emotions concerning Sweden:

> My dream since childhood was to study in Sweden, because I really like the Swedish culture and mentality. Before moving to Sweden I visited here a few times and since then I have really loved this country.

Proximity to home, labour market opportunities and a positive image promote Sweden as a potential destination for immigrants with various backgrounds. Sweden is not only a destination offering low-skilled jobs with Latvians massively contributing to a process of brain drain, but is rather viewed more as providing opportunities for them to secure better life conditions for themselves and their families.

Do Latvians Move to Sweden for Work?

As the unemployment rate in Latvia increased from 10 per cent in 2008 to 17 per cent in 2010, employment opportunities or "escape" from unemployment are expected to have been reinforced as a motive for moving to Sweden. As expressed by a male construction worker (38):

> Sweden is the best country in terms of work and attitude towards guest workers. Here you have to prove yourself and if you're a good construction worker you'll always have work to do. Swedes prefer that a person speaks bad Swedish rather than good English, so that's one of the investments I had to make to be able to work here. Yes, work, because I'm here with my colleagues from Latvia and my family lives back in Latvia. I'm very satisfied with the work and living conditions here, as are the others I know. Most probably I won't be going back to Latvia in the next five years—only if there's more or less appropriate employment and wage level in Latvia.

Changes in occupation after changing the place of residency, however, are not as dramatic as in the case of Latvians in the UK (Apsite 2011). There are significant differences between a respondent's occupation in Latvia before emigration and the occupation held in the UK. Nine out of ten Latvian immigrants in the UK are working in low-skilled jobs, mostly in agriculture and picking-packing factories (Apsite 2011), compared to the results of the web-based survey in Sweden in which more often respondents re-

ported occupational transfers in sectors like IT, education, engineering, forestry, medicine and construction. Persons with work-related motives are mostly male respondents. The actual reasons are rather different, varying from business trips or employment in Sweden through employers in Latvia. However, the most common reasons for moving are still unemployment, loss of job in Latvia or a need for financial resources. As this quotation from a woman now working in various jobs within agriculture reflects:

> As a teacher, I didn't have work anymore. The salary I was making wasn't even enough for my daily trips to work. I'm a single mother with two sons, six and eight years old.

A similar quotation reflects the struggle of dealing with monthly payments: "I had to move because I had to make my mortgage payments, and back in Latvia I couldn't find employment for a long period."

The latest economic crisis in Latvia has caused many, both male and female informants, to consider economic moves. The following quotation illustrates teachers' lack of opportunities in Latvia and the decision to move to Sweden and work as a teacher there:

> I had a big study loan to pay back, and in my profession [primary school teacher] in Latvia I couldn't find a well paid position and Sweden is close to Latvia and has a good economy as well as a positive social and emotional environment.

Along the same lines, the following example illustrates a position change from being a highly qualified project manager in Latvia to working in a construction field in Sweden:

> After our economic boom years it's impossible to survive with today's ridiculous salaries. And the state isn't even on my side: from my salary of 1,500 lats I receive only 390 lats, which is very disappointing. What else can I do? I have to move and work abroad!

Although Sweden is perceived by many migrants as an attractive country to live in, most of the Latvians participating in the survey stated that they would like to return to Latvia but that there are obstacles that make them believe they will not be able to do so within the near future.

Do Latvians Move to Sweden for Family Reasons?

The second main group of people with motives similar to those in the UK study are respondents who have moved to Sweden to join their family members already living there. The results reveal that women from Latvia often

move to Sweden because of intermarriage with Swedes. Women often mention that they "mainly had private reasons;" "there was nothing negative that pushed me away from Latvia." In these cases no economic push factors determined their decision to move; on the contrary, many of them faced a hard decision in order to make their relationship work:

> I had only private reasons—I met a Swedish guy and we understood that if we wanted to be together I would have much higher chances of succeeding in Sweden than he would in Latvia.

Or a quotation from a woman who lived under very good conditions in Latvia and had a well-paid job at a prestigious company: "The reason I moved was my husband, who is from Stockholm."

One of the interviewees is certain that "Swedish men are more serious and responsible about family values and children," therefore Latvian women often intermarry with Swedish male partners. Alongside intermarriage and permanent settlement in Sweden, social networks that are maintained between Sweden and Latvia can attract potential new immigrants:

> My sister is married to a Swede and has lived here since 2000, and we decided that life in Sweden is better for work and studies, so I moved to Sweden as well.

Social ties have a very wide range of possible followers, starting with underaged children at the time of the move: "My mum married a Swede and I came with her." The older generation is more often welcomed by their children: "Back in Latvia my life conditions were average, but my daughter is married to a Swede and lives in Sweden, so I came to live with her."

For those who choose Sweden due to the free education available to EU member state citizens, the length of stay in Sweden may gradually and naturally change from one semester to a permanent stay and settlement. As a country, Sweden appears to be strategically interested in highly skilled professionals and attracts them through various benefits. A man who came to Sweden as a forestry student says:

> I was noticed at my university in Latvia, and applied for the IKEA scholarship for master studies in Sweden. The rest just came in addition to that, and after spending some time here I realized that this was the place where I wanted to develop myself.

Latvian student migrants in Sweden are young people who are not planning to work in low-skilled occupations but rather to find opportunities to gain knowledge and experience. However, there is no certainty regarding return

plans, as Sweden currently offers wider development. And as these migrants are mostly in the young adult category, initial study motives may in time change into permanent settlement with subsequent prevailing motives.

Discussion

The background of this study is the discussion about Eastern Europeans moving to the West; more precisely, the Baltic States as a region of emigration and emerging new receiving countries being not only English speaking, but also others. In a historical context the Nordic and Baltic hemispheres are closely interrelated, only interrupted by a cold war that occasionally divided Europe into two separated parts. This was quite noticeable in the northern context (Nordic and Baltic countries). The present study could also be understood as a study of the normalization of the migration patterns in this northern hemisphere.

Citizens of the Baltic countries have enjoyed free movement and travel only since the beginning of the 1990s, and have had access to significant opportunities to work abroad without institutional restriction since 2004 when all three Baltic States entered the EU. A more recent economic downturn has affected many Baltic State citizens, as economic conditions in the countries of origin deteriorated and many chose to move abroad to find employment. Sweden and the Nordic countries in general, has long been a destination for citizens from across the Baltic Sea. But recent historical events have accelerated a rapid increase in emigration from Lithuania, Latvia and Estonia to Sweden, and the migrant composition has converged in terms of motives and gender.

Swedish statistics reveal that there has been a massive increase in officially registered immigration, from very low in-migration numbers in 1985 to around 2,600 immigrants from the Baltic States in 2009. In addition to this permanent migration, there are also temporary and undocumented labour immigrants who are unaccounted for. The composition of the Baltic State immigrants differs significantly when comparing certain years. In terms of volume, since the early 1990s Sweden as a destination has been more attractive to female than to male immigrants. This shifted in 2003, however, when men's immigration increased more quickly than women's; this coincides with the opening of the free EU labour market. In recent years there has been a rapid increase of young, working-age, male immigrants who regard themselves as economic migrants more often than females do. The increased migration of this group has thereby evened out the gender imbalance in more recent years.

Results show adverse gender composition when comparing economic

and family reunification groups. With reference to results from the ASTRID database, male respondents are far more frequently represented in the economic labour migrant group and female respondents are strongly represented in the family reunification group. This means both that females are more involved in relationships with Swedes and also that Latvian males come to work in Sweden and, after settling in, invite their families from Latvia to join them. This is also confirmed by Niedomysl *et al*. (2010), who find that immigrant women from Russia and the Baltic States are a relatively new phenomenon in Sweden and are surpassing the previous dominance of Polish women. Sweden as a potential destination is becoming attractive and accessible through the development of social networks, and Latvian immigrants are eager to learn the language and overcome bureaucratic constraints to being successful.

In addition to employment opportunities another family-related group, family reunification and intermarriage with Swedes, stood out. Women from the Baltic States intermarry with Swedish-born partners more often than men do, and therefore choose a permanent life in Sweden more often than men do. Both the statistical analysis of the register data and the web-based survey confirmed these gender differences regarding immigration motives. In contrast to other research in which Baltic State immigrants hold low-skilled jobs, this study highlights that many Baltic immigrants in Sweden are also employed as professionals in several fields, like IT, engineering, banking and education. Occupational diversity excludes Latvian concentration in the lower occupational status. And more often than in the UK, Latvians experience occupational transfer. In this respect, there seems to be a difference compared to Latvian immigrants in the UK whereby a considerably larger proportion may be referred to as low-skilled labour, often working in agriculture, cleaning and picking-packing factories and also whereby more immigrants report that they are overqualified. This suggests that Sweden requires a greater investment from the immigrant to succeed in Sweden—for instance learning the language or finding employment, although few migrant support networks are available. It is possible that the motives for migrating to Sweden are more multifaceted than the mere pecuniary.

Agreeing that temporary migration can be beneficial to both the countries of destination and origin (Dustmann & Kirchkamp 2002; Amin & Mattoo 2005; Pinger 2009), we argue that contemporary trends in migration from the Baltic States and especially Latvia under conditions of economic downturn lead to a change in and mix of temporary and permanent migration. There is an emerging pattern of a migration system that combines a fluidity of motives and migration chains promoted by social networks

whereby temporary migration can lead to a permanent stay: partners follow partners, children follow parents and parents re-join their adult children. Based on current research, the Nordic countries emerge as one of the new destinations for Eastern Europeans in search of better paid employment and higher quality of life, instead of the previously popular English-speaking countries, which today in 2011 also suffer from high unemployment. Close geographic proximity with transportation links might develop channels that sustain a more active transnational social space between the Baltics and the Nordic countries.

Sweden and Latvia can serve as examples of how an uneven economic development within the European common labour market can enhance migration systems and, further, that this migration system in just a few decades can evolve into a transnational social space in which people meet and become aware of opportunities and living conditions across countries.

NOTES

[1] The Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovakia and Slovenia.

[2] Internet Protocol address.

[3] Source: www.draugiem.lv; access date 13 December 2010.

REFERENCES

Amin, H. & Mattoo, A. (2005). *Does Temporary Migration Have to Be Permanent?* (World Bank Policy Research Working Papers 3582).

Apsite, E. (2011). "'Do You Know Anyone Who Lives in the UK?' Latvians on the Move in between Latvia and the UK," Manuscript, University of Latvia.

Bailey, A. & Boyle, P. (2004). "Untying and retying family migration in the New Europe," *Journal of Ethnic and Migration Studies*, 30:2, pp. 229–241.

Baker, M. & Benjamin, D. (1997). "The role of the family in immigrants' labor-market activity. An evaluation of alternative explanations," *The American Economic Review*, 87:4, pp. 705–727.

Bengtsson, T. & Johansson, M. (1993). "Economic and social factors behind the slowdown of migration in Nortern Sweden," in *Shifts in Systems at the Top of Europe*, eds. H. Jussila, L. O. Pettersson & U. Wiberg, Stockholm: Fora.

Berninghaus, S. & Seifert-Vogt, H. (1988). "Temporary vs. Permanent. A decision theoretical approach," *Journal of Population Economics*, 1, pp. 195–211.

Bevelander, P. (2000). *Immigrant Employment Integration and Structural Change in Sweden, 1970–1995* (Lund Studies in Economic History 15), Stockholm: Almqvist & Wiksell International.

Borjas, G. F. (1987). "Immigrants, minorities, and labor market competition," *Industrial and Labor Relations Review*, 40:3, pp. 382–392.

Castles, S. (2001). "Migration and community formation under conditions of globalization." Paper presented at conference on *Reinventing Society in the New Economy*, 9–10 March, University of Toronto, Canada.

Chiswick, B. R. (1978). "The effect of Americanization on the earnings of foreign born men," *Journal of Political Economy*, 86:5, pp. 897–921.

— (1999). "Are immigrants favorably self-selected?," *American Economic Review*, 89, pp. 181–185.

Diez Guardia, N. & Pichelmann, K. (2006). *Labour Migration Patterns in Europe. Recent Trends*, *Future Challenges*, Brussels: European Commission.

Dølvik, J. E. & Eldring, L. (2006). "Industrial relations responses to migration and posting of workers after EU enlargement. Nordic trends and differences," *Transfer*, 12:2, pp. 213–30.

Dribe, M. & Lundh, L. (2008). "Intermarriage and immigrant integration in Sweden. An exploratory analysis, *Acta Sociologica*, 51, pp. 329–354.

Drinkwater, S., Eade, J. & Garapich, M. (2009). "Poles apart? EU enlargement and the labour market outcomes of immigrants in the United Kingdom," *International Migration*, 47:1, pp. 161–190.

Dustmann, C. & Kirchkamp, O. (2002). "The optimal migration duration and activity choice after re-migration," *Journal of Development Economics*, 67, pp. 351–372.

Faist, T. (2000). "Transnationalisation in international migration. Implications for the study of citizenship and culture," *Ethnic and Racial Studies*, 23:2, pp. 189–222.

Favell, A. (2008). "The new face of east-west migration in Europe," *Journal of Ethnic and Migration Studies*, 34, pp. 701–716.

Fielding, T. (1992). "Migration and social mobility. South East England as an escalator region," *Regional Studies*, 26:1, pp. 1–15.

Fischer, P. A. & Malmberg, G. (1998). "Performance, mobility and insider advantages. Eastern Europeans and other immigrants in the Swedish labour market," GERUM, Kulturgeografisk arbetsrapport, Umeå: Umeå University.

Gurak, D. & Caces, F. (1992). "Migration networks and the shaping of migration systems," in *International Migration Systems. A Global Approach*, eds. M. M. Kritz, L. L. Lin & H. Zlotnik, Oxford: Clarendon Press, pp. 150–176.

de Haas, H. (2010). "Migration and development. A theoretical perspective," *International Migration Review*, 44, 227–264.

Halfacree, K. (2004). "A utopian imagination in migration's terra incognita? Acknowledging the non-economic worlds of migration decision making," *Population, Space and Place*, 10, pp. 239–253.

Hedberg, C. & Kepsu, K. (2003). "Migration as a cultural expression? The case of the Finland-Swedish minority's migration to Sweden," *Geografiska Annaler* (Series B, Human Geography), 85:2, pp. 67–84.

Jörgensen, H. & Stjernström O. (2008). "Emotional links to forest ownership. Restitution of land and use of a productive resource in Põlva County, Estonia," *Fennia*, 186:2, pp. 91–111.

Kahanec, M., Zaiceva, A. & Zimmermann, K. F. (2009). *Lesson for Migration after EU Enlargement* (IZA Discussion Paper No. 4230, June 2009); http://ftp.iza.org/dp4230.pdf; access date 2 May 2012.

Lalioutou, I. (2010). "I want to see the world. Mobility and subjectivity in the European context," in *Women Migrants from East to West. Gender, Mobility and Belonging in Contemporary Europe*, eds. L. Passerini, D. Lyon, E. Capussotti & I. Lalioutou, New York: Berghahn Books.

Lee, E. S. (1966). "A theory of migration," *Demography*, 3:1, pp. 47–57.

Lundholm, E. (2007). *New Motives for Migration? On Interregional Mobility in the Nordic Context* (GERUM 2007:2), Umeå: Umeå University.

Mahler, S. & Pessar, P. (2006). "Gender matters. Ethnographers bring gender from the periphery toward the core of migration studies," *International Migration Review*, 40, pp. 27–63.

Massey, D. S. & Espinosa, K. E. (1997). "What's driving Mexico-U.S. migration? A theoretical, empirical, and policy analysis," *American Journal of Sociology*, 102, pp. 939–999.

Massey, D. S. & Taylor E. J. (eds.) (2004). *International Migration. Prospects and Policies in a Global Market*, Oxford: Oxford University Press.

Massey, D. S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A. & Taylor J. E. (1993). "Theories of international migration. A review and appraisal," *Population and Development Review*, 19, pp. 431–66.

Meng, X. & Gregory, G. R. (2005). "Intermarriage and the economic assimilation of immigrants," *Journal of Labor Economics*, 23, pp. 135–174

Monden, C. W. S. & Smits, J. (2005). "Ethnic intermarriage in times of social change. The case of Latvia," *Demography*, 42, pp. 323–345.

Niedomysl, T. (2010). "How migration motives change over migration distance. Evidence on variation across socio-economic and demographic groups," *Regional Studies*, 45, pp. 843–855.

— Östh, J. & van Ham, M. (2010). "The globalisation of marriage fields. The Swedish case," *Journal of Ethnic and Migration Studies*, 36, pp. 1119–1138.

Olofsson, J. & Malmberg, G. (2010). "When will the Russians come? On post-Soviet immigration and integration in Sweden," *International Migration*, 49, pp. 93–117.

Pinger, P. (2009). "Come back or stay? Spend here or there? Return and remittances. The case of Moldova," *International Migration*, 48, pp. 181–185.

Piore, M. J. (1979). *Birds of Passage. Migrant Labor and Industrial Societies*, Cambridge: Cambridge University Press.

Portes, A. (1995). *The Economic Sociology of Immigration. Essays on Networks, Ethnicity, and Entrepreneurship*, New York: Russell Sage Foundation

Rauhut, D. (2004). *Replacement Migration to Sweden. An Overview of Possible Sender Countries* (Report A2004:016), Östersund: Swedish Institute for Growth Policy Studies; www.tillvaxtanalys.se/tua/export/sv/filer/publikationer-arkiv/itps/rapporter/2004/replacement-migration-to-sweden-04.pdf; access date 2 May 2012.

Salt, J. (1987). "Contemporary trends in international migration study," *International Migration*, 25, pp. 241–251.

Schoorl, J. (1998). *The Analysis of Factors Generating International Migration. A Multi-Country Approach to Study the Determinants of Migration*, Technical Symposium on International Migration and Development, The Hague, Netherlands 29 June–3 July 1998, paper No. 4/1.

Stark, O. (1991). *The Migration of Labour*, Cambridge: Basil Blackwell.

Statistics Sweden; www.scb.se/default____2154.aspx; access date 2 May 2012.

Tamas, K. & Münz, R. (2006). *Labour Migrants Unbound? EU Enlargement, Transitional Measures and Labour Market Effects*, Stockholm: Institute for Futures Studies.

Wadensjö, E. (2007). *Migration to Sweden from the New EU Member States* (IZA Discussion Paper No. 3190, November 2007); http://ftp.iza.org/dp3190.pdf; access date 2 May 2012.

JOURNAL OF NORTHERN STUDIES Vol. 6 • No. 1 • 2012, pp. 53–109

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Roald Amundsen and his Ambiguous Relationship to Science

A Look at Outcomes of his Six Expeditions

ABSTRACT Roald Amundsen's active life as an explorer coincided with a period of important changes in the earth sciences. The purpose of the present paper is to situate some of his endeavours in relation to those trends. On the one hand there was a continuation of empirical traditions in field sciences driven by the same inductivist approach that motivated the First International Polar Year 1882–1883. On the other hand there were major advances in instrumentation, plus a strong professionalization of research. The latter involved new mathematical methods used by hypothesis-minded geophysicists who probed the dynamics of physical processes. In this context Amundsen was what Fridtjof Nansen called a "scientific explorer." The paper traces some of the tensions engendered in this role midway between two scientific trends while at the same time the explorer's public image followed the tradition of popular geography steeped in nationalism and prestige that drove the steeplechase of being first to set one's foot on and attach names to hitherto undiscovered places. It is shown how several of Amundsen's expeditions resonated strongly with contemporary trends and interests in scientific societies, especially in Norway. At the same time he was pulled between loyalty to Fridtjof Nansen and science and an unending quest for recognition and media visibility as a dashing explorer. Since much has been written about Amundsen's sportive and adventurous side, not least in connection with the dramatic race to the South Pole, the focus in the present paper is chiefly on his relationship to science, an aspect often glossed over. First

Amundsen's position as a reflective practitioner is characterized and highlighted. Secondly, the Norwegian and international scientific contexts of his expeditions are sketched, and, third, an assessment is made of the scientific outcomes of the projects he initiated and their uneven reception over time in a number of disciplines, since he left it to others to translate data into science while he himself restlessly moved on to the next challenge. It is found that although never a scientist himself, Amundsen's initiatives generated considerable amounts of empirical data that was of value once it was reduced, analysed and interpreted by professional scientists. Perhaps even more importantly, his expeditions or projects helped further the scientific careers of a number of brilliantly resourceful persons.

KEYWORDS R. Amundsen, F. Nansen, H. U. Sverdrup, polar science, explorers, Northwest Passage, polar history, race to the pole

Expeditions Roald Amundsen was involved in
(for overview and highlights, see Barr & Ekeberg 2005)

Date	*Expedition on*	*Amundsen's role*	*Location*
1897–1899	*Belgica*	2nd mate	Antarctic Peninsula
1901	*Gjøa*	leader	Norwegian Sea
1903–1906	*Gjøa*	leader	North West Passage
1910–1912	*Fram*	leader	Antarctica/South Pole
1918–1920	*Maud*	leader	North East Passage
1922–1925	*Maud*	absent leader	Bering Str & Siberian coast
1925	N24 & 25 hydroplanes	leader	Spitsbergen to near N Pole
1926	*Norge* airship	leader	Spitsbergen–N Pole–Alaska

1. Introduction

On Friday 14 December 1911 Roald Amundsen (1872–1928) reached the South Pole. With him he had his faithful expedition companion Oscar Wisting (1871–1936) and three other men. When less than twelve years later Amundsen flew over the North Pole in a dirigible, Wisting was there too—they were the first two persons to reach both poles. When he died in 1928 Amundsen went to history as a legendary explorer, one of the last belonging to the heroic age.

Amundsen's arrival at the South Pole and Robert Falcon Scott's (1868–1912) the following month, 18 January 1912, are naturally the subject of much attention these days of centennial recollection and remembrance. Much has been written about the differences in the two men's personalities, their rivalry, different approaches to polar travel and their respective relationships to science. Regarding science Scott's role as a facilitator of research is gener-

ally seen as positive, while Amundsen's relationship to science is more tenuous (for recent appreciations of Scott's role see MacPhee 2010; Larsen 2011; on Amundsen see Huntford 1987; Hestmark 2004; Barr & Ekeberg 2005; Lüdecke 2011).

In the present paper the focus is on Amundsen the individual (for recent biographies see Jensen 2011; Wisting 2011; as well as one on Amundsen's faithful companion and skipper Oscar Wisting, by Hansen 2011). The approach is conventional with no attempt to sociologize or place the man in a broad context that might include early twentieth century movements of amateur observers to be found in astronomy and botany. Much more might also be said to situate him in the history of polar technology for terrestrial or aerial transport, but this will not be done here. The purpose is simply to look more closely at some of the science that came out of Amundsen's expeditions even if he himself was not the one who actually did the research. The question is if he nevertheless to some degree might be regarded as a facilitator for doing science, a role he apparently claimed for himself. The first part of the paper (sections 2–5) covers what is already familiar for some readers, but the story line is given a novel twist by introducing the category "reflective practitioner" to characterize the explorer; the second part (sections 6–9) situates him in relation to contemporary scientific developments and in addition does something new—it *systematically* reviews the outcome of his expeditions and the uneven reception of the results.

When the Swedish geologist J. Gunnar Andersson (1945), a veteran of Antarctic research and exploration, writes about Roald Amundsen in the book *Männen kring Sydpolen* ['The Men around the South Pole'], he finds himself puzzled by the distinction the great explorer made between "research" and "science"—in Swedish a distinction between *forskning* and *vetenskap*. Andersson refers to a passage in Amundsen's controversial autobiography of 1927, *Mitt liv som polarforsker* ['My Life as a Polar Researcher'], translated into English the same year as *My Life as an Explorer* (compare the difference between the key terms in the Norwegian and English titles). The passage at issue is one where Amundsen writes about the geomagnetic studies undertaken at Gjoa Haven 1905–1906. Andersson makes the comment:

> After a visit with Nansen, who offered him his support, he [Amundsen] decided to study geomagnetic science and familiarize himself with methods of geomagnetic observations. In this connection he states in his autobiography something that, however mysterious in my eyes, maybe provides a key to interpreting the strange use he makes of the word *forskare* ['researcher'], an epithet he often particularly likes to use to describe himself. He writes about the geomagnetic studies: 'My

> [*Gjøa*] expedition would also have a scientific goal apart from research [Swedish *forskning*] itself.' In the Swedish language *forskning* ['research'] and *vetenskap* ['science'] are certainly identical. Is it different in Norwegian, or is it something that is unclear in his way of expressing himself? (Andersson 1945: 142–143.)

In the same vein Andersson notes that Amundsen visited the geophysicist Georg von Neumayer in Hamburg and there received a crash course in the act of handling geomagnetic instruments. "Thanks to this exemplary training Amundsen became a very skilled earth magnetic observer," Andersson concludes, still puzzled however by the purported difference between *vetenskap* ['science'] and *forskning* ['research']. Fridtjof Nansen had also sent Amundsen to Bjørn Helland-Hansen (1877–1957), who was a Norwegian pioneer in the field of modern oceanography and in 1915 became professor in this field at the University of Bergen, and two years later director of the university's renowned Geophysical Institute. It was Helland-Hansen who gave Amundsen some training in methods of oceanographic measurement and observation and later was instrumental in recruiting both Harald U. Sverdrup (1888–1957) and Finn Malmgren (1895–1928) to Amundsen's *Maud* expedition, which thanks to the efforts of these men led to significant scientific contributions despite the fact that the expedition's intended objective—to repeat Fridtjof Nansen's ice-locked polar drift experiment across the Arctic Ocean—was never achieved.

Sverdrup was the scientific mainstay of the *Maud* expedition (Dahl & Lunde 1976; Barr & Ekeberg 2005: 192, 196; Friedman 2004: 145–157). He saw to it that its various results got published as quickly as possible. His was the approach of a professional scientist, contrasting sharply with Amundsen's as an amateur and data-collector. The difference in the two men's respective interests and competence immediately becomes clear when we compare the scientific legacy of the *Maud* with that of the *Gjøa* expedition. In the latter case data collected in 1903–1904 were entirely left to others to work on and mostly did not see publication until 1932; because of the big time lag the impact was rather incidental even if researchers nowadays—retrospectively—find some relevance in the *Gjøa*-data series when tackling current research problems.

2. Navigating between Scientism and Ideologically Tinted Perspectives

What Andersson did not realize in his retrospective reflections on men around the South Pole was that Amundsen never purported himself to be

a scientist; rather he was concerned with his own role as polar explorer, one that included both geographic discovery and setting records. No wonder then that J. Gunnar Andersson in his book homed in on Amundsen's shortcoming, remarking that the latter and his four men raced back and forth to the South Pole "over the unique ice barrier and especially when crossing the mountain range Amundsen named after his country's queen." Had they taken a moment to pause for the sake of science they would not have missed, as they did:

> the richest opportunities for observations concerning topography, geomorphology and geology [...] a couple of days in the mountains would have given the richest results had they only had amongst them one single modern schooled geographer. (Andersson 1945: 154.)

But then again, he adds, perhaps

> it is only petty and stingy scientific disciplinarity that speaks [...] if I add the regret that none of these polar heroes represented any sort of scientific competence outside simple observational service with respect to meteorological and earth-magnetic phenomena. (Andersson 1945: 153.)

On his way back from the South Pole he did collect a small sample (20 items) of various kinds of rock on the polar route, and Kristian Prestrud's side-expedition collected a second sample (30 items) at *Scott's Nunatak* in the Alexandra Mountains, which was the only mountain they came across that was bare of snow.[1] Two reports on these findings were written by the Norwegian mineralogist J. Schetelig (1912; 1915). But of course, it did not amount to much.

To be fair to the Swedish geologist he did recognize the expedition's significant geographic contribution to filling in some important features on a previously empty map of the interior of Antarctica. Positive too was the surveying and cartographic effort of the "Eastern-group" consisting of Johansen, Prestrud and Stubbered when it came to clarifying the contours and features of King Edward VII Land (which Richard Byrd later proved to be a peninsula) (Andersson 1945: 159; Stewart 1990: 294). In addition Andersson gave the men on the *Fram* credit for their extensive oceanographic investigations before the ship's return to the Ross Ice Barrier (now called *Ice Shelf*) to fetch the winter party for the journey back to civilization, reaching Hobart, Tasmania, in March 1912 to tell the world about a South Pole mission successfully completed. Andersson of course also expressed great respect and admiration for Amundsen's planning and logistic abilities as well as his cunning reason and technical knowledge that included elements

derived from earlier exposure with Inuit cultures, knowledge that proved useful for effective transport and survival in polar regions.

In many accounts of Amundsen's achievements the tendency has been to focus on his personality, record setting, the shift of plans after Fredrick Cook and Robert Peary's announcements in 1909 of the capture of the North Pole, and the subsequent competition with Robert Scott to reach the other pole.[2]

Peary was one of the best known of American Arctic explorers. He set a tone not uncommon in geographical societies just after the turn of the century when he expressed a then partly prevailing attitude in his presidential address at the opening of the Eighth International Geographical Congress, held in the United States during the summer of 1904:

> There is no higher, purer field of international rivalry than the struggle for the North Pole. Uninfluenced by prospects of gain, by dreams of colonization, by land lust, or politics, the centuries long struggle of the best and bravest sons of England, Germany, Norway, Sweden, Holland, France, Russia, Italy, and the United States, whose able delegates are here today, has made this field of effort classic, almost sacred (cited in Hiscott 1992: 22).

This view has intermittently continued to spice narratives of the race to the South Pole. Fascination with personalities and the drama of conflict has made it all too easy to dismiss Amundsen's significance for science, since he was not a scientist but an explorer. His adventurous and sportive side still makes for a good story line to stir the reader (cf. Huntford 1979). Time and again similar perspectives also get played up in accounts of the exploits of Ernest Shackleton, another strong personality whose life similarly continues to capture the popular imagination in a time like ours, when strong leadership and entrepreneurship are promoted as virtues in our neoliberal world under the banner of privatized globalisation (see for example Morrell & Capparell 2001).

My purpose in the present paper is to step away from such portrayals in order to nuance and problematise the picture of Amundsen's relationship to science.

3. Taking a Leaf from H. U. Sverdrup

In a lengthy biographic review of Amundsen's life and work prepared for the fifteenth volume of Vilhjalmur Stefansson's twenty-volume *Encyclopedia Arctica*, H. U. Sverdrup has given what in my estimation is a fair and forthright appraisal of the explorer's intentions and approach. Although

somewhat idealized the review also provides an answer to J. Gunnar Andersson's ruminations. Therefore I quote it at length. It is a snapshot informed by Sverdrup's personal experience, not least during the course of the lengthy and oftentimes frustrating time in connection with the *Maud* expedition.

> Amundsen said of himself that he never became an arctic explorer, because since he was fifteen years old all his thoughts and his energy had been directed toward one goal—the expansion of our knowledge of the Polar Regions. Circumstances made it necessary for him to change plans and make detours, but after he had sailed through the Northwest Passage, his one all-absorbing idea from 1908 to 1926 was to cross the Arctic Ocean and reach the North Pole. The attainment of the South Pole was incidental. Amundsen was not a scientist and he never claimed to be one. He was interested in securing exact information wherever he travelled and in giving specialists opportunities to carry out observations on his expeditions, but he cared little for their conclusions and even less for their theories. When he talked about men of science he had met, he would stress their personal characteristics and not their scientific achievements.
>
> Thoroughness in planning, meticulous attention to details, and nearly fussy orderliness combined with bold initiative laid the foundations of Amundsen's success. To this should be added his ability to select suitable companions and to gain their unqualified confidence in his leadership. In selecting his men he apparently looked for one particular characteristic: resourcefulness. When preparations were still in progress, he might ask a question about a difficult task or give a man an impossible assignment. If he got the answer "it can't be done," he was through with the man then and there, but if the man later returned to the matter and explained how he had tried to tackle the problem, Amundsen was satisfied even if the result was entirely negative.
>
> On his expeditions Amundsen demanded of his men punctuality and orderliness corresponding to his own. During the *Maud* Expedition he himself worked as cook for two years with members of the party alternating as mess boys. Never was the galley more shining and orderly, with every pot as well as other utensils in its proper place. He established a strict daily routine broken only by festive occasions during which he more than anyone else knew how to create a congenial atmosphere. His men loved him.

And then Sverdrup somewhat laconically adds, "Amundsen's financial troubles stood in sharp contrast to his meticulous orderliness in other matters;" it was a trait ascribable to an attitude that "regarded money as a necessary evil of no value of its own," a means to attain higher goals (Sverdrup 1959: 234–235; compare Sverdrup 1928).

The foregoing reflection was written more than forty years after Sver-

drup signed up for the *Maud* expedition. To balance it out one should remember that Amundsen was also opinionated, easily slighted and unable to tolerate anyone questioning his judgement as a leader even if he was in error. These traits are evident when one considers his behaviour on a number of occasions.

One time was when as a senior ranking officer on the *Belgica* he was outraged by being passed over when the expedition leader Adrien de Gerlache selected someone else to take over command of the ship in the event that Georges Lecointe was incapacitated, the reason being that Amundsen was not a Belgian citizen. The decision was dictated by the Belgian Geographical Society before the ship left Antwerp (Decleir (ed.) 1998: 166–171). In Amundsen's diary the ship's doctor Fredrick A. Cook is approvingly cited as saying "that the Geographical Society had drawn a line between the honest Belgians and the dishonest foreigners."

A second telling incident is the well-known story when Hjalmer Johansen, an expert dog driver and polar veteran with experience from Fridtjof Nansen's famous Arctic expedition, spoke his mind regarding Amundsen's impatience (to be sure to beat Robert Scott) that led to the mistaken decision to make a premature start for the South Pole under extreme conditions that almost cost Kristian Prestrud his life had it not been for Johansen. Enraged, Amundsen took both Johansen and Prestrud off the south-pole team, consciously degrading and humiliating Johansen for having bluntly spoken the truth and in so doing threatened the expedition leader's authority (cf. Bomann-Larsen 1995: 164, 491–492; Barr & Ekeberg 2005: 155).

After the flight across the North Pole with the airship *Norge* Amundsen was frustrated and angry that the "mere skipper" Umberto Nobile was much more in the limelight than he himself. This led to acrimonious attacks on Nobile by Amundsen in his autobiography; for the background and Amundsen's schisms with several other persons including his own brother Leon, see Bomann-Larsen 1995: 477 ff.

And then of course there is Sverdrup's view that "the attainment of the South Pole was incidental." Considering how pride, personal ambition and what we today call "image" were also important driving factors in Amundsen's life one can just as well say that sometimes the reverse was the case—science, and not the Pole, became incidental.

4. A Reflective Practitioner in a Field of Tension between Exploration and Science

4.1 The Concepts of Reflective Practitioner and Facilitator

The notion of "reflective practitioner" comes from Donald Schon (1983), who has analysed the role of tacit knowledge and skills as well as continual learning in various practices. The concept emphasizes the personal dimension in the acquisition of skills and technical knowledge. It has been used to refer to the knowledge of engineers, inventors, surveyors, foresters, cattle breeders and others involved in practical pursuits with for the most part only an incidental bearing on science.[3] The concept is also used in relationship to science in order to foreground the context of discovery and with it all the informed guesses, hunches and imaginings that are part of exploratory acts motivated by what Michael Polanyi (1958; 1967) describes as "passions." Thence the question of the boundary between exploration and research does not assume hard and fast lines of demarcation but calls for attention to the overall purpose of a practice, be it research or exploration.

Amundsen never claimed to be a scientist but he thought that what he did also served a broader context wherein the advance of scientific knowledge was important and that meticulous observations and generation of earth-magnetic, meteorological and oceanographic data was a contribution to that end, to science. The term *polarforskere* did not, as Andersson possibly thought, refer to science as such but had a broader connotation associated with 'inquiry,' 'investigation' or (in Swedish) 'utforskning,' where the latter term in connection with Polar Regions translates into exploration of the same. Thus there were professional explorers, enrolled by Fridtjof Nansen to carry out physical observations and measurements, data that would feed into the Nansen's program and vision at the University of Kristiania/Oslo for advancing Norwegian geoscience and therethrough also the prowess of Norway as a newly independent nation and a polar nation to be reckoned with.

The key issue here was the need Nansen saw to develop and consolidate his own work in the Arctic at a time when a new centre for geophysical research was emerging in Bergen that historically has come to be associated with the mathematisation and professionalisation of the field. Several studies by Norwegian historians of science based on archival material have enriched our picture of polar research and the development of modern geoscience (Friedman 1989; Friedman 1994; Friedman 1995; Drivenes, Jølle & Zachriassen (eds.) 2004; Drivenes & Jølle (eds.) 2006). Harald Dag Jølle's

recent Nansen biography has shed new light on the role Amundsen was meant to play as a potential disciple at a critical juncture with a new North Pole expedition in the Nansen tradition that was meant to start in 1910 (Jølle 2011; also Jølle 2009). Friedman has recently in a play dramatised Nansen's fury and frustration in a fictional showdown with Amundsen for turning his back on polar science for the sake of polar sport.

> Nansen publicly defended Amundsen [...] Privately he was furious. Adding to Nansen's frustration, political intrigue kept Helland-Hansen in Bergen and lack of physical infrastructure and support prompted Bjerknes to accept a call to Leipzig. Nansen's vision for an internationally-leading centre for geophysical science in Oslo was crushed. (Friedman 2011: 6; see further below, footnote 7.)

The phrase "facilitator of science" requires some explanation. There is both a narrow and a broader sense of the term *facilitator*. In the narrow sense the criterion of facilitating is a strong one. It requires an explorer to be directly involved and seeking to actively promote research, not only by participating in measuring physical parameters and enforcing a plan of data collection, but also in following up in the next phase, data reduction, analysis, interpretation and publication in scientific journals or monographs. Examples that come to mind are William Bruce Spiers and Otto Nordenskjöld, whose expeditions also belonged to the heroic age of Antarctic exploration.

The broader sense of facilitating research is weaker. In that case it is sufficient if the explorer is engaged in data collection or failing this his contribution lies in initiating and equipping an expedition for scientific purposes and recruiting persons with adequate scientific training, thereby facilitating the scientific career of others and therewith more indirectly also science.

Amundsen role as a facilitator of science—in as far as he was one—obviously falls into the second category. In the absence of any real enthusiasm for science his engagement in Nansen's program for physical oceanography with a new Arctic drift experiment ultimately ended up as a mere fulfilment of a moral obligation to his mentor. Early in his career as explorer Amundsen carried out some measurements of physical parameters and enforced plans for data collection. However, he did not directly involve himself in data reduction, analysis and interpretation. Neither did he exert much energy in efforts to find funding to support such time-consuming endeavours. This was left to the home institutions and devices of the researchers that worked with the data and published eventual findings. He had his own agenda.

Amundsen's own concern when it came to funding was mostly devoted to initiating and financing new and daring expeditions. In Friedman's rendering of a heated exchange with Nansen, Amundsen says "private donors

don't give a damn about volumes of data, they want records won," and he asserts that "some records can never be broken—a fame that cannot be washed out with time—the conquest of the poles" (Friedman 2011: 6). Nansen campaigned to create a professorship for Amundsen, in part to provide him with a stable income but also to "keep him in the camp of serious polar research," but Amundsen refused, declaring that he was not a scientist.

Amundsen's quest for immortal fame however took time and energy, travelling and lecturing to raise money, lobbying, over and over again, and constantly trying to sustain a media image of his person as one of the great explorers. These activities also at times got him embroiled in conflicts with institutions and nerve-racking personal antagonisms with a variety of supporters and rivals. As Jan Ove Ekeberg has put it, in his later years his greatest goal was no longer to discover the world but to see to it that the world discovered Roald Amundsen; "the bigger he became the more he was concerned with that" (in Barr & Ekeberg 2005: 12). This is probably one of the reasons why after the completion of the expedition through the Northwest Passage it took over twentyfive years before its scientific results were published, and then only thanks to funding from a memorial fund set up after Amundsen's death in order to honour him as a Norwegian national hero—thus ultimately a kind of symbolic action. Even if he was posthumously listed in part as editor and co-author, in reality he had not contributed to the analysis. His competence did not suffice for that (Hestmark 2004: 101–103).

In the twentyfive years that had passed the gap between the professional scientist and the amateur had also widened with the advent of an entirely new mathematically inclined generation of geophysicists. They were at the same time less glamorous individuals. With Amundsen's South Pole expedition the time of global geographic discoveries had essentially ended. Since the purpose of the present paper is to situate Amundsen in relationship to scientific networks, part of the story that follows must also note the changing style of geoscientific work and networks.

4.2 Geography's Janus Face

When Amundsen pursued his polar passion and formulated his own goals and plans it was also in the wake of the late nineteenth century debate on what was the proper task of geography. Was it exploration and the discovery and naming of new land? Or was it scientific inquiry into the geographic, geomagnetic, meteorological, hydrographical features of the Earth, auroral phenomena, or geological, geomorphologic and other aspects of lands and seas in the polar and other regions?

In geographical societies in different countries an essential tension between the double faces of geographic exploration sometimes manifested it-

self in a polarisation between popular geography and academic or scientific geography. The same tension was evident in the controversy surrounding Sir Clements Markham's emphasis on exploration for imperialist reasons to the detriment of scientific research in the mandate he wanted to give Robert Scott's *Discovery* Expedition 1901–1904. In a different form it could be found at universities in conflicts and debates around 1900 regarding the definition of academic chairs in geography. Furthermore, one finds it in the division amongst those involved in the establishment of the International Polar Commission (IPC), a forgotten body that emerged in 1908 from several meetings and debates concerning priorities and agendas for polar research and exploration.

Otto Nordenskjöld, William Spiers Bruce, Henryk Arctowski, Georges Lecointe and Jean-Baptise Charcot belonged to a little group that insisted on the primacy of scientific work and the need for international collaboration, thus opposing the views of others who were more closely tied to rather traditional approaches in which nationalism and geographic discovery might dominate (International Polar Commission 1908; Lüdecke 2001; Elzinga 2004). When the IPC finally—after much delay—was formally established at the International Geographical Congress in Rome 1913, the effort to institutionalize polar research in an international cooperative mode had lost momentum. The First World War did the rest to drive the new organization into oblivion. After the war other actors and other institutional arrangements came to the fore without linking back to its agenda—nevertheless several personalities who had participated in the IPC surfaced again later in the preparatory phase of the Second International Polar Year (IPY-2) 1932/33, among other places in the Aeroarctic, an organization to promote Arctic aviation chaired by Fridtjof Nansen (Aeroarctic 1924; Lüdecke 2008).

Rival stakeholder interests and cultures of inquiry that existed in the geographical societies of many countries considerably influenced epistemic boundary management within geography in the late nineteenth and early twentieth centuries. Thus an appreciation of the way boundaries were drawn between geographical exploration and academic or scientific geography has to take into account the historical and political contexts in which conflicting views were played out (cf. Hiscott 1992).

4.3 Convergence of Old and New Scientific Epistemologies

The other question at issue has to do with the ideal of science that dominated in field sciences during the latter part of the nineteenth century. In this respect it is important to realize that the dominant ideal of science was inductivist and not the hypothesis-driven view of science that with Nansen and even more with Bjerknes gained a stronger position in the early twen-

tieth century. This is evident if one considers the epistemology reflected in the efforts of the First International Polar Year 1882–1883, an epistemology that continued to influence the conception of science in polar endeavours in important respects during the first couple of decades of the twentieth century (Elzinga 2009).

In circles concerned with geophysical investigations in the Arctic a plan emerged to incorporate Amundsen's proposed repeat of Nansen's north polar drift experiment into a broader exercise that if it had been carried out would have been a precursor (mini-)second polar year. Some of the inspiration appears to have come from Nansen himself, who in a paper entitled "On North Polar Problems" read before the Royal Geographical Society in London in 1907 identified a number of questions: the possibility or not of land near the North Pole hypothesized by R.A. Harris at the Eight International Geographic Congress, Washington, 1904; the character of the continental shelf of the North Polar Basin and its extensions north of Siberia and Alaska respectively; the directions of north polar currents and the drift of the ice; the nature of the ice in the different parts of the north polar sea, and some other issues (Nansen 1907). Nansen was coming to the end of his term in London as emissary representing the New Norwegian state, formed when the union with Sweden was dissolved. Members of the Society were impressed by his scientific acumen. His famous bathymetric map of the Arctic Sea basin was included in the paper. Significantly, Amundsen's announcement to organize a new Arctic polar drift experiment came in the year after Nansen's famous speech before the Royal Geographical Society in London and fit into Nansen's scientific ambitions in Oslo.

Meteorologists were interested in developing synoptic observations of weather patterns across the Arctic and geomagneticians were concerned with fluxes in earth magnetism and atmospheric electricity, questions that had been at the heart of the First IPY. Observations of aurora also continued to preoccupy geophysicists in Nordic countries, particularly Norway and Finland. At the same time a new generation of mathematically-minded researchers were coming forward, interested in the dynamics of atmospheric and ocean systems. Thus in several parts of the scientific community there was an interest in Roald Amundsen's attempt to repeat Nansen's polar drift experiment on a vessel that could serve as a research platform (Amundsen 1908).

5. Learning by Doing

Throughout his life Roald Amundsen seems to have been more fascinated by the techniques, new instruments and logistic problems of polar exploration

than the actual science that was produced. That does not mean he shunned science, on the contrary in his younger years he became quite well versed in some areas of geosciences, particularly magnetism. Yet, the main challenge for him did not seem to lie there; it lay in the setting of well-defined practical goals and devising efficient means to achieve them. Sometimes it meant taking a calculated risk. In public lecture halls and through books he also learned to popularize and spellbind audiences with his narratives about polar exploits, even if he did not like the fickleness of public opinion upon which he was often dependent when it came to raising funds for new projects. The complete texts of Amundsen's lectures about his expeditions through the Northwest Passage and to the South Pole illustrated with the original hand-coloured lantern slides he used may be consulted in the Fram Museum Exhibition book *Cold Recall. Reflections of a Polar Explorer* (Kløver (ed.) 2009).

5. 1 Early Experience

On the Belgian Antarctic Expedition 1897–1899 Amundsen was second mate on the *Belgica*. Here he got his first taste of overwintering and being locked in the sea ice during the long polar night. His diary (Decleir (ed.) 1998) bears ample witness to his resourcefulness. He gained a wide range of practical knowledge of ice navigation, while Cook showed him survival techniques on the basis of penguin and seal diet, tested polar clothing, tents and sledges. Amundsen also learned for example that "man hauling," sledges pulled by men, was a very exhaustive and inefficient mode of travel. Tutored by the ship's captain Georges Lecointe he also learned astronomical position fixing in the field and took part in some magnetic measurements (Decleir (ed.) 1998: 151).

In addition there were the physical and medical problems of men in isolation. Much attention in the diary is devoted to logistic techniques and attempts to free the ship from the pack ice as the austral spring came along. The young Amundsen paid some attention to the behaviour of marine animals, but otherwise he displayed little interest in scientific topics. The drift of the *Belgica* in the ice confirmed, however, the importance of the kind of oceanographic studies Nansen had made just a few years before during the *Fram* expedition in the Arctic 1893–1896. Amundsen, Lecointe and the expedition doctor, Frederick A. Cook, were the ones who adapted best to the strain and difficulties and the three of them developed the ambition to reach the Magnetic South Pole once the *Belgica* was freed from the ice, but that plan never materialized.

The techniques of exact measurement and observation performed by Lecointe were a starting point for Amundsen's sorties to study the Earth's

magnetic field near the North Pole. Once back home again he was introduced to George von Neumayer at the Deutsche Seewarte in Hamburg where he gained a deeper working knowledge of the theory and practice of magnetic observation. Following his studies at Hamburg he also developed invaluable contacts with the Wilhelmshafen maritime observatory and the Potsdam magnetic observatory. During a number of visits to these observatories in the years 1900 to 1903 he acquired, together with his assistant Gustav Juel Wiik, several magnetic instruments and received more detailed training in their use when preparing for the *Gjøa* Expedition (1903–1906).

The pursuit of magnetic studies became the rationale for seeking to navigate the Northwest Passage on an expedition that would include finding the exact location of the North Magnetic Pole. For this purpose in 1900, Amundsen purchased and outfitted a small ship, the *Gjøa*, for a northern expedition. Before that, however, he spent one summer to make oceanographic observations in the Arctic, among others, carrying out a vertical series of temperature and salinity measurements taken in the sea between Jan Mayen, Greenland and Spitsbergen for Fridtjof Nansen, who worked up the results and published them in book form (Nansen 1906). A frontal page has Nansen's dedication: "to Roald Amundsen the careful planner and happy leader of Arctic enterprise."

The *Gjøa* expedition into the Arctic Ocean and the Northwest Passage followed in the summer of 1903. Preparations included perusal of accounts of the tragic events of the Franklin expedition and later expeditions sent in search of survivors or remnants. The newly returned Second Norwegian Polar Expedition with the *Fram* led by Otto Sverdrup 1898–1902 had among other things explored and claimed three newly discovered islands in the archipelago north of Barrow Sound (a western continuation of Lancaster Sound).[4] Geographic details were presented on a famous map drawn by Gunnar Isachsen and appended to the second volume of Sverdrup's popular account, *Nytt Land* ([1903] 1904). On the basis of his historical and cartographic studies Amundsen developed a hunch where he might find the most suitable route to prevent meandering in archipelagic "blind alleys." From 1903 to 1905, the men wintered on King William Island in the small protected harbour of Uqsuqtuug; at a place they called *Gjøahavn*,[5] where study of the magnetic field soon proceeded. Observations offered the first empirical demonstration that the North Magnetic Pole had no exact location but constantly varied its position over a wide area. With the data the elliptical course that it followed could be calculated. During this time, Amundsen met the Inuit of Northern Canada and learned the technique of using snowshoes, and learning by doing he extended his earlier rudimentary experience with dogs and dog sledges.

When observations regarding climatic conditions and earth magnetism near the North Magnetic Pole were completed, Amundsen continued his navigation of the Northwest Passage. Pushing on through dangerous waters and ice, he eventually accomplished his goal: the first to successfully navigate the entire Northwest Passage in a single vessel.

5.2 Pulled between Science and "Storming the Pole"

A few years later he resolved to spend seven years in the Arctic on a transpolar drift to carry out oceanographic investigations with new instruments that had come on line since Nansen's transpolar drift.[6] Such an experiment would advance knowledge of the dynamics of currents and tides as well as of the bottom profile of the Arctic sea basin. The new initiative was presented as a strictly scientific endeavour and scientists at the time were very interested and supportive. When outlining the project before the Royal Geographical Society in London at its meeting on 25 January, 1909—where he was introduced as a "scientific explorer"—Amundsen emphasized:

> It is the exploration of this basin, the nucleus of the polar regions, to which we must turn all our attention. Many people think that a polar expedition is only an unnecessary waste of money and life. The idea of a polar expedition is connected with that of a record, of reaching the pole or farther north than any of its predecessors; and if this is the case I agree with them. But I must most emphatically assert that the storming of the pole will not be the object of this expedition. Its aim will be a scientific study of the polar sea itself, or rather an investigation of the bottom and oceanographic conditions of this great basin. (Amundsen 1909:454.)

There was no indication of a hidden agenda to "capture" the North Pole. Scientific credibility of the proposed expedition was underlined by a message from Fridtjof Nansen to the RGS that was read out at the meeting; in it he strongly endorsed and vouched for Amundsen's project. In Nansen's eyes Amundsen was still his potential scientific disciple enrolled in a grand program of Norwegian geoscience based in Oslo.

For his seven-year Arctic drift project Amundsen borrowed Nansen's famous state-owned ship, the *Fram*, allegedly to sail round the Cape of Good Hope in order to reach the Bering Strait as planned. But after Cook "took the North Pole" the plan was secretly changed; now instead came the important prize winning detour to the South Pole that re-secured Amundsen his public image and prestige as a leading explorer.

Since science was the official excuse and justification for using the *Fram*, and the vessel was equipped with many instruments, not least ocean-

ographic ones for use en route southward in the Atlantic, it seemed natural that Amundsen came on board the vessel in Oslo rather than in San Francisco (as originally intended just to meet up when the time came to head into the Bering Sea). The scientific instruments now served as part of a useful smokescreen to guard the secret of the new goal; too immediate a release of information regarding the radical change of plans, it was feared, would seriously erode support from the scientific community and other sponsors.

The "incidental" goal was reached on 14 December, 1911. This was 33 days before Scott's team. In the case of Amundsen's team it had taken roughly eight weeks of travel across hidden crevasses and rifts. Another five and a half weeks and the group were back at base camp. Practical knowledge gained earlier of managing men, logistics and the use of sledge dogs to haul supplies now came to good stead. In his equation he even calculated the flesh of the dogs that carried the provisions as part of the food for animal and human consumption on the return trip from the pole to the base station *Framheim*. The selection of the starting point on the Bay of Whales at the edge of the Ross Barrier hinged on thorough acquaintance with and comparison of observations reported by earlier explorers who had been in the region. A close study indicated that there had been little or no change in the barrier's contour at this spot. Thus Amundsen deduced that here was a stable site for a base that was one degree of latitude closer to the pole than the starting points British explorers were wont to use. As it turned out the place was also less stormy than Robert Scott's base station *Terra Nova Hut* at Cape Evans on Ross Island at the entry to McMurdo Sound.

After his return from Antarctica Amundsen was morally obliged to take up the original Nansean plan, to pursue oceanographic studies in the Arctic for a period of seven or eight years. When it turned out that woodrot had got into the *Fram*'s hull and therefore an extensive costly overhaul was needed, it was decided to build a new ship. He also took flying lessons (getting his license in 1912) and acquainted himself with aviation and aviators. These new skills and knowledge later turned out to be useful when the next expedition, the *Maud* expedition (1918–1925), once it finally did get going, also failed to fulfil the original intention of drifting by the North Pole. Since it repeatedly ended up in the icepack in the wrong place, he developed an alternative strategy for his private goal (reaching the pole), and in the course of this helped facilitate pioneering efforts in polar aviation.

6. Significant Context. The Old Inductivist Ideal in Science and the New Generation of Hypothesis-Minded Geoscientists

The general idea behind the First International Polar Year was to obtain an overview of geophysical phenomena in poorly known parts of the world in the hope of gaining for the first time detailed meteorological and earth magnetic pictures of the world. Epistemologically the plan rested on an inductivist ideal of science, giving primacy to systematic observation and hoping that some patterns transcending the local might emerge from the data. This would give clues to relationships and trends that might be found by generalising from discrete time series of observations obtained at many sites. The chief architect and initial source of inspiration behind IPY-1, Karl Weyprecht, expressed the ideal in 1878 as

> proceeding through comparison to deduce from observations collected at different points, independent of the particularities that characterize the different years of observation, the general laws governing the phenomena under study (cited in Summerhayes 2008: 323.)

The same kind of approach, albeit linked to one or another hypothesis as in Nansen's case concerning currents in the Arctic Ocean, was important in oceanography as witnessed by the scientific results coming out of the drift of the *Fram*. In another field, Kristian Birkeland in 1908 noted that during his aurora expedition 1902–1903 he had had the good fortune of being able to compare magnetic data from 25 observatories and argued for a doubling of this number in future. He also recommended a chain of ten small expeditions with about ten stations suitably situated about each of the magnetic poles while correlating data from all observatories in the world (Birkeland 1908).

Meteorologists too were interested in setting up a network of Arctic observatories. In 1911 Hugo Hergesell, a leading German meteorologist, introduced a permanent meteorological station on Spitsbergen, which with the start of aerological ascents in the following year produced annual series of measurements, helpful for gaining a better understanding of variations in weather conditions for further projects to introduce airships in the Arctic (Aeroarctic 1924: Table 9). Integrating single outlier observation points, however, was a problem, motivating further Arctic stations, both on land and vessels not only for systematic series of surface-bound observations but also to launch kites or balloons.

To spur further efforts in this direction the International Meteorologi-

cal Organisation created a special Commission for Polar Meteorology in 1913 (Lüdecke & Lajus 2010: 137). This coincided with the announcement by Roald Amundsen that he now finally was ready to undertake his postponed drift across the North Pole. The Commission, at its meeting in Copenhagen 28 February–1 March, 1914, on the assumption that Amundsen would at least set out in the summer of 1915, submitted a map with a plan for aerological observations at a chain of stations extending around the north polar basin (see below Fig. 1).

The inductivist ideal of science was in principle a democratic one, since it did not make a distinction between potential observers as long as they were sufficiently trained. In practice however the hierarchy of the world of scientific academies and central meteorological institutes in the different countries engendered differences when it came to whose voices counted for more than others, particularly since scientific training and specialist analysis were required in the various branches of institutionalized research in order to work up raw data from observations in the field into advanced knowledge. Here a dividing line existed between the explorer as initial observer and the scientist who made the data analysis and had the final say in matters of interpretation. This turned out to be significant in Norway where a younger generation of academically professionalised geoscientists schooled in advanced mathematical methods gained prominence. They also launched an internationally oriented journal that became influential (see below). It was a different kind of science to the one with which Amundsen was familiar (Hestmark 2004: 147); as time went on and, it seems, as he felt more and more out of place in Sverdrup's scientific context, his own passion for initiating and testing novel modes of polar exploration extended into the use of airplanes and dirigibles.

By 1927, Isaiah Bowman, director of the American Geographical Society from 1915 to 1935, in connection with a stock-taking symposium on polar research problems was able to say this about the new times:

> The whole assembly of contributions makes it clear that science, not adventure, will be the motive for future polar work. This represents a great gain for science because it forces attention on principles rather than personalities. (In Joerg (ed.) 1928: v.)

He may have had in mind Peary's words of 1904, or equally the image of Amundsen's on-going experimentation with airships to find or exclude the possibility of new polar lands from observations aloft. Bowman was from the very start a staunch advocate of academic geography as opposed to popular geography, science as distinct from only geographic exploration.

7. Framing the *Maud* Expedition in an International Context. 1914

When Amundsen had asked Nansen to help him obtain the right of use of the state-owned ship *Fram* for an extended Arctic expedition, the latter was at first reluctant since he (Nansen) had hopes of undertaking an expedition to Antarctica as the crowning event in his own life as a polar researcher. Since Amundsen used the ship to race south Nansen must have had mixed feelings and suppressed his disappointment that his own dream would never be realised—the younger prodigy had become a rival (Bomann-Larsen 1995: 226–227; Barr & Ekeberg 2005: 114). Worse still the intended potential disciple had aborted the crucially important Arctic research plan. Amundsen's own justification afterwards for the sudden change of plans was that he wanted to be in a better position to raise funds for the Arctic drift project, given the decline of public interest in the North Pole once that prize had already been reaped by Peary and Cook—by enhancing his own reputation as explorer and adding a fresh dramatic topic for lecture tours, he hoped it would be easier to raise more money.

In the foreword to Amundsen's book about the South Pole expedition Nansen stated that he hoped the author would now be able to continue his original plan for an oceanographic expedition in the Arctic. Amundsen was publicly obliged to make good his earlier promise to do just that (Hestmark 2004: 147). It was this project and not the South Pole one that fitted in with the professional interests of so many Norwegian scientists who had already invested much effort and expertise into the design of its scientific program and equipment. They had also worked on trying to integrate it into a broad international framework with a parallel campaign for sustained simultaneous data collection at several other Arctic sites. So there was more at stake than just a broken promise to Nansen.

Apart from Nansen's oceanographic program, Amundsen's projected expedition to repeat an extended drift experiment in the Arctic Ocean fit into a broader scientific framework of international meteorological interests. In 1912, at a meeting of the Aerological Commission in Vienna chaired by Hergesell, the wish was expressed that Amundsen on his planned drift across the Arctic Ocean should adopt the guidelines for atmospheric measurements developed by the International Meteorological Organization (IMO). At the IMO congress in Rome the following year Hergesell again emphasised the importance of systematic collection of atmospheric data in the Arctic involving several nations to be synchronised with Amundsen's projected expedition. Amundsen himself was asked to become a member

of the board of the newly created Commission for Polar Meteorology. During a visit to meet Hergesell at his institute in Strasbourg Amundsen was briefed on the broader picture and from his side he indicated that he might be able to obtain funding from the Carnegie Institute in the USA to set up an atmospheric observatory in the American North-West (Lüdecke 2011: 112–113). Thus he became directly involved in the network planning that culminated in the map of projected stations produced for the commission meeting in Copenhagen in 1914 (for the map, see Fig. 1).

Apart from lobbying for financial assistance, on his lecturing tours he was also on the lookout for suitable persons to recruit. One such person turned out to be Wilhelm Filchner, the leader of the Second German Polar Expedition (on the Norwegian ship *Bjørn*, renamed *Deutschland* 1911–1912). While in Berlin in February 1914 Amundsen met Filchner, outlined his new expedition plan, and invited him to participate in reconnaissance and aerial surveys using an airplane (off the ship), an idea that had been entertained earlier and was once again actualised. Amundsen, remember, had a pilot's licence and Filchner also learned to fly and obtained one. In addition Filchner learned to operate a movie camera. For the final preparations for the expedition Amundsen asked his new companion to move to Kristiania (Oslo) and it appears the latter might have done so had it not been for the outbreak of the First World War (Lüdecke 2011: 113–114). Filchner himself, writing in 1922, recalls that he intended

> to proceed to neutral Norway, where I was to receive training as an oceanographer, since in the meantime I had been recruited by Roald Amundsen for his extended arctic voyage. (Filchner [1922] 1994: vii.)

During part of the war he later found himself stationed in Norway doing military intelligence work for the Germans, which put him in a rather delicate situation since he formally still regarded himself as a member of Amundsen's projected expedition. Eventually he was asked to leave the country.

For the scientific communities that were supportive of the expedition the expectation appears to have been one of linking the old inductivist ideal of the first polar year (IPY-1) to mathematically more sophisticated and hypothesis-oriented approaches in the geosciences. Here the Norwegian geophysicist Vilhelm Bjerknes was a pivotal figure whose approach in principle spanned over several disciplines (Friedman 2008). The dynamic research networks he created simultaneously bridged empirical and theoretical dimensions of investigation.

Early on Bjerknes realized that one could formulate a complete set of hydro- and thermodynamic equations that govern the processes in the at-

mosphere. Consequently he tackled the problem of weather prediction as an initial value problem of mathematical physics, where the initial state was to be determined from observations, and the future change from integration of the governing equations. In 1905 he got the opportunity to lecture about this bold program in Washington D.C. This resulted in a yearly grant from the Carnegie Institution, which he retained for about 35 years, until the Second World War. Over the years these funds enabled Bjerknes to employ a considerable number of research assistants all of whom later became well-known geophysicists (Eliasson 1982: 3). A common denominator lay in Bjerknes' unified approach to the study of the dynamics of the motions of the atmosphere and water circulation in the oceans, friction, turbulence and energy balance (Hestmark 2004: 147). He spearheaded the establishment of an exact science of atmospheric and ocean circulation.

In 1907 Vilhelm Bjerknes was called to a chair at the University of Kristiania/Oslo. Since he was also affiliated with the Carnegie Institute in Washington D.C. he soon employed two young Norwegian science students as his Carnegie assistants: Theodor Hesselberg and Olaf Devik. Harald Ulrik Sverdrup succeeded the latter in 1911 (Friedman 2002). These three rose to prominence in different fields: Hesselberg in meteorology, Sverdrup in oceanography, and Devik in hydrology. Hesselberg eventually became the president of the IMO (1935–1946). At the end of the nineteenth century Scandinavia was the centre of marine science (Fogg 1992: 195), and this tradition was further developed and modernized, particularly in Bergen, where Bjerknes (after five years in Leipzig) moved in 1917 to join Helland-Hansen, who had become professor of oceanography there two years earlier. Undergraduate students had for some time already come from several countries to receive training in new geophysical methods in Bergen. One of these was Alexander Kuchin from Russia, who Helland-Hansen sent along on the *Fram* expedition to the South Pole to do oceanography.

7.1 The First Arctic Drift Plan as Published in 1914

After Amundsen returned from the Antarctic and revived his scheme, the little network of polar meteorologists developed the plan for co-operation to anchor it more firmly in the institutional framework of the IMO. It called for a network of up to 20 geophysical stations in the Arctic, to operate for at least one year or even two years in parallel with Amundsen's intended lengthy north polar drift in the *Maud*, which was meant to enter the ice on a trajectory north of Pt. Barrow Alaska (Fig. 1).

Observations were to be made simultaneously (ensured through radio contact) on a daily basis during the year September 1915–September 1916 with similar observations to be made by Amundsen during his intended

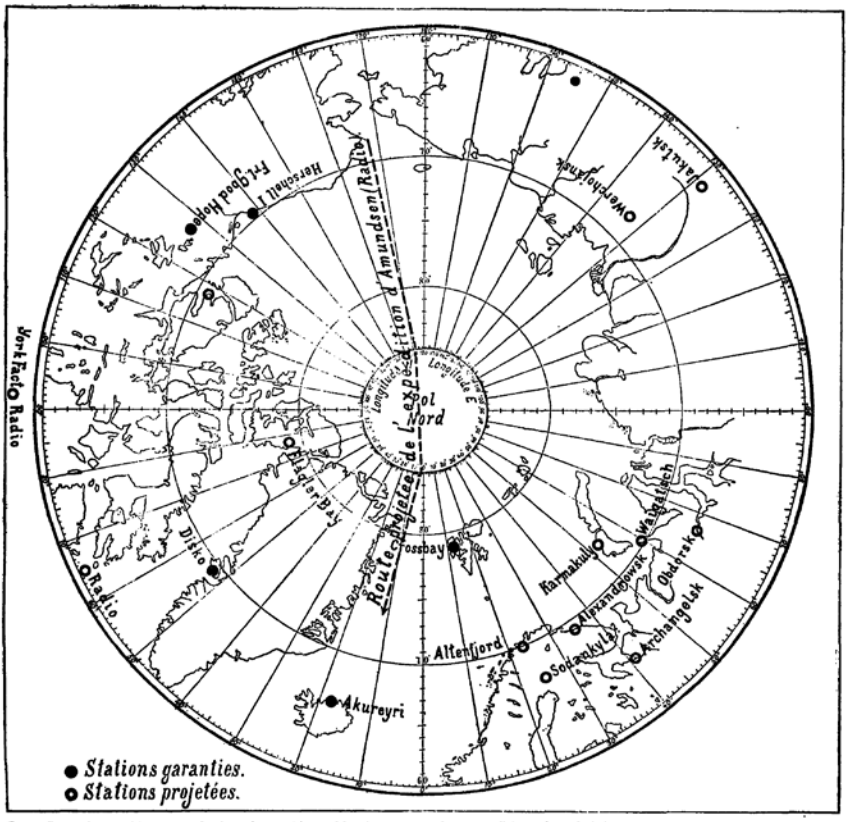


Fig. 1.—Proposed route of Capt. Amundsen's arctic expedition, and location of stations that are to collaborate in aerological observations. (From Bulletin Imp. Acad Sci., St. Petersburg, April 1, 1914. For English spelling of names see text.)

Fig. 1. Proposed route of Amundsen's Arctic expedition, and location of stations that were meant to collaborate in aerological observations (Talman 1914).

north polar drift. Membership of the Commission for Polar Meteorology reflected the nations to be involved (Talman 1914): A.I. Rykachev (president; he had once been an assistant to H. Wild and succeeded him as director of the Physical Observatory in St. Petersburg), R. Amundsen (Norway), H. Hergesell (Germany), C. Ryder (Denmark), R. F. Stupart (Canada), B. Birkeland (Norway), Prince Boris Golitsyn (Director of the Russian Meteorological Service), A. de Quervain (Switzerland), and A. Wegener (secretary, Germany).

It is noteworthy that the Russians were apparently geared up to play an important role, with three fully equipped primary stations, one on Novaya Zemlya and four secondary ones across its vast Arctic territories. Canada intended to equip four stations, the Danes were to take part on the west coast of Greenland and at Akureyri in Iceland, the Germans would use their

observatory at Cross Bay, Spitsbergen, and it was hoped that the Scandinavians would participate with two Arctic observatories (Altenfjord and Sodankylä), while an American expedition in Greenland would also take part.

7.2 The Second, Updated and Extended Plan for Co-Operation with Amundsen for 1920–1922

Five months after the IMO's Commission for Polar Meteorology at its meeting on 28 February–1 March 1914 in Copenhagen formally decided upon the co-operative plan, it had to be postponed because of the First World War. When Amundsen finally did manage to start it was in June 1918; the *Maud* was provided with the latest meteorological and oceanographic equipment as well as instruments for measuring terrestrial magnetism. H. U. Sverdrup was to supervise the scientific program, and in the meantime the plan for external international cooperation had been updated and extended for the years 1920–1922 (Norwegian Geophysical Commission 1921). The new co-operative plan was duly endorsed at the meeting of the International Meteorological Committee (IMC) in London in July 1919 and in October the same year at the important meeting in Paris when committees within the IMO were reconstituted, an International Polar Commission was established to lead the projected co-operation with Amundsen's expedition. The days when aerological balloon ascents from the *Maud* would be launched were now fixed as the international days for launching similar atmospheric probes all over the world (Hesselberg 1921: 4).

The resolution that the IMC passed at its London meeting states:

> It is agreed that the members present will do their best to secure favourable consideration of the co-operation of their representative Institutes on the lines of the proposal passed by the Norwegian Government. (Cited in Hesselberg 1921.)

Thus it is clear that the Norwegian Geophysical Commission and with it the new generation of professional mathematically minded geophysicists in Norway had a leading role in the efforts to integrate the experiments on Amundsen's expedition into an internationally coordinated observational network.

Further, when the IMO's Commission for Scientific Aeronautics was reconstituted in Paris in 1919 as the Commission for the Investigation of the Upper Atmosphere, it was Vilhelm Bjerknes who was appointed as its president. The International Polar Commission subsequently joined forces with the Commission for the Réseau Mondiale. The latter was responsible

for coordinating observations at a worldwide network of meteorological stations and synthesizing the results in annual catalogues published in London. The joint Commission for the Réseau Mondiale and Polar Meteorology later was the one within the IMO that decided on the feasibility of a Second International Polar Year, IPY-2 (Elzinga 2009; Elzinga 2010; for the history of the polar years, see Barr & Lüdecke (eds.) 2010).

7.3 A New Multilingual Norwegian Journal Enters on the Scene

Norwegian networking through existing international organizations had a good base in a consolidation of a domestic network that began when Nansen and Helland-Hansen were able to find funding for a chair for Vilhelm Bjerknes in Bergen,[7] starting in 1917. The very same year Bjerknes and

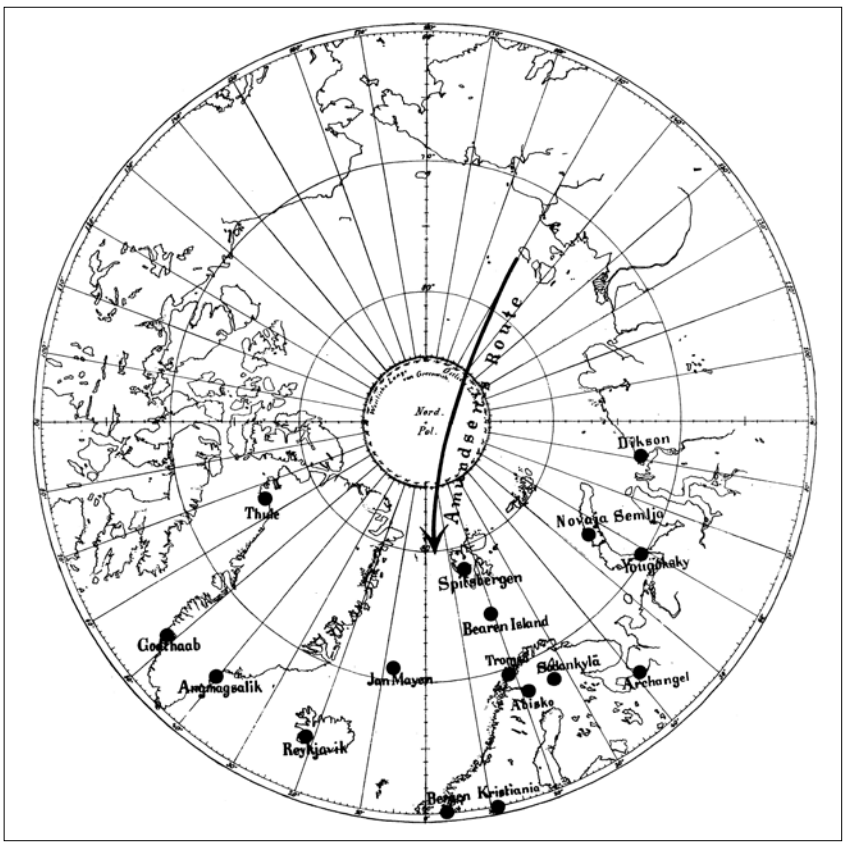


Fig. 2. The updated map 1919/1920 for the projected co-operation with Amundsen's *Maud* expedition showing the intended modified route (Hesselberg 1921).

Helland-Hansen together with their younger colleagues, O. Devik, T. Hesselberg, O.A. Krogness, H. U. Sverdrup and S. Sæland founded the Norwegian Geophysical Society and decided to create a journal, *Geofysiske Publikasjoner.* This journal started up in 1921 with private capital and an idea of linking scientific and practical concerns, while at the same it helped profile the Norwegian geophysical research community. It also put Norwegian geosciences squarely on the world scientific map, since it served as an independent periodical outlet for publications in English, French and German.

The decision to make the journal multilingual was propitious. In the cold war in science that followed upon the heals of the First World War when the international institutional landscape of science was reconstituted under the auspices of the International Research Council (IRC), it excluded researchers from the losing side, that is, researchers from the Central Powers (this situation that was not rectified until the advent of ICSU in 1931). Like Holland, Switzerland and Sweden, a neutral country like Norway played an important role in seeking to reconciliate scientific communities in the spirit of a truer internationalism; in this conjuncture the new journal filled an important gap that in turn helped it flourish.

Consciously or not the move also resonated with Nansen's newfound role as an international ambassador of peace. At the same time a more conscious international promotion of Norwegian geosciences might also have helped win goodwill during the later growth of *ishavsimperialisme* ['Polar-sea imperialism'] (Barr 2003; Drivenes 2004) that was even played up on Greenland during IPY-2.

The first issue of *Geofysiske Publikasjoner* featured several papers by the enthusiastic core group of Norwegian geoscientists reiterating the importance of arranging for the earlier idea of international co-operation with the *Maud* expedition. Theodor Hesselberg (1921), Ole Andreas Krogness (1921) and Carl Størmer (1921), respectively, outlined detailed guidelines for scheduling the synchronous study of several geophysical parameters over a sufficiently long period of time. Hesselberg's paper features a map of proposed co-operative stations, updating the earlier map of 1914 (see Fig. 2). Bjerknes meanwhile had been arguing for a network of polar observations stations patterned on the model of field weather services, the *Réseau Mondiale*, but smaller and not just for terrestrial observations. The trick was to get a sufficient number of stations for meaningful comparison of simultaneous polar upper air observations with pilot balloons (Friedman 1989: 120).

In later years the *Geofysiske Publikasjoner* featured papers in which the analysis of the results of Amundsen's *Gjøa* expedition were finally disseminated (Geelmuyden 1932; Graarud 1932; Steen *et al*. 1930; Steen *et al.* 1933). The journal was also important as an organ for disseminating some scien-

tific outcomes of the *Maud* expedition, for example, Finn Malmgren's study of humidity and hoarfrost (Malmgren 1927) and Sverdrup's analysis relating to observations of tidal motions and other oceanographic parameters off the Siberian coast (Sverdrup 1927a), both of which will be taken up below.

8. Scientific Outcomes of Amundsen's Various Expeditions and Projects

The previous sections have established the fact that Amundsen did not operate independently of the scientific community. The legitimacy of his expeditions, the design of their scientific plans and also the possibility of incorporating empirical results into the body of existing scientific knowledge all hinged on a positive attitude on the part of working scientists.

In order to highlight the outcomes of the various expeditions I have chosen not to follow them in chronological order but rather to use the disciplinary headings that were relevant at the time. This does imply an occasional repetition of events, but on the other hand that is necessary in order to do justice to the richness of the story line and reflect the internal coherence of the overall plot in which *several* actors appear. A helpful entry is a retrospective stocktaking perspective afforded by a symposium held towards the end of 1927 at the invitation of the American Geographical Society (AGS). The proceedings were published in a volume entitled *Problems of Polar Research. A Series of Papers by Thirty-One Authors* (Joerg (ed.) 1928); a companion volume contains an encyclopaedic overview of what was known about the climate, physical characteristics and regional geography of polar regions (Nordenskjöld & Mecking 1928).

The symposium was on problems of polar research. Thirty papers were presented by leading scientific authorities from different parts of the world covering a diverse number of topics. Fridtjof Nansen addressed the topic of oceanographic problems in still unknown Arctic regions (Nansen 1928). Knud Rasmussen spoke about tasks for future research in Eskimo culture, and Vilhjalmur Stefansson about the resources of the Arctic and the problem of their utilization. Louis Agricola Bauer, the longstanding head of the Department for Terrestrial Magnetism at the well-known Carnegie Institute of Washington D.C.—a world centre in the field—reviewed unresolved problems in terrestrial magnetism in Polar Regions. Longstanding enthusiasts employed by this department in those days used to be called "the magnetics."

Sir Douglas Mawson spoke on unresolved problems of Antarctic exploration and research, and Erich von Drygalski on the oceanographic problems of the Antarctic, complementing Nansen's paper. Griffith Tay-

lor, geologist on Scott's *Terra Nova* expedition, dealt with climatic relations between Antarctica and Australia, while R. E. Priestley, another former member of that expedition, took up geological problems of Antarctica. R. E. Priestley and C. S. Wright, also once members of Scott's expedition, took up problems of ice in Antarctica. A further topic was the use of aircraft in polar-regions, dealt with in papers by Richard Byrd (Antarctic), Lincoln Ellsworth (airplanes and airships in the Arctic) and Umberto Nobile (dirigibles and polar exploration).

Several other speakers covered questions mostly related to data from the Arctic and problems concerning tides, geology, meteorology, classification of sea ice and zoogeography.

The symposium volume provides an informative window onto the state of the art of polar research and its agendas at the time. Here and there one also finds evidence of a positive reception of the outcome of at least two of Amundsen's expeditions, the one with the *Gjøa* and the other with the *Maud*. Notable at the 1927 symposium is a scarcity of references to Amundsen's south polar expedition 1910–1912, while coverage of scientific results that emanated from Scott's ill-fated parallel expedition is richly represented. Ellsworth and Nobile took up Amundsen's later interest in facilitating airplanes and dirigibles as new modes of polar transport as well as logistical tools and platforms for performing airborne research.

Curiously, Amundsen himself did not attend the symposium. He had been in the US on a contract with several institutions, including the AGS, for a five month lecturing tour starting in the autumn of 1927, but broke it off abruptly after only three weeks. A visit with (and positive words for) his old mentor Cook of the *Belgica* expedition, who happened to be in jail for fraud, was picked up by newspaper reporters who featured Amundsen as now siding with Cook in the latter's controversy with Peary over who had reached the North Pole first. Since the AGS backed Admiral Peary, critical comments followed indicating that Amundsen was a meddler, which Amundsen in turn took as an affront and slander thrown in his face (Bomann-Larsen 1995: 486–487). He abruptly broke off his lecturing program and immediately left for Norway, where he isolated himself in his house nursing bitterness over this latest turn of events and how, earlier, Nobile had stolen the limelight and dampened public interest in Amundsen's story about the success of the transpolar flight with the dirigible *Norge*.

In the meantime he had also landed himself in trouble with the Royal Geographic Society in London. In his autobiography that had just appeared in print he not only attacked his rival Nobile but also referred to an episode at a formal dinner after a lecture he had given at the RGS after his return from the South Pole. Allegedly there had been three cheers, not for Amund-

sen but for his sledge dogs, a clever bit of sarcasm he had not forgotten. In his autobiography he commented on it, saying that the British were "bad losers," alluding to British national chauvinist opinion after Scott's loss of the race to the pole. The statement led to furore in Britain and a warning that if he Amundsen did not apologize, his status as honorary member of the society would be revoked. This in turn prompted Amundsen to immediately reply with a letter wherein he formally renounced his title.

Late in December 1927 Nansen, at the request of the Norwegian ambassador in London to dampen diplomatic turmoil that might be damaging for Norway, wrote a letter to the vice president of the Royal Geographical Society to explain that Amundsen had become mentally unbalanced and could no longer be held accountable for his behaviour. The legend had become a tragic isolated figure.

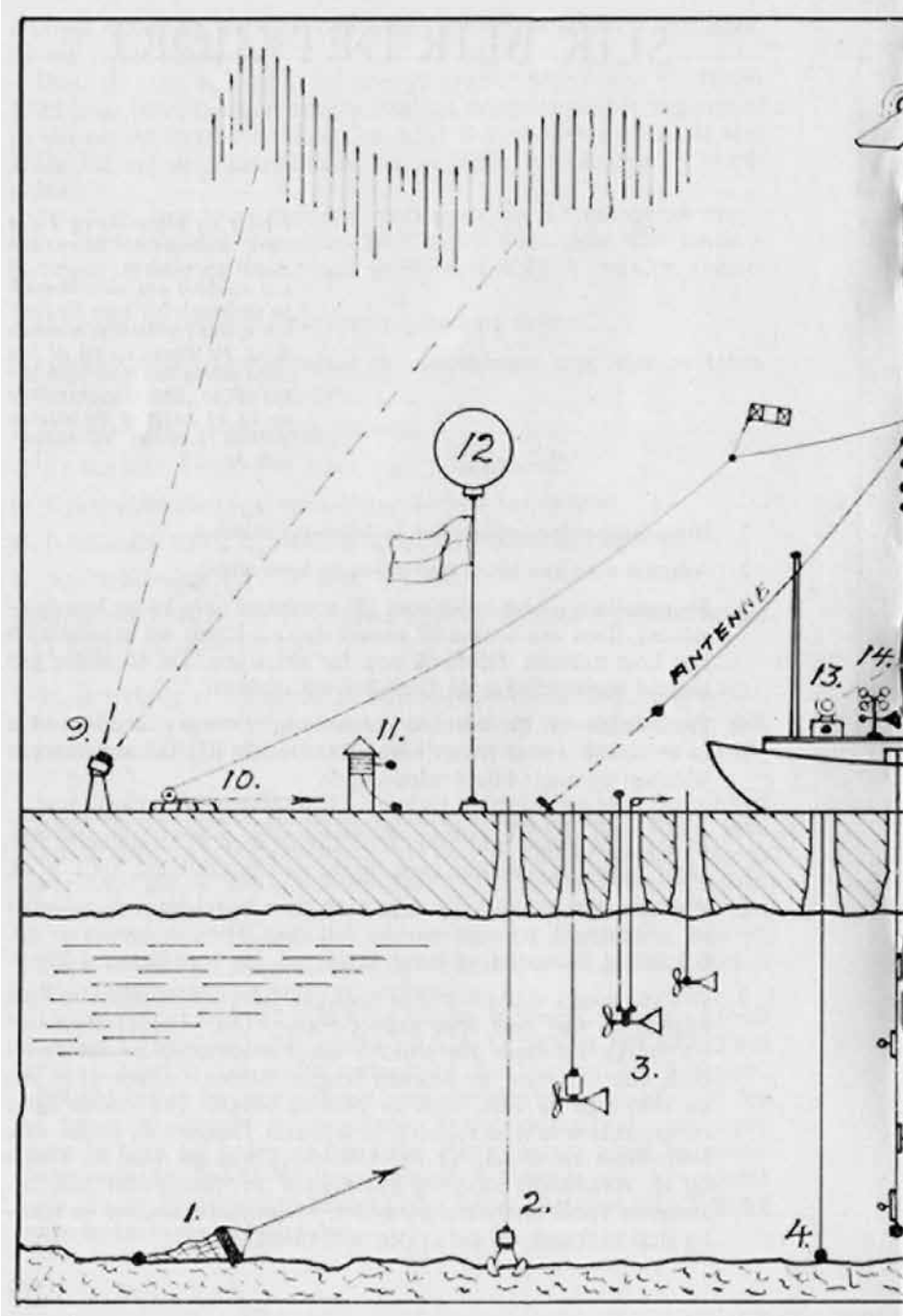
In what follows the 1927 AGS symposium report is used to help focus and summarize, and complemented with information from other sources, to thematize scientific results from the various expeditions and projects associated with Roald Amundsen over a period covering the first three decades of the nineteenth century.

8.1 Polar Oceanography and Arctic Tides

From April to September 1901, Amundsen made his first cruise in the *Gjøa*, in the Barents Sea and the Arctic regions of the Norwegian Sea. The results of his oceanographic observations were soon afterwards described and discussed by Nansen (1906). In a later report one reads that Amundsen's oceanographic observations are of great importance, and are much more trustworthy than those of any previous expedition to the Arctic Seas. His vertical series of temperatures and salinities taken in the sea between Jan Mayen, Greenland and Spitsbergen, are of special value, as they clearly prove the manner in which the bottom-water of the Norwegian Sea is formed (Helland-Hansen & Nansen 1909).

The empirical data collected at Gjoa Haven (just north of the mainland coastal rim of present-day Nunavut) was largely focused on earth magnetism and meteorology while oceanographic work was absent. The success of finding a way through the Northwest Passage rightly belongs to the art of navigation and mapping, as do the surveys of the land and coastal area near Gjoa Haven.

The plan of the oceanographic work during the Norwegian South Polar Expedition was designed together with Helland-Hansen. While Amundsen and his companions were passing the winter down south, Captain Thorvald Nilsen in the *Fram* had his second mate Hjalmar Fredrik Gjertsen together with the young Russian oceanographic researcher, Alexander Kuchin,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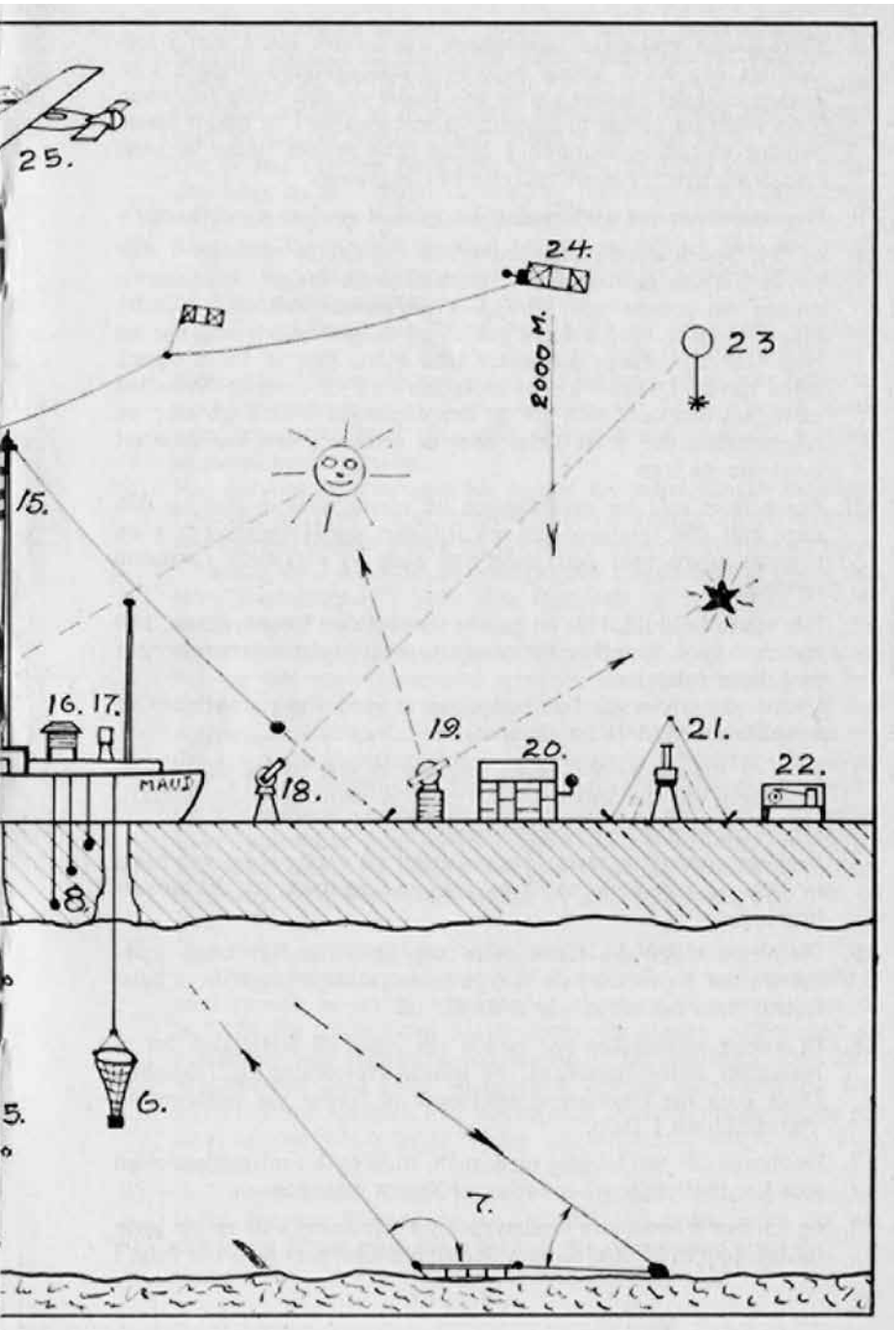

Fig. 3. Odd Dahl's drawing of the *Maud* as a polar laboratory (from Dahl & Lunde 1976: 24–25; courtesy of the Norwegian Polar Institute, Tromsø).

collect a series of data on the ocean on a double traverse back and forth between South America and Africa. Kuchin had been trained for the profession in Helland-Hansen's laboratory and Gjertsen had also received instruction there. In sixty locations they recorded temperatures, took water samples and specimens of plankton in this little-known region down to a depth of 2,000 fathoms or more.

When the *Fram* got back to Buenos Aires before heading south to pick up Amundsen and his men, Kuchin disembarked with all the samples and data, taking these with him by steamer back to Bergen and the laboratory where he made a preliminary analysis which was then taken over by Helland-Hansen. Analysis of the *Fram*'s overall oceanographic work appears in a report jointly authored by Helland-Hansen and Nansen; in it they highlight a number of interesting features in parts of the north and south Atlantic regions (Appendix V in Amundsen 1912). It was noted that at the time, the two sections covered in the Southern Atlantic were the first such ever so investigated in that region, thus adding new knowledge about previously unknown ocean depths; indeed for a while they were the longest and most complete sections known in any part of the ocean (Barr 1985: 408). These results were later compared and built on in a more detailed investigation by the German Atlantic Expedition of the *Meteor* 1925–1927 (Lüdecke 2011: 109); using a new device, the radio echo sounder, it was able to reach much deeper. Also noteworthy was the fact that the *Fram* on her voyage also reached the latitude of 78° 41' S, the furthest south a ship had ever penetrated.

As for Kuchin, after finishing in Bergen he returned to Russia. On the strength of his research training and having been chosen as Amundsen's oceanographer on the *Fram*, he was engaged in a Russian survey expedition on Svalbard and soon advanced to lead an oceanographic mission in the Arctic. His vessel was shipwrecked and he is presumed to have died in or near the Kara Sea late in 1912, thus clipping short a promising scientific career (Barr 1985: 409–412).

The *Maud* expedition that followed represented the latest state-of-the art seagoing laboratory (see Fig. 3). Since the time of Nansen's transpolar drift several new instruments had been developed, making it possible to obtain much more exact measurements of currents and tidal motions. It was now possible to more precisely determine water temperatures at many levels in the sea right down to the bottom;[8] bottom sediments could also be brought up from the Arctic sea basin. Although it failed to repeat Nansen's drift over the central Arctic Basin, thanks to Harald Ulrik Sverdrup, the *Maud* expedition nevertheless carried out a great amount of oceanographic work in the course of seven years in the ice north of Eastern Siberia and the

Bering Strait (cf. Friedman 1994; for highlights as well as photographs of different facets of the expedition see Barr & Ekeberg 2005: 181–222).

The tidal data collected during the first phase of the expedition was worked on by J. E. Fjeldstad, who predicted the existence of submarine barriers across the Arctic Ocean, such as the Lomonosov Ridge, later found by Russian scientists. He incorporated Sverdrup's preliminary tidal observations into a larger co-tidal map of the Arctic seas (Fjelstad 1923). During the second phase of the expedition Sverdrup engaged the assistance of the inventive airplane pilot Otto Dahl to construct novel current recorders (Sverdrup & Dahl 1926).

While on the *Maud*, Sverdrup also began theoretical studies applying dynamics to oceanography. He constructed a co-tidal map showing the properties of the tide between Cape Chelyuskin and Point Barrow, which differs from Harris' (1911) map. This led him "to conclude that the tidal phenomena do not indicate the existence of land within the unexplored area." He found tidal currents of the northern Siberian shelf to have a rotary, almost circular, character at considerable distances from the coast, all of them in a clockwise direction, indicating an effect of the deflecting force of the Earth's rotation. His hydrographic study of the behaviour of the tide wave on continental shelves took into account both the effect of the resistance along the bottom and the effect of the deflecting force of the Earth's rotation. The tide wave on continental shelves does not progress in accordance with the simple formula valid for deep oceanic basins. This was a novel and important finding (Marmer 1928). Sverdrup argued that the effect of the earth's rotation, a fundamental effect in the dynamics of oceans, is most simply observed in the Arctic.

The foregoing results and other findings were elaborated in *The Norwegian North Polar Expedition with the 'Maud,' 1918–1925*, a major publication in several volumes edited by Sverdrup (1928–1933; meteorology 1930, vol. 3) who was responsible for about two-thirds of the total contents.

8.2 Polar Meteorology

During eighteen months a couple of men of the *Gjøa* expedition carried out meteorological observations three times every twenty-four hours at Gjoa Haven. All the data was brought back to Oslo where it was to be reduced and interpreted. As time went on several of those scientists who had been tasked to do this died, and also the war intervened, so that coherent scientific results and discussion were not ready in manuscript form until 1922. Then post-war financial difficulties caused a further delay so that the results, after having been critically examined and revised by H. U. Sverdrup in 1931, first saw publication only in 1932. The relevant volume comprises

well over two hundred pages with discussion, synoptic maps and accompanying tabulations of primary data (Graarud 1932). However, by that time the relevance of all this material was rather incidental. Paradoxically, the isolated local meteorological data, being of good quality and forming a continuous series over a considerable period of time, may be more useful today as an ingredient in climatological studies that compare past data from neighbouring sources (e.g., Hudson's Bay Company stations and logbooks of ships both further east and west) in the Canadian north.

During the Norwegian Antarctic Expedition meteorological observations of several parameters plus cloud conditions three times a day (08, 14 and 20 hrs.) were made at the base station *Framheim* for the period April 1911–January 1912. The tabulations were analysed and climatological implications drawn by B. J. Birkeland (Appendix II in Amundsen 1912). A more detailed analysis was made by Norway's grand old man of meteorology Henrik Mohn (1835–1916). It was published in a much longer report by the Science Academy in Oslo (Mohn 1915).

During 1918–1920 the *Maud* expedition recorded full meteorological observations three times a day (at 08, 14 and 20 hrs.). These and other original records for the expedition's first phase were lost when two members of the party tried to transport the records home following the coastline of the Siberian tundra 900 kilometres to Port Dikson where there was a radiotelegraphic weather station and died en route (Barr 1983).[9]

For the second phase, 1922–1925, when Sverdrup had Finn Malmgren and Odd Dahl to assist him, the meteorological records were more comprehensive with six observations per day. Records of the first one-year portion of this period have been digitized at the National Climate Data Centre (NCDC) in the USA where there is interest in expanding this, also using published records from Sverdrup's expedition report (Sverdrup 1928–1933, vol. 3).

Unlike Amundsen, Sverdrup did not leave data analysis to others. Tore Gjelsvik (director of the Norsk Polarinstitutt 1960–1983) in a review of Norwegian research in the Arctic has this to say:

> Sverdrup's work on the *Maud* expedition represents one of the most fundamental contributions to arctic meteorology. It may be mentioned that by means of recording instruments carried aloft by kites, he succeeded in giving a detailed picture of the inversion over the pack ice. Furthermore, by means of pilot-balloon soundings, he obtained valuable information about the wind conditions at different levels of the arctic troposphere. (Gjelsvik 1966: 71.)

Finn Malmgren, moreover, apart from his work on humidity and hoar-frost (Malmgren 1926a), made a thorough and groundbreaking study of the prop-

erties of sea ice (Malmgren 1927, doctoral thesis at Uppsala). Amundsen further facilitated Malmgren's career when the explorer engaged him as meteorologist on the flight of the *Norge* across the North Pole to Alaska (Malmgren 1926b).

After the return of the *Maud* expedition Malmgren spent almost four months in the winter of 1925–1926 in Bergen where he acquainted himself with Bjerknes' new methods of synoptic meteorology. Thus he was well equipped for his next task, the flight with the airship *Norge* across the North Pole in May 1926. In this connection a novel arrangement was introduced. During the period of the flight weather telegrams from different countries were collected in Oslo where they were "synthesized" and sent on through a telegraphic cable to Stavanger. From there the powerful Radio Stavanger whose voice could be heard clear across the entire Arctic Ocean, even in Alaska, periodic reports seven times a day were sent to the *Norge*. There they formed the basis of the synoptic weather maps Malmgren plotted three times a day while en route in the airship (Malmgren 1926b: 241–242). The arrangement may be counted as a technoscientific innovation that probably encouraged visionaries of Arctic aviation by airships (Aeroarctic 1924; and see below, section 8.5).

8.3 Terrestrial Magnetism and Electricity

One of Amundsen's objectives with the *Gjøa* expedition was to determine the location and the extent of the migration of the Magnetic North Pole since its discovery by James Clark Ross in June 1831. During the stay at Gjoa Haven magnetic measurements were made continuously at the base station and intermittently in a circle of auxiliary magnetic stations around the main station to consider local and daily variations. At the time the Northern Magnetic Pole (NMP) was located on Boothia Peninsula (then called *Boothia Felix*) about 120 kilometres in a southeasterly direction from Gjoa Haven; Amundsen and Peder Ristvedt reached its vicinity by sled in April 1904, making measurements on the way. The NMP site turned out to be not far from the place at which James Clark Ross had first found it 73 years earlier; during the course of the twentieth century it has migrated northwestward at an average rate of about 10 kilometres/year. Those who later made the analysis back in Oslo expressed regrets that Amundsen was unable to make intended observations at several other locations including Victoria Harbour, Ross's headquarters in 1831 (Steen *et al*. 1933: 192). Although the total material of the field observations was considerable, the number of stations on Boothia Peninsula was too small to draw reliable conclusions about local variations over time or draw relevant magnetic charts for the region neighbouring the approximate NMP in the year 1905. At most what

was established were the more or less probable (not the exact) geographic coordinates of the magnetic pole at the given time. Most of the work at the Gjoa Haven fixed magnetic hut and later at King Point on the Yukon coast of the Canadian Beaufort Sea was done by Amundsen's assistant Gustav Wiik. Often left alone with this task while others were out on various side-expeditions, he sometimes felt that he was the one who was largely responsible for securing the expedition's scientific goal. Since he became sick, died and was buried by his last post at King Point in late March 1906 before the ship could travel on he has been referred to as a martyr of science (Bomann-Larsen 1995: 84–85).[10]

After his return to Europe Amundsen presented some of his findings before the Royal Geographical Society in London, whose members applauded him for putting the interests of science before geographical exploits (Amundsen 1907). The precise results however again took way too long before they entered the scientific literature.

Aksel Steen directed work on the vast amount of data and started preparing publication of the results. After he died in 1915 younger colleagues took over and it took another seven years before a publishable manuscript was finally put in order. As in the case of the meteorological report, the Norwegian government's financial difficulties then halted further progress. It was not until after Amundsen's death that the results of the expedition (after revisions made by H. U. Sverdrup in 1931) were published in two substantial volumes funded by Roald Amundsen's Memorial Fund (Editorial Committee 1932). One volume contains 191 images of photograms taken by the self-registering instruments at Gjoa Haven and King Point (Steen *et al*. 1930); the other contains lengthy tabulations, data analysis and interpretation (Steen *et al*. 1933). Together they comprise over five hundred pages. A very short report gives pertinent data and discussion regarding observations with astronomic instruments to determine exact times and geographical coordinates (Geelmuyden 1932).

Afterwards the scientific results seem to have gained some use once they were incorporated and compared with those from other sites in later studies, and today they are utilized in modern research on solar wind patterns (Svalgaard & Cliver 2002; Svalgaard & Cliver 2006). Solar research expert Leif Svalgaard in Houston Texas has emphasized the importance of such past data (Svalgaard & Cliver 2007: section 7) and says Amundsen's Gjoa Haven data is of very good quality (Svalgaard, personal communication 17 January 2011).

The report of the *Fram* expedition to Antarctica contains no record of earth magnetic measurements. The *Maud* expedition on the other hand delivered many interesting results that were soon circulated in relevant sci-

entific communities thanks to Sverdrup's personal contact with the "magneticians" at the Carnegie Institute of Washington and his ability to get things published. Results from the first phase of the expedition appeared quickly (Sverdrup & Duvall 1922), followed by analytical papers (Sverdrup 1927a; Wait & Sverdrup 1927; see also Fisk & Fleming 1928), and a voluminous publication in the Terrestrial Magnetism series of the Carnegie Institute (Sverdrup 1929b). L. A. Bauer was quite familiar with these when he spoke at the 1927 symposium on problems of polar research (Bauer 1928). He gave a snapshot of essential findings and commended Sverdrup for having obtained valuable continuous records for the magnetic declination both at winter quarters near Cape Chelyuskin, Siberia October 1918 to August 1919 and again at the winter site 1924/25 further west near A. E. Nordenskiöld's location in 1879, making for interesting comparison of magnetic declination over time.

During the latter phase of the expedition (1922–1925, without Amundsen) observations were made at numerous stations on the ice at remote distances from the ship and isomagnetic lines were constructed. Measured values of the magnetic declination differed significantly from those on charts but matched fairly well with Nordenskiöld's forty years earlier. Bauer notes how

> [i]t would have added greatly to our knowledge of the supposed measurements of the magnetic pole if similar magnetic-observatory observations could have been obtained simultaneously at several stations surrounding the magnetic pole.

The ambitious plan of 1919/1920 for a network of co-operating magnetic and meteorological observatories as outlined by Norwegian geoscientists and endorsed by the IMO (see above) had apparently fallen through.

Bauer also noted how in 1924 the idea of simultaneous studies in the high latitudes was promoted at the Section of Terrestrial Magnetism and Electricity of the International Geodesic and Geophysical Union (IGGU) and likewise by the Commission of Solar Terrestrial Relationships of the IRC 1925. The discovery that year of the height of ionosphere layers (Breit & Tuve 1926) spurred the study of a correlation between "polar lights and radiotelegraphy" to further probe the effects of magnetic storms. Such research gained much prominence, not least with E. V. Appleton's work in Tromsø during IPY-2 (Elzinga 2009). For his investigations of the physics of the upper atmosphere with an ionosonde and his discovery of a new ionosphere layer Appleton was awarded the Nobel Prize in physics in 1947.

The study of aurora during the *Maud* expedition was qualitative. No parallactic photographic equipment had been taken along to measure their

height above the Earth. However, on the basis of his studies Sverdrup confirmed that aurora displays are always accompanied by magnetic disturbance whose severity increases, in general, with the intensity of the movement of the aurora. He further found that the intensity of magnetic disturbance decreased with increasing altitude of the aurora.

A thorough treatment of relevant empirical and theoretical work on the magnetic material was published in the expedition volume (Sverdrup 1928–1933). For contemporaries it set a high standard, not only because of the continuous data sets but also for the theoretical twists Sverdrup was able to add.

With his scientific reputation established with the *Maud* (Nierenberg 1996) and partly in recognition of what he had accomplished for Norway during seven hard and sometimes frustrating years in the Arctic,[11] in 1926 Sverdrup was offered the chair of meteorology after Bjerknes, who had moved to Oslo. In Bergen Sverdrup found more time to work on the data collected and edited the scientific report of 1933. Before assuming his post, however, he spent ten months at the Carnegie Institute in Washington, among other things, to work on the expedition's electric and magnetic records and publish the report cited by Bauer. Consequently those records—data collections, computation notebooks, charts, tables, reports and 68 aurora borealis photographs—can be found in the Institute's archives, where processing and organizing them was completed by Jennifer Snyder in 2004 (Carnegie Institution 2004).

8.4 Ethnography

Amundsen was a fairly astute and respectful ethnographer of the Netsilik Inuits. The men of the *Gjøa* befriended the local Netsilik and seem to have left a favourable impression with them. This has recently been evidenced in studies of anecdotal knowledge transmitted over the years by local tribal Elders (Eber 2008). Elders still actualize oral historical memories transmitted in their society from the time of the explorers, including Amundsen. The indigenous people in their encounters 1903–1905 called him "Amusi" (pronounced Amuse-uh); several stories concerning the big-nosed "Amusi" and his men still circulate today (Eber 2008: 116).

The Norwegian party were not the first *kabloona* (Inuktitut for 'non-Inuit person') the Netsilik community had encountered, but they were certainly friendlier than some other Europeans who had sought a way through the Passage on many earlier occasions. They even set about to learn Inuit skills of various kinds, including the construction of igloos, adopting indigenous clothing and joining their native hosts on hunting parties. In addition they learnt how to hunt for seal and native methods of preparing food,

as well as how to cope with extreme weather conditions that might arise, and in some cases as guests they slept in Inuit homes. By rewarding individual members of the native community with much prized items of wood and metal in exchange for exemplars of Inuit dress, tools and other artefacts like shamanistic and ritual objects, Amundsen introduced an incentive system whereby it became easier to assemble a large collection of ethnographic materials. Inuits were also encouraged to bring in various kinds of birds for the expedition's ornithological collection. As a result, thanks to the assistance of local communities on King William Island and elsewhere, the expeditioners were able to bring a variety of unique material and photographs back to Oslo, where the ethnographic part came to form the backbone of the Ethnographic Museum's Inuit collection. The Netsilik collection, with over 900 items, is held to be the Museum's largest from a single culture (Walter & Neumann Fridman (eds.) 2004: 176). To this was later added a valuable collection of objects from the Chuckchi people of easternmost Siberia obtained during the *Maud* expedition.

In a recent historical review of Amundsen's achievements the *Gjøa*-collection brought back from the Northwest Passage is referred to as that expedition's perhaps most interesting scientific result (Barr & Ekeberg 2005: 83); at the time it was given to the Museum it constituted the biggest single collection of Inuit objects anywhere (Jølle 2004: 299). However, it was never used for research purposes to the extent hoped for; by 1918 it was eclipsed by a much stronger (politically motivated) interest in the life and culture of Norway's own Arctic minority or "polar people," the Sami. Thus the Ethnographic Museum in Oslo never became a centre for studies of Inuit culture. In Copenhagen, Denmark, on the other hand, Knud Rasmussen's collections from his Thule expeditions became the basis for a world centre of Inuit research, politically motivated by the Danish claim to Greenland.

At the 1927 symposium on polar research problems Rasmussen noted that "in Oslo there is the rich collection brought home by the *Gjøa* expedition from the neighbourhood of the north magnetic pole," but said nothing about Amundsen's ethnographic observations (in Joerg (ed.) 1928: 186).

The popular account of the *Gjøa* expedition (Amundsen 1908), translated into many languages, is laced with observations of the amateur ethnographer. It recounts encounters with the Netsilik, has observations on their customs, modes of transport over land and water, interpersonal relations, generational differences, women, and shows respect for and an appreciation of indigenous knowledge. Some of the photographs taken during the expedition are also featured (cf. Barr & Ekeberg 2005: 92, 95–96). In his book Amundsen says he warned his men against giving in to the temptation of getting too intimate with young Eskimo women. The collective memory

of the Netsilik suggests that this advice was not always followed.

In her book *Encounters on the Passage. Inuit Meet the Explorers* (2008), one of anthropologist Dorothy Eber's Inuit informants says: "there was a lot of sexual activity;" another tells her that

> in Gjoa Haven a number of persons lay claim to Norwegian heritage [...]. I never heard it directly from my father himself, but when I was a child close relatives would sometimes say, 'your father is a half white person—mixed with white.' (Eber 2008: 124.)

In the wake of centennial celebration marking the visit of the men of the *Gjøa* some of these memories of the past kept alive in the local lore of a multifaceted oral tradition are probably surfacing again. Today Gjoa Haven has a population of about 1,000; in 2010 community leaders in cooperation with the Fram Museum in Oslo had an Amundsen celebration that featured an exhibition of some of the unique historical photos taken over a century ago.

During the course of the first phase of the *Maud* expedition, which was essentially a transit of the Northeast Passage (1918–1920), Amundsen kept a diary. In it his own observations regarding the Chuckhi are limited to practical matters like their ability to handle sledge dogs or their clothing and personalities plus his general view that they had a morally high stature, but because they were so isolated they culturally stood far below the level of the Alaskan Inuit who had adopted much more from the surrounding white society.

Sverdrup was the one who, on Amundsen's suggestion, spent eight months living and travelling with the Chuckchi and carried out extensive ethnographic work among them. Although less pronounced, his approach also reflected a Darwinist cultural evolutionary perspective that was prevalent in the 1910s and 1920s. The *leitmotif* of the study as he expressed it, was the duty of his generation to use every opportunity

> to save whatever can be saved; collect information about life and thought forms, especially among those people who still find themselves at the edge of civilization; because in a few decades their way of life may also have changed, their uniqueness disappeared. We must learn to know these people, but it must occur soon. (Stated in Sverdrup's chapter in Amundsen 1921.)

Sverdrup's study is more concentrated and professional than Amundsen's earlier one of the Netsilik Inuits and presents a systematic review of similar aspects like tools and dress forms. He also discusses questions of social

structure and genealogy (who may marry whom), accepted forms of homosexuality, norms more generally, traditional forms of trade, justice, manifestations of intra-tribal and family solidarity as well as marriage customs and funeral rites. A substantial part of the study takes up belief in supernatural causes of earthly events which might influence a person's (mis)fortune, well-being or not, and various healing practices in cases of sickness. Names of powerful and capricious spirits abound, while on the other hand curiously because there is no word or name for it, toothache does not exist. Shamanistic practices are also discussed.

Sverdrup's account was first incorporated as a long chapter (*Blandt rentsjuktsjere og lamuter* ['Among the reindeer Chukchi and the Lamut']) in Amundsen's expedition report (Amundsen 1921); subsequently he published a paper in English, "Customs of the Chukchi natives of north-eastern Siberia" (Sverdrup 1922). Thereafter came popular books in Norwegian, *Tre Ar i isen med "Maud"* ['Three years in the ice with the "Maud"'] (Sverdrup 1926) and *Hos Tundra-Folket* ['Among the tundra people'] (Sverdrup 1938). Although he lectured on the subject in English while in the USA, broad dissemination in print to an Anglophone readership had to wait forty years while a manuscript based on *Tundra-Folket* lay at the Scripps Institution of Oceanography, La Jolla, California, where Sverdrup served as director 1936–1948. When finally it had been translated, edited and published (Sverdrup 1978) there existed more authoritative studies of the Chuckchi reindeer herders so the volume had a limited impact.

8.5 Arctic Exploration by Airplane and Airship

The last phase of Amundsen's life was spent in new feats of polar exploration involving air travel, with some sensationally novel projects. In late 1922 when it became clear that the *Maud* would not reach the North Pole, he hit upon an alternative strategy—long distance flight. The idea emerged already when he was momentarily in Norway. Arnesen (1929: 121) dates it to March 1922.

After the *Maud* headed north again and got stuck in the ice and overwintered once more off the coast of Siberia it headed for Seattle with a damaged propeller. A year later after repairs the ship set out again in June 1922 to continue the second phase of the expedition (1922–1925). This time it had two small planes on board, one of which, a German-made Junkers-Larsen JL-6 called *Elisabeth*[12] was transferred to a schooner and deposited at Wainwright (near Port Barrow) together with Amundsen, who stayed behind there in northern Alaska from where, with his pilot Oskar Omdal of the Royal Norwegian Navy, he planned to fly over the Arctic Ocean to Spitsbergen. Take-off proved impossible that summer and autumn because

of strong winds and storms, so the pair ended up building a house and Omdal stayed the winter in Wainwright with the plane stored in boxes. Amundsen found the place boring and travelled by dog sled to the gold-digger town of Nome where he spent the winter (becoming a well-known figure in local social life) before returning to Wainwright where bad luck continued in the spring of 1923 (Jensen 2011: 244–248). The *Elisabeth* crashed during its test flight, and after attempts to repair the undercarriage failed, Amundsen got fed up, and so by midsummer the entire plan was abandoned. Amundsen then stayed behind in the USA to raise money for further aviation projects. Meanwhile Oscar Wisting, now in command of the *Maud*, was once more in the pack ice for the intended transpolar drift that also failed.

The second plane was an American Curtis plane named the *Kristina*. Together with the pilot Odd Dahl it stayed on the *Maud* and was able to carry out two short reconnaissance flights; during a third flight it crashed on the ice (Wisting 2011: 405–406). Nevertheless it was a pioneering effort that added knowledge about off-ship flights in Polar Regions.

Dahl was employed by Amundsen in 1922 as pilot, mechanic, radio telegrapher and film-photographer on board the *Maud*. Together with the newly recruited Finn Malmgren he also assisted Sverdrup. Dahl maintained and constructed scientific instruments and proved to be a good illustrator and draftsman. In later life he declared: "the 'Maud' was my university and H. U. Sverdrup my professor."[13] In 1927 Sverdrup helped him get a position to assist geophysicists at the Carnegie Institute in Washington, the start of a scientific career that led on to Dahl's later prominence in Norwegian and European atomic and space research.

In 1925 Amundsen had the good fortune of being called upon by Lincoln Ellsworth (the son of an American millionaire). He wanted to become a member of Amundsen's new expedition to reach the North Pole; Amundsen agreed since it meant much needed financial support (Jensen 2011: 258–259). This time the starting point was Spitsbergen using two Dornier Wal flying boats. They landed in a water lead in the pack ice (a polynya) at 87° 44' N. When the lead closed up it took twenty-five days of hard work before one plane was freed and now with six persons on board flew back to Spitsbergen. In his presentation at the 1927 symposium on polar research problems, Ellsworth says:

> [t]he scientific results, from the expedition that cost 150,000 dollars, consisted in viewing 120 square miles of hitherto unknown territory and taking two soundings with a Behm echo sounding machine which showed a depth of the polar basin at that point to be 3,750 metres (12,300 feet), thus precluding the likelihood of any land in the sector between the north pole and Greenland-Spitsbergen. In addition the flight had

> shown that meteorological conditions prevailing over the Arctic Basin offered no hindrance to its successful exploration by the proper kind of aircraft. (In Joerg (ed.) 1928: 410–411.)

The following year Amundsen and Ellsworth contracted the Italian airship pioneer, Umberto Nobile, to buy his dirigible that they christened the *Norge*.[14] In May 1926 the airship successfully flew from Spitsbergen, over the North Pole, and landed at Teller Alaska 72 hours after take-off. This was another first in the history of polar aviation. Photographs made during the flight further confirmed the absence of an unknown land.

It was a dramatic moment. Take-off was just two days after Richard Byrd had flown towards the pole with a plane and came back to Spitsbergen claiming he had reached it. In retrospect, since recent analysis of Byrd's technical records and meteorological conditions indicate that he could not possible have got beyond 89°, and recent perusals of Peary's and Cook's records indicate that they also fell short, the Amundsen team now after all appears to have been the first to cross the pole. Hence Roald Amundsen and Oscar Wisting (who in 1911 helped plant the Norwegian flagpole at the South Pole) were actually the first men to reach both poles.

Finn Malmgren, the meteorologist on the *Norge*, on the basis of his findings concluded that future traffic over the polar sea, if it was to materialize, would not be with dirigibles but with airplanes (Malmgren 1926b: 250). This was because of the problem with strong winds and icing that created dangerously risky situations for dirigibles. It was an insight that was tragically confirmed two years later with the crash of Nobile's *Italia* in the aftermath of which Malmgren lost his life out on the sea-ice, and Amundsen died during a search-and-rescue flight out of Tromsø. An extract from Malmgren's diary while on the *Italia* has recently been published as an appendix in Nencioni (2010: 128–131).[15]

Despite the tragedy of the *Italia*, the vision of airships as research platforms developed further within the network of enthusiasts organized by the Aeroarctic (1924), a society for promoting Arctic aviation (Nansen was its president and Sverdrup was also on its Board).[16] The idea got a momentary boost with the partial success of the flight, July 1931, of the society's airship, the LZ-127 Graf Zeppelin in a five day polar flight with a team of German, Swedish, Soviet and US scientists on an exploration of the Arctic (Sverdrup 1929a). Arthur Koestler (1952) was on board as one of the journalists for the press agency Ullstein that had a monopoly on reports to the media.[17]

Apart from meteorological observations, scientists measured variations in the earth's magnetic field in the latitudes near the North Pole, and made a photographic survey of unmapped regions using a panoramic camera that automatically took several pictures per minute. A massive aerial survey and

mapping of the Russian Arctic was achieved, but the Zeppelin never became the research platform that was envisaged by some.

Speaking at the symposium in December 1927, Nobile covered several problems attending the use of dirigibles in Polar Regions. He recognized the dangers of fog and ice encrustation of the airships and spoke of the need to protect against falling chunks of ice from hitting and tearing the gasbag. Further he discussed the need to protect motors and gas valves against low temperatures. Still, he held that all such problems could be solved and then went on to try and refute those who dismissed the use of dirigibles as platforms for scientific research; against them he argued why

> the dirigible is the best means of transportation for the exploration of the Arctic zone. The airplanes and hydroplane can be used, but mainly as an auxiliary means of transportation. (In Joerg (ed.) 1928: 424.)

In an overly optimistic tone he outlined a futuristic scenario where larger dirigibles might be used to transport entire laboratories for use in Polar Regions. History proved him wrong; in 1952 Arthur Koestler summarized: "Just as the dinosaur represented the end product of withered branch of development, it was too clumpy, vulnerable and slow" (Koestler 1952). The vision nevertheless was an important part of an episode wherein Amundsen had an important role as a man of action and facilitator.

One final aspect to be mentioned here is Amundsen's role in the development of a solar compass for aviators. In 1923 he commissioned the engineer and inventor Johann Boykow to construct a solar compass as a navigational aid for flying near the North Pole where magnetic compasses become unreliable (Aeroarctic 1924: 47; Lüdecke 2011: 144). The small instrument was designed to follow the daily rotation of the sun, and in the case of a constant course project the image of the sun at a fixed place on a frosted glass in front of the pilot. The instrument was manufactured by the C. P. Goerz Co. in Germany. In the hands of the Norwegian aviation pioneer Hjalmer Riiser-Larsen, who served as Amundsen's pilot during the N 25 Dornier Wal flight and navigator on the *Norge* flight, it was used to calculate aerial routes fairly accurately in cloudless skies (Riiser-Larsen 1926). It was Riiser-Larsen's careful monitoring of the compass and factoring in wind drift that decided when they were actually over the Earth's mathematical North Pole.

Nobile used a new version of this solar compass on the flight of the *Italia* and thereafter the *Graf Zeppelin* also navigated by it while over the Arctic Ocean. Even the two Dornier-Wal hydroplanes used during the German Swabenland Expedition to Antarctica 1938–1939 used the Goerz solar compass.

On the basis of archival findings historian of polar science Cornelia Lüdecke says Amundsen deserves credit for the initiative behind this technical innovation and that it could have become a lasting contribution to polar navigation had it not been for the fact that the mainstream technical development in this area took another path (Lüdecke 2011: 200–201).

9. Photography

In September 2006 Christies in London at their auction sold a consignment of several boxes containing photographs taken during three of Amundsen's expeditions, the *Gjøa*, the South Pole Expedition and the one with the *Maud*. They were clubbed at £78,000. They were the "direct positive glass lantern slides" which are the subject of Roland Huntford's book, *The Amundsen Photographs* (1987).

Long regarded as lost the hand-coloured slides were discovered in 1986 in the attic of Amundsen's nephew's widow Anne-Christine Jacobsen in Oslo. A box marked "Horlicks Malted Milk Tablets" turned out to contain not field rations but 248 of Amundsen's original lantern slides, apparently the only more or less complete set to have survived. Compared to Robert Scott, who employed the professional photographer and cinematographer Herbert Ponting, who as "camera artist" took over one thousand pictures on the *Terra Nova* expedition, Amundsen was the happy amateur when it came to recording his exploits. He almost missed getting any pictures at all from his own South Pole expedition, since the camera he had taken along was damaged and the film did not turn out. Fortunately, Olav Bjaaland brought his personal camera along, which saved the day, especially when it came to the iconic image of four men in front of the tent at *Polheim*.[18]

On the other hand Amundsen did bring a film camera. With it various sequences in the South Polar expedition were shot, first when the *Fram* was being loaded before departure, then underway and when arriving at the Bay of Whales. Gradually Kristian Prestrud took over and he filmed the "caravan" of the five men with their four dogsleds as they disappeared into the horizon on their way to the pole. Then when the group is back and the *Fram* in March 1912 is about to leave for Hobart he filmed a sequence where one can catch a glimpse of penguins at the Ross Barrier and further away the ship *Kainan Maru* of the Japanese expedition. Amundsen used the documentary in various versions in connection with lectures after his return to Norway.[19] One such lecture is reproduced in a recent booklet produced by the Norwegian Film Institute in connection with the restoration of the film for popular distribution (Norsk Filminstitutt 2010: 155–166). Since 2005 the film, now entitled Amundsen's South Pole Expedition 1910–1912 is listed as

one of the world heritage films in Unesco's Memory of the World Register.

The legacy of the *Maud* expedition includes many photographs and some filmed episodes. In this case again there were no professional photographers present, but pictures were taken here and there in amateur fashion. In a sense this is ironic because, like many other private venture explorers, Amundsen was very dependent on publicity to help raise funds to finance his enterprises, including the later ones with airplanes. As already noted, it meant he had to spend a lot of time touring the world giving lectures.

The pilot and mechanic Oskar Omdal took photographs of the tiny plane *Elisabeth* unpacked in Alaska for the initial attempt to fly to Spitsbergen from there, and we can see images of it and the result of the crash immediately upon take-off. Odd Dahl took some footage on the plane *Kristina* used on the second phase of the *Maud* expedition. These and other images were incorporated into Reidar Lund's expedition film *With Roald Amundsen's North Pole Expedition to its first Winter Camp* (1923), which also features ethnographic sequences of the life of the Chukchi people and scenes on board the *Maud*.

Later Omdal shot several film rolls on the flight of the two Dornier Wal hydroplanes that almost reached 88° North in 1925. It includes scenes of the breakdown in the ice-scape. Combined with his own footage from flight preparations on Spitsbergen and the triumphant return to Oslo showing crowds of dressed-up people waving flags in large and small boats cheering the N-25 in the harbour, Paul Berge turned this into the popular educational film *Roald Amundsen. Lincoln Ellsworth's Polar Flight 1925*. The approach of the on-site film photographer was documentary, since he rarely had the opportunity to capture dramatic situations and moreover it was held that the matter-of fact representation of ordinary events during an expedition provided a truer picture of the explorer's reality.

Later Amundsen's flight film was reworked for an American market in a totally different way with a reordering of sequences and new clippings to accentuate drama and mimic the approach of a newsreel feature. In a recent book published by the Norwegian Film Institute in Oslo Jan Anders Diesen carefully analyses the composition of the aforementioned films and discusses the shift from the documentary to the dramatic approach (Diesen 2010).

When lecturing Amundsen was most comfortable with the documentary style, which also influenced his lectures regarding the South Pole expedition. Here the hand-coloured glass slides were an important visual aid. At the same time, as Huntford notes, there was a positive side to all this:

> He was a man of action, with an almost naive faith in his deeds necessarily speaking for themselves [...]. He and his companions took pictures

> themselves as they felt the need. In this alone they were amateurs, and their work was undoubtedly that of the snapshot [rather than the carefully posed composition]. Whatever the drawbacks in presentation, this did at least register events as seen through their own eyes. The outcome is a poignant blend of immediacy, artlessness and authenticity. This happens to suit Amundsen's style. (Huntford 1987: 7–8.)

The meaning conveyed however does not emerge purely out of the pictures themselves, as Huntford seems to suggest. The lecturer and his orchestration of the invisible hand that coloured the glass slides also contributed to what a member of the public might "see."

Recent research into Amundsen's use of visual material indicates that for his lectures he preferred to use the most retouched and coloured glass diapositives, which probably allowed for greater flexibility in his popular presentations. It is also found that there are a number of different versions of the iconic image of the four men in front of the tent and that these versions differ from each other in some interesting respects. Amundsen's favourite version was the one touched up in Norway with more colour and a straighter Norwegian flag when one compares to an earlier Australian version showing "the slackness of both the flag and Amundsen's belly" (Lund 2010: 174). The latter, a rather brownish image, was produced in Hobart, Tasmania. It is also a copy of the "original" authentic print that seems to be lost. A comparison of the different versions of the iconic photograph opens for some interesting interpretative flexibility that shows how the construction of meaning is not independent of socio-political context. In his analysis Lund writes:

> The South Pole picture with a more discreet flag shape not only shows that the wind is weaker at the South Pole [than suggested in the retouched Norwegian diapositive]. The wealth of detail and the context also appears liberating in relationship to the nationalistic overtones the picture has gained in Norwegian settings. (Lund 2010: 178.)

10. Concluding Remarks

Summing up, the purpose of the present paper has been to provide a better understanding of Roald Amundsen's problematic relationship to science. Even though he did not like to hob-knob with academics, he had a respect for science and liked Fridtjof Nansen's description of him as a scientific explorer. On the basis of a review of the expeditions and projects Amundsen was involved in during a period of three decades, it can be concluded that he was a reflective practitioner who facilitated both empirical data collection and had an impact on the life and early work of a number of persons

who were or became important scientists, H. U. Sverdrup, Finn Malmgren and Odd Dahl. Dahl made a career in cosmic and nuclear physics and then space research and technology, playing an important role also at the policy level in Europe. Lincoln Ellsworth's successful expeditions with aircraft in Antarctica may also be mentioned.

Secondly, whereas Amundsen himself at first was intimately involved in empirical data collection, especially when it came to geomagnetic observations he left it to others to do the data reduction and interpretation of the results. In his life as a reflective practitioner there was always the double agenda—namely, setting records based on first hand geographical exploration, while service to science became a kind of spinoff. It was polar adventure that created headlines and turned him into an icon, particularly after the successful South Pole mission.

Thirdly, in Sverdrup's perspective in the context of a much broader picture the race to the South Pole was incidental to the older plan to follow in Nansen's footsteps in the Arctic. The subsequent expedition with the *Maud* remained the first objective, the one of repeating Nansen's trans-Arctic drift close by the North Pole.

A fourth conclusion is that then as now, science can simultaneously serve as a means both in itself and for promoting other goals, political or personal. The dual purpose of facilitating science and leaving footprints in the snow at the North Pole or crossing it by air were both part of the complex passions that drove Amundsen.

Although neither the objective of drifting across the Arctic Ocean for seven or eight years from the Bering Strait to Greenland nor the one of planting a flag at the North Pole succeeded, the scientific results that came out of that expedition were nevertheless impressive. This was thanks to Sverdrup's resourcefulness as a scientific leader. Amundsen himself was not a scientist and never pretended to be one. He was the seasoned leader and planner—oftentimes stubborn, vain and opinionated—the reflective practitioner, a genial master of logistics, enrolled by Nansen to help facilitate science. On the *Maud* he at first took his turn equally at the instruments and in the ship's galley. After two years, however, he hopped off from his own expedition and became part of the movement to promote multiple purpose polar aviation that for a while tied in with a vision of using dirigibles as research platforms.

A close historical study of results to be found in several classical disciplines reveals that Amundsen's expeditions, especially the one with the *Maud* where he himself was only present on the first leg, but also the two expeditions with the *Gjøa*, contributed more than is commonly recognized. Magnetic data for 1 November 1903 through May 1905 from the Gjoa Haven, although they did not have much relevance when they were finally pub-

lished, are now still being used in modern day Earth and Planetary Systems Science.

A final point central to the paper's line of argument is that the plan of the expedition with the *Maud* fitted into a broader landscape of scientific institutions and contemporary interests of leading scientists. First of all there was Nansen's struggle to establish Oslo as a centre for physical oceanography that failed as Bergen (where Sverdrup became affiliated) surged ahead; secondly there was the plan of interaction with the meteorologists within the IMO. In the Amundsen story Norwegian historians of science have been instrumental in throwing new light on the Nansen-Amundsen nexus and the role of polar research and exploration in Norway's identity as a nation. Archival research has also provided a more complete picture of the context(s) and networks, and convergence of a variety of relevant stakeholder interests at play before, during and immediately after the First World War, and how in the immediate post-war period institutions in neutral countries like Norway played a special role in fostering reconciliation and promoting scientific internationalism. The present paper has not been able to do justice to the richness of the most recent scholarship pertaining to this broader context of geopolitical and cultural dimensions. The aim has been the more limited one of problematising Amundsen's ambiguous self-description as "scientific explorer" and to look more closely at knowledge and know-how that came out of his expeditions.

ACKNOWLEDGEMENTS

I want to thank Vidar Enebakk and Peder Roberts as well as two anonymous reviewers for valuable comments on a draft version of this paper.

NOTES

[1] Prestrud's group left a cairn there that is today considered to be an historic site—77° 11' S, 154° 32' W.

[2] Cook's announcement was published a week before Peary's; being a good friend since the *Belgica* expedition Cook actually suggested that Amundsen might now want to go to the South Pole instead.

[3] From Charles Darwin's diaries however we know that animal husbandry was a source of practical knowledge that played into his development of the theory of evolution.

[4] The group of Sverdrup Islands were claimed on behalf of Norway. A conflict with Canada over this Norwegian claim was not settled until 1930.

[5] On Canadian maps nowadays it is called *Gjoa Haven*, which is also the name I will use in the present text.

[6] As it turned out he only spent the first two winters on the *Maud* whereafter he left for his first trials in flying in the Arctic in 1922 and 1923.

[7] Bjerknes became a professor at Stockholm University College 1895. In 1906 he became affiliated with the Carnegie Institute in Washington D.C. as a Research Associate. In 1907 he got a professorship at the University of Oslo but after five years moved to Germany to become the founding director of the Geophysical Institute in Leipzig, Germany, where he stayed from 1913 to 1917 whereafter he returned to Norway to found the Geohysical Institute at the University in Bergen. He did not return to Oslo until 1926.

[8] Already in 1910 Nansen developed a special water sampling bottle that Amundsen was able to use during the South Pole expedition.

[9] Remnants of the private postbag were found by a Russian geologist in 1922, only to be lost again, but in the mid-1970s a covering telegram dated 15 August 1919 from Roald Amundsen to his brother Leon in Oslo mysteriously surfaced in the Moscow Central Archives, in a section containing the private archives of a former Soviet administrator, Georgy D. Krazinsky. It is not known what happened to another item, an impregnated water-tight package with a book manuscript and many photographs destined for Oslo, nor if a further similarly water-proofed package containing scientific material ever reached its destination, the Carnegie Institute of Washington in the USA (Sjparo & Sjumilov 1986; Sandholm & Reinfjord 2008).

[10] At King Point the crew of the *Gjøa* built two small houses of driftwood plus a magnetic observation hut. The marker by Wiik's grave was located at King Point where the magnetic instrument stand once stood, but since 1906 it has been moved several times because of continuous erosion of the permafrost on the Yukon coastline in the area. Five kilometres off the coast lies Herschel Island where whaling ships from 1890 onward used to overwinter. There one can find 100 wind-worn grave markers, silent witnesses to a late nineteenth century bustling Beaufort Sea whaling industry. There used to be a settlement of 1,500 people with many buildings and an Anglican Mission Church to evangelize the Inuit—in 1907 the whaling market collapsed and in the following year the island was deserted; today the few remaining houses and Herschel Island with it are top-listed in Canada as a potential Unesco heritage site.

[11] Recall that Amundsen participated only during the first two years, later on he was absent while he was planning to fly to the North Pole with an airplane, as discussed in the next section.

[12] Named after his sweatheart Kristine Elisabeth Bennett.

[13] See www.polarhistorie.no/personer/Dahl,%20Odd; access date 16 May 2012.

[14] Nobile's airship had been used by the Italian military and Amundsen was able to purchase it fairly cheaply with Ellsworth once again affording financial support (Jensen 2011: 288–289; Wisting 2011: 444–446).

[15] For a picture of the *Italia* as it flies over the royal castle in Stockholm on the way to Svalbard see Jensen (2011: 311).

[16] At the outset in 1924 the society had about one hundred persons with illustrious titles, most of them professors but also industrialists, high ranking civil servants or ministers of German governments, military men and directors of meteorological institutes and earth magnetic observatories. Some of these have been mentioned in the foregoing text (Louis A. Bauer, Bjørn Helland-Hansen, Th. Hesselberg, Otto Nordenkjöld, Knud Rasmussen and Alfred Wegener), others are ones that figured centrally in the network behind the idea and subsequent plan for the Second International Polar Year (Leonid Breitfuss, Dan Barfod Lacour, Evert van Everdingen and Johannes Georgi). In addition

one finds Sven Hedin, the Swedish explorer of desert landscapes and ruins along the fabled Silk Road; interestingly the polar explorer Roald Amundsen is missing. Nansen urged him to come to the 1924 meeting in Berlin but Amundsen refused saying that—considering Germans having caused the death of innocent Norwegian fishermen whose ships they sank during the war—he no longer wanted to have anything to do with the "German nation;" possibly he now also saw Nansen as a potential competitor in the polar skies and feared his own glory would diminish in the older man's shadow (Bomann-Larsen 1995: 413, 479). At first Germans and Scandinavians heavily dominated the Aeroarctic; by 1925/1927 an internationalization had taken place. Breitfuss edited the society's journal *Arktis* (1928–1931) with articles by several prominent scientists of the time. In 1930 Nansen's death and economic crisis led to the society's demise. For the historical and political context see De Syon (2002).

[17] Arthur Koestler's autobiography, *Arrow in the Blue* (1952) contains two chapters about the expedition; its achievements and behind the scenes personal and political conflicts are told with much humour.

[18] On the printed label within the glass are written the credits, e.g., "Prepared by J. W. Beattie Hobart Tasmania and coloured by TW Cameron, Carlton, Victoria."

[19] The longest Norwegian version is the socalled Cinema-version—it is 16 minutes.

REFERENCES

Aeroarctic (1924). *Das Luftschiff als Forschungsmittel in der Arktis. Eine Denkschrift mit vier Anlagen*, Berlin C.: Otto v. Holten Druckerei & Internationalen Studiegesellschaft zur Erforschung der Arktis mit dem Lufschiff.

Amundsen, R. (1907). *Nordvestpassagen. Beretning om Gjøa Ekspeditionen 1903–1907* ['Northwest Passage. Narrative of the Gjøa Expedition 1903–1907'], Kristiania: Aschenhough & Co.

— (1908). "Plan for en polarfærd 1910–1917" ['Plan for a polar expedition 1910–1917'], *Det Norske Geografiske Selskabs Aarbog*, 20, 1908, pp. 55–75.

— (1909). "A proposed North Polar Expedition," *The Geographical Journal*, 33:4, pp. 440–462.

— (1912). *The South Pole. An Account of the Expedition of the Norwegian Antarctic Expedition in the 'Fram' 1910–1912*, London: C. Hurst & Co.

— (1921). *Nordostpassagen* ['Northeast Passage'], Kristiania: Gylendalske Boghandel.

— (1927). *Mitt liv som polarforsker* ['My Life as a Polar Researcher], Oslo: Gyldendal.

— & Ellsworth, L. (1926). *Över polhavet* ['Across the Polar Sea'], Stockholm: Albert Bonniers Förlag.

Andersson, J. G. (1945). *Männen kring Sydpolen* ['The Men Around the South Pole'], Stockholm: Saxon & Lindströms Förlag.

Arnesen, O. (1929). *Roald Amundsen som han var* ['Roald Amundsen as he was'], Oslo: Gyldendal Norsk Forlag.

Barr, S. (2003). *Norway. A Consistent Polar Nation? Analysis of An Image Seen Through the History of the Norwegian Polar Institute*, Oslo: Kolofonforlag.

— & Ekeberg, J. O. (2005). *Roald Amundsen. Tidenes Polarfarer* ['Roald Amundsen. All-time Polar Explorer'], Oslo: Stenersens Forlag AS.

Barr, S. & Lüdecke, C. (eds.) (2010). *The History of the International Polar Years (IPYs)*, Berlin: Springer Verlag.

Barr, W. (1983). "The last journey of Peter Tessem and Paul Knutsen, 1919," *Arctic*, 36:4, pp. 311–327.

— (1985). "Alexandr Stephanovisch Kuchin. The Russian who went south with Amundsen," *Polar Record*, 22:139, pp. 401–412.

Bauer, L. A. (1928). "Unsolved problems in terrestrial magnetism and electricity in the Polar Regions", in *Problems of Polar Research. A Series of Papers by Thirty-One Authors* (American Geographical Society Special Publication 7), ed. W. L. G. Joerg, New York: American Geographical Society, pp. 53–62.

Birkeland, K. (1908). *The Norwegian Aurora Polaris Expedition, 1902–1903*, Oslo: H. Aschehaug.

Bomann-Larsen, T. (1995). *Roald Amundsen. En biografi* ['Roald Amundsen. A Biography'], Oslo: Cappelens Forlag A-S (2 vols.).

Breit G. & Tuve, M. A. (1926). "A test of the existence of a conducting layer," *Physical Review*, 28, pp. 554.

Carnegie Institution (2004). *Maud Expedition Records, 1918–1925*, Washington D.C.: Carnegie Institution of Washington Department of Terrestrial Magnetism Archives (With a Finding aid written by Jennifer Snyder. June 2004); http://carnegiescience.edu/legacy/findingaids/DTM-2004-02-Maud.html; access date 24 January 2012.

Dahl, O. & Lunde, R. (1976). *Odd Dahl og Maudferden* ['Odd Dahl and the Maud expedition'], Oslo: Aftenposten.

Decleir H. (ed.) (1998). *Roald Amundsen's Belgica Diary. The First Scientific Expedition to the Antarctic*, Antwerp: Hadewijch Publishing Co.

De Syon, G. (2002). *Zeppelin! Germany and the Airship*, Baltimore, Ma.: The Johns Hopkins University Press.

Diesen, J. D. (2010). *'For God's Sake, Save the Film Rolls.' On Amundsen and the Film from the Flight Expedition to the North Pole*, Oslo: Norsk Filminstitutt.

Drivenes, E.-A. (2004). "Ishavsimperialisme" ['Polar-sea imperialism'], in *Norsk Polarhistorie* 2, eds. E.-A. Drivenes, H. D. Jølle and K. Zachariassen, Oslo: Gyldendal Norsk Forlag AS, pp. 175–257.

— & Jølle, H. D. (eds.) (2006). *Into the Ice. The History of Norway and the Polar Regions*, Oslo: Gyldendal Norsk Forlag.

Drivenes, E.-A., Jølle, H. D. & Zachariassen, K. (eds.) (2004). *Norsk Polarhistorie* 2. *Vitenskapene*, Oslo: Gyldendal Norsk Forlag AS.

Eber, D. H. (2008). *Encounters on the Passage. Inuit Meet the Explorers*, Toronto: University of Toronto Press.

Editorial Committee (1932). "The scientific results of the Norwegian Arctic Expedition in the Gjøa 1903–1906 under the conduct of Roald Amundsen. Part I. Scientific work of the expedition," *Geofysiske Publikasjone*, 6:1, pp. 1–20 [including a map of the expedition's route].

Eliasson, A. (1982). "Vilhelm Bjerknes and his students," *Annual Review of Fluid Mechanics*, 14:1, pp. 1–11.

Elzinga, A. (2004). "Otto Nordenskjöld's quest to internationalize south-polar research," in *Antarctic Challenges. Historical and Current Perspectives on Otto Nordenskjöld's Antarctic Expedition 1901–1903*, eds. A. Elzinga, T. Nordin, D. Turner & U. Wråkberg, Göteborg: Royal Society of Arts and Sciences in Göteborg, pp. 262–290.

— (2009). "Through the lens of the polar years. Changing characteristics of polar research in historical perspective," *Polar Record*, 45:235, pp. 313–336.

— (2010). "Achievements of the Second International Polar Year," in *The History of the*

International Polar Years (IPYs), eds. S. Barr & C. Lüdecke, Berlin: Springer Verlag, pp. 211–234.

Filchner, W. [1922] (1994). *To the Sixth Continent. The Second German South Polar Expedition*, Norwich, UK: Erskine Press.

Fisk, H. W. & Fleming, J. A. (1928). "The magnetic and electric observations of the Maud expedition during 1918 to 1925," *Terrestrial Magnetism and Atmospheric Electricity*, 33:1, pp. 37–43.

Fjelstad, J. E. (1923). "Litt om tidevandet i Nordishavet" ['A bit about tides in the Arctic'], *Naturen* (Bergen), 47, pp. 161–175.

Fogg, G. E. (1992). *A History of Antarctic Science*, Cambridge: Cambridge University Press.

Friedman, R. M. (1989). *Appropriating the Weather. Vilhelm Bjerknes and the Construction of a Modern Meteorology*, Ithaca, N.Y.: Cornell University Press.

— (1994). *The Expeditions of Harald Ulrik Sverdrup: Contexts for Shaping an Ocean Science*, San Diego: Scripps Institution of Oceanography.

— (1995). "Civilization and national honour. The rise of Norwegian geophysical and cosmic science," in *Making Sense of Space. The History of Norwegian Space Activities*, ed. J. P. Collett, Oslo: Scandinavian University Press, pp. 3–39.

— (2002). "Ulrik Sverdrup (1888–1957)," in *Oceanographic History. The Pacific and Beyond*, eds. K. R. Benson & P. F. Rehbock, Seattle: University of Washington Press, pp. 17–27.

— (2004). "Nansenismen," in *Norsk Polarhistorie* 2. *Vitenskapene*, eds. E.-A. Drivenes, H. D. Jølle & K. Zachariassen, Oslo: Gyldendal Norsk Forlag AS, pp. 107–173.

— (2008), "Vilhelm Bjerknes," *New Dictionary of Scientific Biography* 1, New York: Charles Scribner's Sons, pp. 288–290.

— (2011). "Amundsen, Nansen, and the question of science. Dramatizing historical research on the polar heroic," *Endeavour*, 35:4, pp. 151–159.

Geelmuyden, H. (1932). "The scientific results of the Norwegian Arctic Expedition in the Gjøa 1903–1906 under the conduct of Roald Amundsen. Part I. Astronomy-observations arranged and reduced under the supervision of H. Geelmuyden," *Geofysiske Publikasjoner*, 6:2, pp. 21–27.

Gjelsvik, T. (1966). "Norway," *Arctic*, 19:1, pp. 70–75.

Graarud, A. (1932). "The scientific results of the Norwegian Arctic Expedition in the Gjøa 1903–1906 under the conduct of Roald Amundsen. Part I. Meteorology—observations arranged and reduced by Aage Graarud," *Geofysiske Publikasjoner*, 6:3, pp. 29–248.

Hansen, J. J. (2011). *Amundsens betrodde mann. Historien om Oscar Wisting* ['Amundsen's Right-Hand Man. The Story of Oscar Wisting'], Oslo: Schibsted Forlag.

Harris, R. A. (1911). *Arctic Tides*, Washington D.C.: US Coast and Geodetic Survey.

Helland-Hansen, B. & Nansen, F. (1909). *The Norwegian Sea and Its Physical Oceanography Based on the Norwegian Researches 1900–1904* (Report on Norwegian Fishery and Marine Investigations 2:2), Kristiania: Mallingske Bogtrykkeri.

Hesselberg, T. (1921). "On the projected co-operation with Roald Amundsen's North Polar Expedition," *Geofysiske Publikasjoner*, 1:4, pp. 1–4; www.ngfweb.no/docs/NGF_GP_Vol01_no4.pdf; access date 18 January 2012.

Hestmark, G. (2004). "Kartleggerne" ['The mapmakers'], *Norsk Polarhistorie* 2. *Vitenskapene*, eds. E.-A. Drivenes, H. D. Jølle & K. Zachariassen, Oslo: Gyldendal Norsk Forlag AS, pp. 9–103.

Hiscott, T. O. (1992). *Henry G. Bryant and the Role of the Geographical Society In Turn-of-the-*

Century Arctic Exploration, Haverford, Pa.: Haverford College; www.geographicalsociety.org/images/gspaper00200155.pdf; access date 15 January 2012.

Huntford, R. (1979). *Scott and Amundsen*, New York: Putnam.

— (1987). *The Amundsen Photographs*, London: Hudder & Stoughton.

International Polar Commission (1908). *Procès-verbaux des scéances. Présenté par G. Lecoint*, Bruxelles: Hayez.

Jensen, N. A. (2011). *Amundsen*, Copenhagen: Informationsforlag.

Joerg, W. L. G. (ed.) (1928). *Problems of Polar Research. A Series of Papers by Thirty-One Authors* (American Geographical Society Special Publication 7), New York: American Geographical Society.

Jølle, H. D. (2004). "Nordpolens nabor" ['North Pole neighbours'], in *Norsk Polarhistorie* 2. *Vitenskapene*, eds. E.-A. Drivenes, H. D. Jølle & K. Zachariassen, Oslo: Gyldendal Norsk Forlag AS, pp. 259–327.

— (2009). "Polar prestisje og vitenskaplig ære. Fridtjof Nansens kamp om havsforskning ved universitetet" ['Polar prestige and scientific honour. Fridtjof Nansen's struggle for marine research at the university'], *Historisk tidsskrift*, 88:4, pp. 611–637.

— (2011). *Nansen. Opdageren* ['Nansen. The Discoverer'], Oslo: Gyldendal.

Kløver, G. O. (ed.) (2009). *Cold Recall. Reflections of a Polar Explorer*, Oslo: The Fram Museum.

Koestler, A. (1952). *Arrow in the Blue. An Autobiography*, London: Collins.

Krogness, O. (1921). "On the importance of obtaining magnetic registrations from a comparatively close net of stations in the polar regions," *Geofysiske Publikasjoner*, 1:4, pp. 8–18.

Larsen, E. J. (2011). *An Empire of Ice. Scott, Shackleton, and the Heroic Age of Antarctic Science*, New Haven & London: Yale University Press.

Lüdecke, C. (2001). "The Belgian attempt to institutionalize polar research (1905–1915)," in *The 'Belgica' Expedition Centennial. Perspectives on Antarctic Science and History*, eds. C. de Broyer & H. Decleir, Brussels: VUB Press, pp. 161–169.

— (2008). "From the bottom of the stratosphere. Arctic climate as seen from the 1st International Polar Year (1882–1883) until the end of World War II," in *Climate Variability and Extremes During the Past 100 Years*, eds. S. Brönniman, J. Luterbacher, T. Ewen, H. F. Diaz, R. S. Stolarsky & Q. Nue, Berlin: Springer Verlag, pp. 29–45.

— (2011). *Amundsen. Ein biografisches Porträt*, Freiburg im Breisgau: Verlag Herder GmbH.

— & Lajus, J. (2010). "The Second International Polar Year 1932–1933," in *The History of the International Polar Years* (*IPYs*), eds. S. Barr & C. Lüdecke, Berlin: Springer Verlag, pp. 135–174.

Lund, H. Ø. (2010). "The South Pole photograph," *Norsk Fiminstitutt 2010*, pp. 167–178.

MacPhee, D. E. (2010). *Race to the End. Amundsen, Scott, and the Attainment of the South Pole*, New York: The American Musem of Natural History, Sterling Innovation Publishing.

Malmgren, F. (1926a). "Studies of humidity and hoar-frost over the Arctic Ocean," *Geofysiske Publikasjoner*, 4:6, pp. 2–20.

— (1926b). "Väder och vädertjänst under polflygningen" ['Weather and weather service during polar flight'], in *Över polhavet*, eds. R. Amundsen & L. Ellsworth, Stockholm: Bonniers, pp. 227–250.

— (1927). "On the properties of sea-ice," in *Norwegian North Polar Expedition with the "Maud" 1918–1925. Scientific Results* 1(5), ed. H. U. Sverdrup, Bergen: Geofysisk institut.

Marmer, H. A. (1928). "Arctic Tides," in *Problems of Polar Research. A Series of Papers by*

Thirty-One Authors (American Geographical Society Special Publication 7), ed. W. L. G. Joerg, New York: American Geographical Society, pp. 17–25.

Mohn, H. (1915). *Roald Amundsen's Antarctic Expedition. Scientific Results. Meteorology* (Videnskapsselskapets Skrifter 1), Christiania: Jacob Dybwad.

Morrell, M. & Capparell, S. (2001). *Shackleton's Way. Leadership Lessons from the Great Antarctic Explorer*, New York: Viking.

Nansen F. (1906). *Northern Waters. Captain Roald Amundsen's Oceanographic Observations in the Arctic Seas in 1901*, Kristiania: Jacob Dybwad.

— (1907). "On North Polar problems," *The Geographical Journal*, 30:5, pp. 469–487.

— (1928). "The oceanographic problems of the still unknown Arctic regions," *Problems of Polar Research. A Series of Papers by Thirty-One Authors* (American Geographical Society Special Publication 7), ed. W. L. G. Joerg, New York: American Geographical Society, pp. 3–16.

Nencioni, G. (2010). *The Italians in the Arctic Explorations. A Critique of the reinterpretation of Nationalism* (Northern Studies Monograph 2), Umeå: Umeå University & The Royal Skyttean Society.

Nierenberg, W. A. (1996). "Harald Ulrik Sverdrup, November 15, 1888–August 21, 1957," in *Biographical Memoirs* (National Academy of Sciences), 69, Washington D.C.: National Academy Press, pp. 339–376.

Nordenskjöld, O. & Mecking, L. (1928). *The Geography of the Polar Regions* (Special Publication, The American Geographical Society 8), Worcester, Ma: The Commonwealth Press.

Norsk Filminstitutt (2010). *Roald Amundsen's South Pole Expedition 1910–1912. On the Expedition Film and the Iconic Photograph*, Oslo: Norsk Filminstitutt (in collaboration with seven other sponsors).

Norwegian Geophysical Commission (1921). "Geophysical investigations in the Arctic regions in co-operation with Roald Amundsen's expedition," *Geofysiske Publikasjoner*, 1:4, pp. 5–7.

Polanyi, M. (1958). *Personal Knowledge. Towards a Post-Critical Philosophy*, Chicago: University of Chicago Press.

— (1967). *The Tacit Dimension*, New York: Anchor Books.

Riiser-Larsen, Hj. (1926). "Navigationen över polhavet" ['Navigation across the polar sea'], in *Över polhavet*, eds. R. Amundsen & L. Ellsworth, Stockholm: Albert Bonniers Förlag, pp. 169–220.

Sandholm, U. A. & Reinfjord, K. (2008). *Polarfarer Paul Knutsen. Hans liv og mystiske forsvining* ['Polar expeditioner Paul Knutsen. His life and mystical disappearance'], Brønnøysund: Temahefter.

Schetelig, J. (1912). "Provisional remarks on the examination of the geological specimens brought by Roald Amundsen's South Polar Expedition from the Antarctic continent," in *The South Pole. An Account of the Expedition of the Norwegian Antarctic Expedition in the 'Fram' 1910–1912*, R. Amundsen, London: C. Hurst & Co, Appendix III.

— (1915). *Report on the Rock-Specimens Collected on Roald Amundsen's South Pole Expedition* (Videnskapsselskapets Skrifter 4), Christiania: Jacob Dybwad.

Schon, D. (1983). *The Reflective Practitioner. How Professionals Think in Action*, London: Temple Smith.

Sjparo, D. & Sjumilov, A. (1986). *Tre arktiske mysterier* ['Three Arctic mysteries'], Oslo: Falken Forlag [Norwegian translation from the Russian original, *Tri zagadki Arktiki*, 1982].

Spencer Jones, H. (1923). "The magnetic variation in the neighbourhood of the magnetic north pole," *The Geographical Journal*, 6:6, pp. 419–423.

Steen, A. S., Russeltvedt, N. & Wasserfall, K. F. (1930). "The scientific results of the Norwegian Arctic Expedition in the Gjøa 1903–1906 under the conduct of Roald Amundsen. Part III. Terrestial magnetism photograms," *Geofysiske Publikasjoner*, 8, pp. 1–17 (including 191 Plates).

— (1933). "The scientific results of the Norwegian Arctic Expedition in the Gjøa 1903–1906 under the conduct of Roald Amundsen. Part II. Terrestial magnetism," *Geofysiske Publikasjoner*, 7:3, pp. 3–309.

Stewart, J. (1990). *Antarctica. An Encyclopedia*, 2 vols., Jefferson, N. C.: Mcfarland & Co.

Størmer, C. (1921). "The importance of taking aurora photographs from a network of stations around the polar basin in collaboration with Roald Amundsen's expedition," *Geofysiske Publikasjoner*, 1:8, pp. 25–27.

Summerhayes, C. P. (2008). "International collaboration in Antarctica. The International Polar Years, the International Geophysical Year, and the Scientific Committee on Antarctic Research," *Polar Record*, 44:231, pp. 321–334.

Svalgaard, L. & Cliver, E. (2002). "An independent assessment of solar wind conditions circa 1900 based on data obtained by the Roald Amundsen Gjoa Expedition," *Meeting Abstract*, 34th COSPAR Scientific Assembly, The Second World Space Congress, held 10–19 October, 2002 in Houston, TX, USA.

— (2006). "Interplanetary Magnetic Field Strength 1902–1913," *Proceedings of the American Geophysical Union Spring Meeting, Baltimore MD, May 2006*, Abstract #SH51A-06.

— (2007). "Interhourly variability index of geomagnetic activity and its use in deriving the long-term variation of solar wind speed," *Journal of Geophysical Research*, 112 (A10111), 32 pp.

Sverdrup, H. U. (1922). "Customs of the Chukchi natives of northeastern Siberia," *Journal of the Washington Academy of Sciences*, 12, pp. 208–212.

— (1926). *Tre Ar i isen med 'Maud'* ['Three Years in the Ice with the "Maud"'], Oslo: Gyldendal.

— (1927a). "Dynamics of tides on the North Siberian shelf," *Geofysiske publikasjoner*, 4:5, pp. 1–75.

— (1927b). "Ergebnisse der Messungen des Potentialgefälles auf der 'Maud'-Expedition," *Zeitschrift für Geophysik*, 3, pp. 93–102.

— (1928). "Minnestale over Roald Amundsen" ['Commemorate speech for Roald Amundsen'], *Norske videnskapsakademi i Oslo Arbok*, pp. 125–129.

— (1928–1933). *Norwegian North Polar Expedition with the "Maud", 1918–1925, Scientific Results*, 5 vols., Bergen: Geofysisk Institutt.

— (1929a). "Polferden med 'Graf Zeppelin'" ['Polar flight with "Graf Zeppelin"'], *Naturen* (Bergen), 53, pp. 353–367.

— (1929b). "Magnetic, atmospheric-electric, and auroral results," in *Norwegian North Polar Expedition with the "Maud", 1918–1925, Scientific Results*, Vol. 1b, Bergen: Geofysisk Institutt, pp. 309–524.

— (1938). *Hos Tundra-Folket* ['Among the Tundra People'], Gyldendal, Oslo: Gyldendal.

— (1959) "Roald Amundsen," *Arctic* 12:4, pp. 221–236 [based on the original manuscript prepared for Vilhalmur Stefansson's *Encyclopedia Arctic*a and as such archived in the special collection Dartmouth College Library, Hanover, NH, USA, where it can be accessed electronically by scrolling down to "Amundsen;" www.dartmouth.

edu/~library/digital/collections/ocn238796413/index.html; access date 15 May 2012].

— (1978). *Among the Tundra People*, La Jolla: Scripps Institution of Oceanography [translated by M. Sverdrup].

— & Dahl, O. (1926). "Two oceanographic current-recorders designed and used on the 'Maud' expedition," *Journal of the Optical Society of America*, 12:5, pp. 37–45.

Sverdrup, H. U. & Duvall, C. R. (1922). "Results of magnetic observations of the 'Maud expedition,' 1918–1921," *Terrestrial Magnetism and Atmospheric Electricity*, 27:1–2, pp. 25–56.

Sverdrup, O. [1903] (1904). *Nytt Land. Fyra år i polartrakterna* ['New Land. Four Years in Polar Regions'], Stockholm: Albert Bonniers Förlag. [Swedish translation from the 1903 Norwegian edition.]

Talman, C. F. (1914). "Notes from the Weather Bureau Library," *Monthly Weather Review*, Vol. 42 (March 1914), pp. 181–182 (map reproduced from *Bulletin of the Imperial Academy of Sciences in St. Petersburg*, April 1, 1914).

Walter, M. N. & Neumann Fridman, E. J. (eds.) (2004). *Shamanism. An Encyclopedia of World Beliefs, Practice and Culture*, Santa Barbara, Ca.: ABC-CLIO.

Wait, G. R. & Sverdrup, H. U. (1927). "Preliminary note on electromotive forces possibly produced by the earth's rotating magnetic field and on observed diurnal-variation of the atmospheric potential-gradient," *Terrestrial Magnetism and Atmospheric Electricity*, 32:2, pp. 73–83.

Wisting, A. (2011). *Roald Amundsen. Det største eventyret* ['Roald Amundsen. The Greatest Adventure'], Oslo: Kagge Forlag.

Miscellanea: Notes/Notizen

Lisbeth Lewander (1956–2012)

Lisbeth Lewander passed away 2 January 2012 at Rönnäng, Tjörn, a small municipality on the west coast of Sweden. That is where she preferred to live with her family, commuting back and forth to the University of Gothenburg where she was an Associate Professor and head of the Department of Gender Studies, which was later incorporated in a very large department for Cultural Sciences that she also headed. She lived to be 56 years.

After taking a basic degree in political science and international relations Lewander completed her PhD with a thesis (2004) on the politics of polar matters. The title of her thesis is *Polariseringens politik. Studier av nation och kön* ['The politics of polarisation. Studies on nation and gender']. She was one of the first scholars in Scandinavia to apply gender studies and the concept of masculinity as a lens to polar expeditions and research, for example, in a study regarding a number of hitherto "forgotten" events in Otto Nordenskjöld's Antarctic Expedition of 1902–1903. She also took the lead in using formerly secret archival Foreign Ministry material to refute the longstanding accepted idealized portrayal of the Norwegian–British–Swedish Antarctic Expedition of 1949–1952 as a model of a truly international enterprise free from politics. In an important study she demonstrated the relevance of Cold War national security policy and its complex nature as a context that has to be taken into account even in this seemingly altruistic case of research in faraway Antarctica.

Further, Lisbeth Lewander was one of the first scholars to take up the changing perceptions of risk in the history of polar exploration and research, illustrating how physical and environmental risks regularly occurred in the past in ways that would never be accepted today. In her last few years, despite bouts of illness, she travelled widely in the Arctic to interview a large variety of persons involved from different angles as stakeholders and decision-makers in recent developments linked to threats and opportunities afforded by global warming, the retreat of sea ice, and the quest of the Arctic rim countries to extend exploitation of natural resources in the area; in this connection she highlighted and analysed regional concerns of governance and the aspirations and rights of indigenous circumpolar peoples. In addition, under the auspices of the fourth international polar year she managed a couple of projects that have contributed to public understanding of science in the polar regions. One was the travelling exhibition *Iskalla uppdrag* ['Ice cold missions'] on Sweden's involvement in polar years and other expeditions past and present. The other is a series of illustrated digital texts accessible as a "polar portal" via the library of the University of Gothenburg (www.ub.gu.se/portaler/polarportalen/). It covers the history of major Swedish polar expeditions and associated pioneering personalities in polar science.

Lisbeth Lewander was a member of the editorial advisory board of this journal (*Journal of Northern Studies*), and also a member of the History Group of the Scientific Committee on Antarctic Research (SCAR), participating in many of

its international symposia. She was also active in the research program Nordic Spaces. We are many in our field that sincerely miss her as a dedicated courageous scholar and generous colleague.

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Reviews/Comptes rendus/Besprechungen

REVIEW ESSAY
Changing Trends in Remembering Amundsen and Scott

Ross D. E. MacPhee, *Race to the End. Amundsen, Scott, and the Attainment of the South Pole*, New York: Sterling Publishing Co. 2010, ISBN 9781402770296, 245 pp. plus panorama foldout plates and map;
Edward J. Larson, *An Empire of Ice. Scott, Shackleton, and the Heroic Age of Antarctic Science*, New Haven & London: Yale University Press 2011, ISBN 9780300154085, 288 pp.;
Cornelia Lüdecke, *Roald Amundsen. Ein biografisches Porträt*, Freiburg–Basel–Wien: Verlag Herder GmbH 2011, ISBN 9783451062247, 208 pp.

The past couple of years have seen publication of several books dealing with the epic drama of men struggling with Nature and each other to be the first to reach the geographic South Pole. Roald Amundsen and four companions, citizens of a newly independent Norway were the first to make it, reaping the prize before the rival party of Robert Falcon Scott did. Amundsen had officially set out to repeat Fridtjof Nansen's experiment of locking his ship the *Fram* in the Arctic sea ice to follow its drift and undertake original oceanographic research, but he had the audacity to change his mind and head for the South Pole, thereby challenging Scott whose expedition had the backing of the British Empire.

The outcome is well known. Amundsen's superior planning, know-how regarding survival under polar conditions and efficient use of Inuit style clothing and dogsleds won the day over Scott's naval tradition of man hauling, poorer clothing and insufficient preparations. Amundsen made it back to civilization to announce his own achievement; Scott and his four companions froze to death near a depot they were unable to reach on their return to base-camp. Both men had their names inscribed in the history of their respective nations, symbolizing respectively the ingenuity and prowess of a newly independent nation on the rise and the onset perhaps of the decline of the world's biggest imperial power at that time.

Both Norway and the UK have made their national heroes the focal points of many events commemorating the "conquest" of the South Pole. From 2010 onward into 2012 there have been exhibitions and seminars of various kinds commemorating the Amundsen and Scott expeditions. A team of skiers from Norway has re-enacted Amundsen's trek to the pole. They left the Bay of Whales on

the Ross Ice Shelf on 1 October 2011 and two of them made it all the way to the pole by 14 December; two others had to be flown in the last 80 kilometres. A British group paying tribute to Scott and his men traced the original rescue party's tracks from Hut Point to Scott's final camp where they met up with several other persons flown in for a memorial ceremony.

Nowadays well trained sportsmen and adventurers pulling lightweight sleds made of new composite materials, packing dry-frozen foods, very light tents and sometimes using sails and the latest ski equipment have made it to the Pole, intermittently in contact by satellite telephone with people back home and writing daily reports with pictures inserted in blogs. In case of mishaps support for airborne rescue may be called upon. The situation is quite different from what it was one hundred years ago. This struck me when I was in Tromsø on 14 December 2011.

The national celebration of Amundsen's South Pole achievement took place that day in Tromsø, Northern Norway, where the Norwegian Polar Institute is now located. Festivities included the unveiling next to the Polar activity centre (Polaria) of a statue depicting Helmer Hansen in front of a dogsled; Hansen, an ice skipper, was a native of Northern Norway and the lead sledge-driver on the trek to the Pole.

A polar parade went through the streets of Tromsø to Stortorget, the city's main square where there was an outdoor stage with a large screen accommodating musical performances and activities for children. Through a satellite hook-up one could see images of the Norwegian Prime Minister Jens Stoltenberg and hear his voice in direct transmission from the South Pole as he was speaking with members of the Norwegian team who had reached that site on skis. Haakon, Crown Prince of Norway was on stage in Tromsø and interacted from there directly via satellite transmission with Stoltenberg and the other Norwegians at the South Pole asking the latter various questions about their trip.

Being in Tromsø the previous day for a one day long seminar on Amundsen's exploits and various facets in his life, I stayed on for the big celebration. Witnessing the media event at Stortorget I came to think of the vast change in conditions of polar exploration and research wrought by a century of successive technological developments, most recently satellite communications, Internet and multimedia. Messages that one hundred years ago took months to reach people back home now come with only a few seconds delay, and in situ pictures on top of that.

When Amundsen and his four men reached the South Pole, news of his achievement only reached world capitals three months later, in early March 1912, after he had sent a telegram away immediately when his ship *Fram* docked in Hobart, Tasmania, on its return from Antarctica.

Scott and his men approached the Pole on 17 January, 1912, thus well after Amundsen; on the 18th they surveyed the area and came across the tent that Amundsen had erected, complete with a note to Scott and a request to convey a letter to Norway's King Haakon. Word that Scott's party had also reached the pole but perished on their return to base-camp did not reach the world until February 1913, three months after a search party discovered his tent covered by snow and containing three frozen bodies, one of them Scott's, in sleeping bags, together with diaries, geological specimens and photographs.

Ross MacPhee's book *Race to the End* was written to accompany a special Antarctic exhibit at the American Museum of Natural History in New York City. Founded in 1869 the museum is today one of the largest institutions of its kind with a broad scientific, educational and cultural mission carried out by more than 200 scientists who conduct research and manage a vast array of collections of specimens and artefacts. The author is Curator in the Division of Vertebrate zoology and was also the curator of the exhibit. He has been in Antarctica many times and is intimately acquainted with the history of many facets of its exploration and science. Through close institutional cooperation with the Scott Polar Research Institute (SPRI) in Cambridge, UK, and both the Fram Museum and the Norwegian National Library in Oslo he was able to assemble many objects and unique images of documents and artefacts as well as photographs associated with the race to the Pole. These are used to illustrate the historical background, context and unfolding of significant events between June 1910 when Amundsen left Oslo on the *Fram* until the fateful discovery of Scott's tent on November 1912 and the impact of this news when it reached world capitals in February the following year.

In chapter one Kathleen Bruce Scott's farewell to her husband in New Zealand on 19 November 1910 as he leaves with the *Terra Nova* for Antarctica starts the story, complemented with a brief historical review of Antarctic exploration prior to the advent of the so-called heroic age to which Amundsen's and Scott's epic battle in a quest to reach the pole belongs. The twelve chapters that follow take us back and forth between the two men's camps and activities during different intervals of time, telling of important turns of events, decisions, difficulties encountered on the way to the pole, and concerns that occupied the minds of the two protagonists.

Each chapter is richly illustrated with images of artefacts, documents, original photographs and material from contemporary media. In the course of this we learn about the foodstuffs, equipment, and preparatory activities that went on at the different base-camps. The scientific components of Scott's expedition are amply covered with brief summaries of essential geological and biological findings. In addition the bearing that differences in approach, influences of national cultures and traditions and the previous polar experience had on the two parallel expeditions are highlighted.

Chapter 12 entitled "It is finished" deals with the two contrasting endings after the pole had been reached, Amundsen's quick return to base-camp and departure for Hobart, and Scott's continual setbacks, loss of two men and final reflections recorded in his diary entries and words meant for posterity written while pinned down for nine days and nights with two remaining companions in his tent in a storm while food and fuel grew less each day.

The two final chapters deal briefly with the aftermath and legacies of the two explorers. The first one ends with Amundsen's disappearance in June 1928 in the Norwegian Sea on a rescue flight out of Tromsø in an endeavour to search for survivors of the crash of the Italian dirigible commanded by his former arch-enemy Umberto Nobile. An Amundsen Foundation was set up to commemorate the Norwegian hero and ended up finally financing publication of some of the scientific results from the man's earlier expedition through the Northwest Passage. The second one recounts the legacy of Scott's *Terra Nova*

expedition and the way it came to symbolize the advancement of science as opposed to Amundsen's quest for laurel gathering. A Scott Memorial Fund raised more than sufficient funds in a trust that was used in 1920, in part, to build the Scott Polar Institute in Cambridge, England.

In an appendix MacPhee's book contains a set of unique panorama fold-outs and a map first issued in a magazine in 1913 to illustrate different stretches in Scott's assault on the Pole and the return leg in which three men finally struggled to their final resting place. Overall the American Museum of Natural History's book is intellectually stimulating and aesthetically pleasing.

Edward Larson's *An Empire of Ice* complements MacPhee's *Race to the Pole* very well. It both broadens the scope regarding the historical background and setting in which the "race" took place and foregrounds the issue of science. Therewith the linking of Amundsen with laurel gathering and Scott with research is accentuated even more.

The first chapter sets the scene. It takes us to the Royal Geographical Society in London towards the end of 1912, when Amundsen recently back from his *Fram* expedition gave a talk on his triumphant South Pole achievement. How Robert Scott had fared was still not known. The British eagerly awaited his return when, it was intimated, the whole country would have a real celebration, one that emphasized the advance of science. The chapter clarifies how the British establishment regarded Amundsen as a lucky interloper who had plucked the prize that was rightfully Britain's. The chapter outlines the broader geopolitical context of "the race" and nicely captures the British mood and what was held to be at stake.

The second chapter charts important episodes in the history of the quest to map the earth's magnetic field, or what was called the "Magnetic Crusade." Here the story goes back to the English seventeenth century astronomer Edmund Halley, traces the upsurge of German terrestrial magnetic research in the early 1800s and the backing James Clark Ross received to find the South Magnetic Pole (Ross had already reached the North Magnetic Pole in 1831). Ross's Antarctic expedition exceeded all expectations. It plotted magnetic lines but did not find the magnetic pole.

On the other hand a whole new world was opened up for exploration and research beyond the great ice barrier and Mt Erebus, Victoria Land was claimed and British priority was established to an important route to the South Pole. The British *Challenger* expedition in the 1870s followed up on Ross's magnetic work and found that the magnetic lines in the Antarctic region had changed dramatically over three decades. Tracking down the South Magnetic Pole became an important argument for launching new expeditions. Larson shows how Scott's *Discovery* expedition and Shackleton's *Nimrod* expedition fit into this history with roots going back to Halley and rivalry with Germany on the magnetic front. He details the vicissitudes and achievements of the two expeditions in this regard, culminating in Shackleton's Northern Sledge Party coming close to the Magnetic Pole which for scientists was no less interesting than Shackleton's "Furthest South" (i.e., coming close to the Geographic Pole). Of course it was not insignificant that the Union Jack was also ceremonially planted near the Magnetic South Pole.

The third chapter concentrates on map-making and topography. It distils the contributions of the *Discovery* and *Nimrod* expeditions in this particular

branch of geographic research, again linking it to a long tradition in British imperial history that includes the names of Livingstone and others who sought the sources of the Nile and Franklin, as well as Nares plus others who explored the Arctic north. Chapter four does something similar for oceanography and marine biological work in McMurdo Sound and the charting of meteorological features along the Ross Ice Shelf (as it is called today) and the region around Mt Erebus.

In chapter four the author shifts gear in order to delineate the ideology that inscribed polar exploration into the heroic imagery of Britain's survival in a Darwinian world of struggle and rival powers where slackers were associated with decline. Polar exploration counted as a means to train and discipline naval officers and men during peacetime. It was believed to stimulate courage, daring, boldness and chivalry. The survival of the British Empire, it was held, hinged on these qualities. The champion of eugenics, Francis Galton, Larson argues, saw here the antidote to lethargy that he feared would otherwise lead to the demise of the British race. He had seen signs of it in the Boer War. Larson further notes how these ideas were promoted among geographers and explorers and that Clements Robert Markham carried some of them into his promotion of Antarctic exploration. Additionally the chapter traces how this ideology was present in Scott and Shackleton's determination out on the ice. Scott, groomed and backed by Markham, represented the ideals of British manhood in the Edwardian age—"grit" and self-sacrifice in the service of science and honouring the nation. Media commentators portrayed overcoming adversity to do good science as a sign of moral and national fitness.

According to Scott, Shackleton failed to measure up to these standards during the *Discovery* expedition and was duly sent home after only one year. Shackleton's humiliation knew no bounds and became the source of his determination to demonstrate otherwise, taking revenge on Scott by outdoing him in the field. This was an important driving force in Shackleton's own *Nimrod* expedition. Larson shows how willpower in this case translated into important geological work and meteorology. Shackleton's success in turn upset Scott who now declared he would have a second go and plant the Union Jack at the South Pole. Science and politics intertwined. Reliance on man hauling was a common denominator wholly in line with British naval tradition and the enactment of a culture that hyped racial fitness and moral character. The use of dogs to replace manpower, it seems, would have essentially diluted this doctrine.

In chapter six the author explains how and why biological field work during Scott's and Shackleton's expeditions grew out of a strong emphasis on natural history in nineteenth century British science. Collecting specimens of seals and seabirds and the study of marine microorganisms were an important dimension for the *Discovery* while Shackleton's *Nimrod* expedition focused more on fresh water micro-organisms. The differences, we learn, had to do with the interests of individual investigators. Edward Wilson who participated in both of Scott's expeditions had a pronounced interest in procuring Emperor penguins and their eggs. He thought the Emperor was the oldest surviving species of penguins after a much larger and older species of penguins only known through their fossil remains had disappeared. On the basis of fieldwork he also pieced together a new account of how Emperors breed. This motivated incredible efforts to find and observe baby penguins but also to see what penguins were doing before that stage,

thus calling for a midwinter trek to a rookery in night time darkness to look for eggs in order to complete investigation of the Emperor's life cycle. Scott's second expedition afforded the opportunity, and Wilson grasped it. The epic ordeal of the Winter Journey that brought back three eggs is recorded in his biological assistant Apsley Cherry-Garrard's famous book, *Worst Journey in the World* (1922). The contribution to biology was important. The chapter devotes considerable space to this episode and explains Wilson's work in relation to the scientific debates at the time on possible mechanisms of evolution. Wilson's interest was connected to evolutionary biology and his hope of shedding light on the evolutionary process. The significance of the man's achievement lay there, even if his own theory of avian evolution later proved wrong.

Chapter seven reviews the geological surveys undertaken during the three British expeditions. The author recounts how conflict between the Royal Geographical Society and the Royal Society prior to Scott's first expedition substantially weakened its geological component when Markham's insistence on the supremacy of a naval command structure won out placing science in a subordinate position, precipitating the resignation of the expedition's science director. Despite this the expedition made a relatively good start on which Shackleton's expedition with a strong focus on geology was able to build further. In Scott's second expedition there was a strong contingent of geologists.

Overall the triad of British expeditions covered a lot of territory, investigating several mountainous regions as well as the famed Dry Valley. Using fossil finds and evidence of stratification the scientists pieced together a picture of the Antarctica's past, intimating that it was a continental landmass that was once connected to other southern continents. One of the geologists compared Victoria Land to Queensland, with a fault line running along the east coast separating an uplifted high plateau from what is now a sunken sea basin. All along the chapter lets us follow the various geological parties at different times and in different locations in the field.

Chapter eight deals with glaciology. Here again the resignation of the science director from Scott's first expedition reduced the potential for professional studies in this discipline. It was compensated by many qualitative observations made by Scott and others, suggesting that the polar ice sheet was shrinking. This view was corroborated by further exploration during Shackleton's expedition, but now geologists also studied the movement of the Ross Ice Shelf and two ice tongues extending from Victoria Land into the Ross Sea. During Scott's second expedition the movement of glaciers further inland were studied and different kinds of ice were classified. The reconstruction of what was discovered is interwoven with Larson's depiction of the different adversities encountered in various locations and the misfortunes that in the end overtook Scott's South Pole Party. The author convincingly shows how, taken altogether, a considerable amount of new knowledge regarding various properties of snow and ice and the movement of glaciers was accumulated during the British triad of expeditions.

The final chapter is short, an epilogue simply entitled "Heroes' Requiem." Here the author reflects on the changing meanings projected into the story of the death of Scott and his men. Immediately after the event the value of science was accentuated. Later on as the First World War loomed up it was the moral message of sacrifice to one's nation that stood out. The Second World War rein-

forced the heroic interpretation. In more recent times as entrepreneurial deeds are hyped, the images of Amundsen and Shackleton as strong leaders eclipsed that of Scott, who now became the hapless bungler, a view reinforced with the publication of Roland Huntford's popular book of 1979, *Scott and Amundsen*.

Larson's book was written in reaction to the tendency following Huntford to reduce Scott to an incompetent naval man steeped in Victorian tradition. His own mission is to shift the focus back to the research dimension in the triad of British Antarctic expeditions he expertly unravels in the broader context of both science history and geopolitics. In this he succeeds. His reassessment is timely, coming a few years after the completion of the fourth international polar year that momentarily gained considerable media attention. It also tallies well with the increased significance accorded Antarctic science in an age when attention to global climate change has become an important political issue.

Larson's claim that Antarctic expeditions at the time under consideration in his book were largely a British project is however questionable. It gives a picture of British science as a self-contained system largely isolated from the work of several other explorers and researchers involved in the same range of disciplines and preoccupied with similar research agendas.

One need only think of the expeditions led by Drygalski, Nordenskjöld, Charcot and Filchner during the same period. They also produced equally good science and reflected on similar problems, like the geological history of the Antarctic past and its glaciology, as well as taxonomic issues in biology. Ever since the first international polar year the ideal of scientific internationalism and interaction among researchers of different nationalities existed in parallel with manifestations of great power chauvinism.

The schematic generalization of changing public images of polar heroes with time in resonance with changing conjunctures of ideologies and politics is interesting, but it is also possible to find counter-currents in different constituencies of national populations. As Peder Roberts has shown in a recent paper on how, when Scott and Amundsen for various different reasons have been invoked as exemplars of national polar achievement both past and present by wedding them to particular sets of values, there are several other aspects that also play in. He points to later rivalries between countries and exemplifies with the one over sovereignty claims in Antarctica when a dividing line was drawn between Australian-British and Norwegian spheres of interest (Roberts 2011).

Cornelia Lüdecke's book, *Amundsen*, also starts with the historic race. This time we are taken along to follow the Norwegian on his very final lap to the South Pole. The introductory chapter is entitled "The Day at the South Pole." It provides an extract from the explorer's own travel report and thus presents the situation entirely from his perspective, what he sees, experiences, feels and thinks. His rival Robert Scott is there only in Amundsen's mind as a mirage of eventual uncertainty that is not cleared away until the Norwegian team are well within sight of their goal and know they are first. This opening is very effective, since it immediately introduces us to the complexities of Amundsen's character.

Ten chapters that follow cover successive periods in the explorer's life and achievements while two final chapters focus on his death and continuation thereafter as a legendary figure of the past.

Chapter two covers Amundsen's origins, his youth and early education, and

then in chronological order come the expeditions he was involved in, punctuated here and there with a chapter that takes up significant interludes between them.

The *Belgica* expedition (1897–1899), in which he participated as Third Officer and resented the Belgian commander Gerlache's authority, is referred to as a period of early learning, which in the next chapter is supplemented by an account of his further training, obtaining his captain's papers and mastering instruments to measure earth magnetism.

The general plot is one of following the young Amundsen's learning curve and then the life of the mature professional explorer whose single-minded willpower and focus on prestige transformed him into a controversial figure, a hero revered in some circles and despised in others. The plot is straightforward, each expedition is detailed and its most significant events are pieced together with exceptional care and clarity. Attention to scientific aspects and the complexities of obtaining empirical data under extreme conditions combines with accounts of dramatic episodes that serve to enliven the storylines.

The *Gjøa* expedition through the Northwest Passage is portrayed as still belonging to Amundsen's apprenticeship period. It qualified him as a polar explorer to be reckoned with, but we also see how during the course of it his interest in the scientific aspects of the magnetic Pole were eclipsed by a fascination with the survival techniques of the northern Canadian Inuit and learning from them. In the long run the ethnological results of the *Gjøa* expedition also turned out to be much more important than the magnetic ones. The race to the South Pole is depicted as Amundsen's masterpiece: we are given a very good overview of the various stages in this expedition, its background, and significance for the explorer's later life. Thereafter follows an interlude of financial difficulties and interactions with Norwegian but also German scientific communities, as the promise to carry out a replay of Fridtjof Nansen's Arctic drift experiment is now finally acted upon.

The chapter on the crossing of the Northwest Passage and the first leg of the *Maud* expedition (1918–1921) is entitled "The Injured," referring to the injuries Amundsen received in an attack by a polar bear and a nasty fall, which placed him in a kind of subdued background position while Harald Ulrik Sverdrup successfully upheld the banner of science. Again we are provided with a good overview of important facets of the expedition.

In the next chapter we follow the *Maud* expedition's subsequent phases (1922–1925) when Sverdrup, despite all odds, reaped further scientific successes, while Amundsen himself became more interested in a quicker way to reach the North Pole. The experimentation with airplanes is superbly reconstructed by Lüdecke and she neatly places these efforts in their contemporary both scientific and technological contexts. Thereupon, of course, comes a chapter on the first dramatic flight that almost reached the pole. Here again we are alerted to the role of various stakeholder interests involved (and various levels of rivalries) at the time. Amundsen's initiative in facilitating the design and German manufacture of a useful solar compass is discussed, a highlight that is often ignored in earlier accounts of the man's achievements, since they have one-sidedly fixed on his reputation as an adventurer. We learn how a later version of this compass was still used by the two Dornier-Wal planes *Boreas* and *Passat* engaged in photogrammetric survey flights over Antarctica during the German *Schwabenland* expedition 1938/1939.

Here Cornelia Lüdecke's earlier research on and intimate knowledge of the history of the role of polar flights in the context of exploration and research is an important asset. She is able to provide insights into the pioneering role Amundsen played in this regard, therewith counteracting the less serious and dismissive approach one can find in some of the literature that nowadays seeks to play up the science dimension in Scott's expeditions by playing it off against a lack of the same in Amundsen's exploits.

The stories, respectively, of the Dornier-Wal flying boats in an almost successful attempt to reach the pole, and thereafter the successful flight over it with the dirigible *Norge* are both told in rich detail. The author clarifies the intricacies of logistics, competing actor networks, money and power plays, as well as complicated personal relationships, but without losing sight of the overall historical significance of the pioneering experiments. Thus we are able to better appreciate dimensions that otherwise get lost when the focus of a narrative is on record-breaking while obscuring the pioneering nature of technological experimentation.

The final two chapters are short. They follow Amundsen during his few final years, his bitterness and lonely self-isolation and his disappearance and its aftermath.

The disappearance 18 June 1928 is shrouded in mystery. Most likely the crash occurred somewhere in the Norwegian Sea below or above Bear Island.

Thereafter, on 24 October, Nansen held a powerful memorial speech that was broadcast by radio into many homes throughout Norway. About two months later at 12 o'clock the country came to a halt—two minutes of silence during a day of national mourning and remembrance, on 14 December 1928, an important date in the history of the Norwegian nation. Amundsen the polar hero was immortalized as an icon. His departure at the same time marked the end of an era.

Cornelia Lüdecke is to be commended for her successful attempt to come to grips with her elusive subject. Throughout the narrative flows easily, rich in detail, also when it comes to reflecting telling elements in the man's complex personality, his enigmatic relationship with women, and the circumstances that led to his final psychological and physical tragedy, only to rise from the ashes as a legendary figure whose end also symbolized the definite end of the heroic age of research and exploration to which he belonged.

This biography, published in pocket book form, is a handy reference work for anyone who wants to quickly find out what the man was doing at different points in his life. The bibliography is also useful, although the Scandinavian reader will miss some of the newer literature Norwegian scholars have produced in their native language in recent years.

The book should definitely appeal also to a wider audience interested in gaining a more balanced view of Amundsen than the one in the Anglophone literature that mainly constructs him as the figure who beat Scott to a mathematical point at the extreme "bottom" of our globe.

Amundsen and Scott have been remembered many times and in different ways during the past century. On each occasion new facts and perspectives have come to light, and equally interesting—in retrospect—is how the constructions of memory are historically contingent, they change with the times.

REFERENCES

Cherry-Garrard, A. (1922). *Worst Journey in the World. Antarctic, 1911–1913*, 2 vols., London: Constable & Co. (New edition 1965, London: Chatto & Windus.)

Huntford, R. (1979). *Scott and Amundsen*, London: Holder & Stoughton.

Roberts, P. (2011), "Heroes for the past and present. A century of remembering Amundsen and Scott," *Endeavour*, 35:4, pp. 142–150.

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Johan Schimanski, Cathrine Theodorsen & Henning Howlid Wærp (eds.), *Reiser og ekspedisjoner i det litterære Arktis*, Trondheim: Tapir Akademisk Forlag 2011, ISBN 9788251927819, 386 pp.

Reiser og ekspedisjoner i det litterære Arktis ['Journeys and expeditions in the literary Arctic'] is an outcome of the project Arctic Discourses, initiated by a group of researchers at the University of Tromsø. Most of the contributions of the anthology are in Norwegian, one is in Danish and one in Swedish. The aim of the articles is to examine representations of the Arctic in various genres from the Romantic period to the present. The book is divided into three parts. The first focuses on how the Arctic has been represented in literature of explorations from the nineteenth century. The second investigates travel writing, mostly from the first part of the twentieth century. In this part there is a shift from encounters with the Arctic nature and climate to cultural and humane encounters. The third part, finally, concentrates on representations of the Arctic in imaginative writing, satire, fiction and film.

In the introduction the editors highlight the contradictory, dichotomous images of the Arctic that have circulated in Europe through the ages. It has been associated both with light and with darkness, with peace and quiet, on the one hand, and the uncanny and monstrous, on the other, and so forth. Conflicting characteristics have also been projected on to the people of the Arctic, who have been seen both as uncivilised, and as strong, healthy and happy. The establishment, mediation and transformation of these ideas of the Arctic, its nature and peoples, is the main theme examined by the various contributions. To a large extent this involves a focus on ideas entertained and expressed by visitors and "outsiders," but there is also some focus on representations produced by local people, such as the indigenous Inuit and Sami people.

One recurring topic in this kind of anthology is the issue of what the Arctic comprises. This theme is discussed with examples that show how definitions have shifted. A strong trend has been that the Arctic has been defined from the south. The editors point out that there are contradictory definitions that are being used in present day Norway, which give different answers to the question whether the northernmost parts of Norway should be included. They also emphasize that the Arctic is a set of mental mappings. This idea, elaborated by the geographer J. Wreford Watson, underpins the Arctic Discourses project.

The first article of part I is Nils M. Knutsen's contribution about the French *La Recherche expedition* 1838–1840 to the northern parts of Norway. The expedition included participants from Denmark, Norway and Sweden, among them the artist Auguste Mayer, whose drawings provide a unique documentation of local architecture, sceneries and people. Knutsen is preoccupied with the question of why such a large-scale expedition has fallen into oblivion among the Norwegian public of today. He points out that although the final outcomes were less than planned from the beginning, the expedition still resulted in the publication of the most comprehensive work about the Nordic countries and Norway that has ever been published. The answers he suggests

are that lack of drama in the form of tragedies and heroic exploits, together with the absence of geographical discoveries, as well the existence of a centralistic tendency within Norway that has marginalised the northern parts of the country, explain why the expedition has disappeared from the Norwegian public memory. These factors may very well contribute to the oblivion of the expedition, together with the fact that the popular accounts of the expedition were published in French. Another thread worth exploring is the interconnection between scientific pursuits and nationalism, and the role this plays for the creation of national(ist) narratives of greatness and progress. As the *La Recherche expedition* was a French initiative, funded and managed by the French, this kind of expedition has not provided subject matter for boosting Norwegian national consciousness, which perhaps may explain why it is little known today.

Johan Schimanski and Ulrike Spring focus on the imprints of the Austro-Hungarian expedition to the North Pole of 1872–1874 on literary representations from various genres. The expedition itself was quite dramatic as the ship got stuck in the ice for a period of two years. The article discusses the use of fictionalising devices and writing techniques in literary representations and how these are related to the real events of the expedition.

With Otto Sverdrup's *Nyt land. Fire Aar i Arktiske Egne* ['New land. Four years in the Arctic'] (1903) as an object of analysis, Henning Howlid Wærp attempts to answer the question why Sverdrup's account of Arctic explorations has not had the same success as the books by Nansen and other explorers. He concludes that the reason for this is that Sverdrup lacks skills as a narrator. According to Wærp Sverdrup's book is tedious and repetitive, focused on details about trivial matters, and lacking in dramatic detail and form. Wærp discerns five ingredients necessary for making an account of explorations interesting to readers: 1) conflicts and tensions between the characters involved; 2) dramatic episodes; 3) descriptions of natural scenery; 4) encounters with alien cultures; and 5) the mapping of new land. Wærp emphasizes that these ingredients were not lacking in the expeditions themselves, but that Sverdrup for various reasons chose not to, or failed to, utilize them in order to spice up his account. It is furthermore suggested that the style of the account is a factor that may attract, or dissuade, readers. Nansen's emotional style with ample metaphors is contrasted to Sverdrup's more matter of fact style. In order to account for the specific generic character of reports published as books by explorers, Wærp refers to theories of documentarism in film (Nichols 2001; MacCann 1973). He highlights the important notion that a documentary is the result of a creative treatment of subject matter and that what matters is not that the material is authentic, but that the result is (experienced as) authentic.

In the following article Silje Solheim Karlsen discusses nuances and shifts in representations of Nansen by comparing his self-characterization with the Nansen portraits made by his co-travellers when he left the ship *Fram*, Hjalmar Johansen and Otto Sverdrup, who was in charge aboard after Nansen had left. Karlsen finds that there is a discrepancy between the representations in Johansen's and Sverdrup's books and those of their unpublished diaries, pointing out that the portraits of Nansen in the diaries are far more critical than in the published books. Both Johansen and Sverdrup are characterised as distanced, but loyal in their public view of Nansen. One of the men aboard, Bernhard

Nordahl, also wrote a book, *Framgutterne* (1898) ['The Men of *Fram*'], which differs from the books of Johansen and Sverdrup by being more critical as well as distanced to Nansen. Karlsen discusses the reasons for these differences, emphasizing that Nansen was considered a national hero by the Norwegian public and that there was a convention for how the exploits of the hero should be narrated. Karlsen also elaborates on Nansen's skill in creating and presenting himself as a Norwegian national hero, an embodiment and continuation of a mythical Viking spirit. As Jørgen Alnæs has proposed, Nansen succeeded in creating a form of self-representation which became the norm for how exploration narratives were to be constructed in Norway (Alnæs 2008). Karlsen points to some interesting differences between this norm and the representations of Johansen and Sverdrup, which she finds are less self-centred and more centred around a collective.

Finally Karlsen discusses how the *Fram* expedition has been used as subject matter in fiction, cartoon and drama from the 1920s until the present. Of course a writer of fiction has greater freedom to use subject matter than a writer who claims that he or she is "telling a true story." One aspect of this is that present-day writers display an urge to question and challenge notions of heroism, masculinity and authority embedded in the traditional narratives of heroic exploits. Karlsen particularly discusses fictional representations of a homoerotic relationship between Nansen and Johansen, and proposes that these may represent reactions to homages to male explorers like Nansen.

In the first article of the second part Marie-Theres Federhofer presents contradictory ideas of the North among the early German Romantics. The main theme, however, is an analysis of the German writer and scientist Adelbert von Chamisso's (1781–1838) representations of the Arctic in various genres. She concludes that while the Polar North of his fictive texts *The Fable of Adelbert* and *Peter Schlemihl* is represented as a gloomy, cold and hostile place for humans, the representations of his scientific works are more nuanced and in many respects modern in the sense that Chamisso displays an awareness of his own position as a European 'outsider' when describing alien places, customs and peoples. According to Federhofer Chamisso contributed to a differentiation between artistic, literary representations of the Arctic, on the one hand, and a scientific discourse on the other.

The next essay, by Olga Komarova, is a recount of the Russian Nemirovich-Danchenko's travel account of a journey from Archangelsk to Vadsø in 1873. Komarova highlights Danchenko's interest in the industrial development and modernisation of the North and his encounters with colonisers of various nationalities. In the travel account these encounters illustrate the author's sympathy for ordinary, hard-working people, and his keen eye for problems caused by, for example, alcoholism. The prime object of analysis is the traveller Danchenko himself, as he comes to life in his own narrative of the journey.

In the following essay Fredrik Brøgger analyses Knud Rasmussen's account of the fifth Thule expedition published in two volumes in Danish under the title *Fra Grønland til Stillehavet. Reijser og Mennesker fra 5. Thule-Ekspedition 1921–1924* in 1925 and 1926. In 1927 an abbreviated translation, *Across Arctic America. Narrative of the Fifth Thule Expedition*, was published. Through close reading of passages Brøgger analyses Rasmussen's ambivalent view of the merits

of modern civilisation versus Inuit culture, and vice versa. Brøgger points out that Rasmussen differs from other successful explorers of the Arctic through his background. He had an Inuit mother and a Danish father and he grew up in Greenland. He knew Inuit languages and was familiar with Inuit culture. Thus he does not come as a complete outsider and stranger to the Inuit communities he visits. Brøgger exemplifies with a passage to show that Rasmussen, at least occasionally, experienced himself as part of an Inuit collective. However, he also saw himself as a modern scientist and explorer. Far from interpreting this condition as a tragic split in Rasmussen's personality, Brøgger sees it as an instance of a positive plural identity, which enables Rasmussen to view things from multiple positions simultaneously. According to Brøgger Rasmussen experiences take place in a borderland where relations between the Inuit and "modern" Western man, and various ways of living and perceiving, are being negotiated. He suggests that Rasmussen's consciousness may be seen as a kind of *mestiza* consciousness, as described by Gloria Anzaldúa in *Borderlands*, that is as the consciousness of a person who "has a plural personality," a person who "operates in a pluralistic mode" (Anzaldúa quoted in Brøgger, p. 193).

The Canadian-American anthropologist and Arctic explorer Vilhjalmur Stefansson's representations of Inuit people and culture is the topic examined by Silje Gaupseth, by means of a close reading of Stefansson's travel account *The Friendly Arctic. The Story of Five Years in Polar Regions* (1921). The book is based on Stefansson's last expedition, which took place between 1913 and 1918. Gaupseth's main point is that Stefansson's view of Inuit people and culture is profoundly ambivalent. With Fabian's *Time and the Other. How Anthropolo-gy Makes its Object* ([1983] 2002) as a theoretical framework, she argues that the Inuit are constructed as childish, naïve and primitive. By means of references to childlike qualities Stefansson represents the Inuit as distanced from the modern world and as different from modern man, that is as a people of the past that has not been able to adapt to the modern world and rational, "scientific" modes of perceiving the world. Gaupseth's conclusion is that although Stefansson sees the Inuit as experts on how to survive in the Arctic when it comes to hunting methods, travelling and the building of snow houses, he represents himself as the one fittest for survival, as he can learn the skills of the Inuit and use these rationally. To exemplify Gaupseth analyses Stefansson's account of how he learnt to build a snow house by using traditional Inuit building techniques and how he improved the house by modifying the entrance, which stopped cold air from entering. Another example is Stefansson's account of how he learnt hunting seals and how he made the hunting more "efficient" by skipping traditional Inuit practices, which he saw as superstitious and superfluous. Gaupseth places *The Friendly Arctic* in a colonial context, pointing out that Stefansson's purpose of constructing the Arctic as a "friendly" place where modern men can not only survive, but also live well, is to present the Arctic as a place suitable for future colonisation.

In a quite different vein Liv Lundberg's autobiographical essay with specimens of her own poetry initiates the third part of the anthology. Unlike the other contributions Lundberg's essay does not include any list of references, it ends with a bibliography of Lundberg's own literary production. In the anthology as a whole Lundberg's text represents an alternative, creative mode of writing about the Arctic.

Heidi Hansson's contribution focuses on alternative Arctic discourses, which question the dominant nationalistic and imperialist narratives of successful male explorers, by using specimens from the British magazine *Punch*, music hall entertainment and A. A. Milne's story about *Winnie-the-Pooh* "In Which Christopher Robin Leads an Expotition [sic] to the North Pole." Her conclusion is that there indeed was an alternative Arctic discourse during the early part of the twentieth century and that this coincided with social changes which modified the role narratives of conquest and national self-valorisation play for shaping ideas of the nation.

By means of an analysis of the Danish author Kim Leine's novel *Kalak* (2007), Greenlandic for "real" or "authentic" Greenlander, Kirsten Thisted highlights the emergence of a new kind of representation of the relationship between Danes and Greenlanders. The protagonist of Leine's novel is a man who becomes a sexoholic and drug addict while working as a nurse in Greenland. As Thisted points out, Leine's portrait of the dysfunctional young man is quite the opposite of the traditional hero, helper and explorer, "the good and humane coloniser" who according to a prevailing Danish self-image is not in Greenland in order to exploit and make profit, but to help and civilise. Thisted concludes that traditional accounts of the white man's burden are being increasingly problematized, both by Danish authors writing about Greenland and by Greenlanders themselves.

Cathrine Theodorsen discusses the Austrian writer Christoph Ransmayr's novel *Schrecken des Eises under der Finsternis* (1984) as a deconstruction of official expedition narratives that valorise explorers and the project of travelling into the unknown Arctic. The journey of the protagonist Mazzini is characterised as a *second journey*, that is a journey that "uses a previous travel narrative as a 'map' to follow" (Maria Lindgren [2000] quoted by Theodorsen, p. 298). As the fictive character Mazzini follows the trail of the Austro-Hungarian expedition of 1872–1874 his fascination with the sublime Arctic is countered by the novel's depiction of his shortcomings as an Arctic adventurer and the absurdity of his ambition, or longing, to travel into unknown territory which he is totally incapable of mastering. The focus of Theodorsen's reading is that, while the Arctic may be perceived as sublime when experienced from the position of a distant spectator, the real Arctic, that is the Arctic experienced directly by the protagonist Mazzini, is a place where fanatics and unrealistic enthusiasts go under. In Theodorsen's interpretation the shift from physical distance to direct encounters with disastrous effects results in a counter discourse in which the absurd, manifested in a lack of purpose and meaning, replaces ideas of the sublime.

Pavel Lungin's film O*strov*, *The Island*, from 2006 is analysed by Tanya Kudryavtseva, who sees it as a construction of the Arctic as an archaic liminal space, a Russian Orthodox imaginary place where "male holiness" may unfold. At this marginal place religious men are revered by flocks of women who come to the monastery, situated on an island in the White Sea. The main character, a monk who according to Kudryavtseva is a version of the Holy Fool, is sought after by women pilgrims in need of guidance. The action of the film takes place in the 1970s. Kudryavtseva concludes that the film effaces not only the Orthodox Church's compliance with the Soviet regime, but also the Sami cultural

heritage of the Arctic. The film is seen by her as a marginalisation of women, a theme explored in a discussion of the Holy Fool monk's exorcism performed on a young woman who is taken to the island by her father. The woman lunatic is cured by the Holy Fool, which Kudryavtseva interprets as a plotting that transforms the subversiveness of the male marginal character (the Holy Fool monk), as another female subversive, marginal character (the mad young woman) is healed by him.

Lill Tove Fredriksen examines the Sami writer Jovnna-Ánde Vest's trilogy *Árbbolaccat* ['The heirs'] published between 1997 and 2005. The theme, time, setting and characters of the novel are discussed and connected to Sami history, mentality, views of knowledge and ways of life. The protagonist of the trilogy is a man who is the first person ever to have moved away from his native community of Máhtebáiki in Northern Finland and then moved back again. Heaika, the protagonist, is also the first writer of the Sami community of Máhtebáiki and his life project is to write the history of the place, recording traditional ways of life. The time of the novel, the years from the 1950s to the 1980s, is one of transition from oral transmission to the modern age of writing, and it is the protagonist who returns who takes it upon himself to record, document and thus to preserve the local history and traditions of the society of Máhtebáiki which is about to change.

The last article discusses various versions of Robert J. Flaherty's film *Nanook of the North* (1922), "the ancestor of the documentary film." Roswitha Skare focuses on differences in introductory texts and titles. The film about the Inuit hunter Nanook and his family was praised for its "authenticity." It was also criticised by people familiar with Inuit culture. The polar explorer Vilhjalmur Stefansson, for example, who lived for several years among the Inuit, claimed that the story of Nanook was "as true as that of Santa Claus." Nevertheless the film has become a classic, restored and made available as a dvd.

Reiser og ekspedisjoner i det litterære Arktis includes studies of the ways in which the nature and people of the Arctic have been experienced and mediated in literature, popular culture and film. The analyses cover material from the time of the first visitors/explorers to the present. While travel writing and exploration accounts are typical genres for the early visitors, there is a shift to the narratives of local and indigenous people in the stories of the last decades. The anthology contributes to a discussion of the transformation of discursive constructions of the Arctic from the late nineteenth century to the present. As a whole the collection is engaging, multi-faceted and accessible.

REFERENCES

Alnæs, J. (2008). *I eventyret. Norske reiseskildringer fra Astrup til Aasheim* ['Experiencing adventure. Norwegian travelogues from Astrup to Aasheim'], Oslo: Cappelen.

Fabian, J. ([1983] 2002). *Time and the Other. How Anthropology Makes its Object*, New York: Columbia University Press.

Lindgren, M. (2000). *The Second Journey. Travelling in Literary Footsteps*, Umeå: Umeå University.
MacCann, R. D. (1973). *The People's Films. A Political History of United States Government Motion Pictures*, New York: Hastings House.
Nichols, B. (2001). *Introduction to Documentary*, Bloomington: Indiana University Press.

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Valery Vasilyev, *Arkhaicheskaya toponimiya novgorodskoy zemli. Drevneslavyanskiye deantroponimniye obrazovaniya*, Veliky Novgorod 2005; ISBN 5987690064, 468 pp.

The current book is an extensive contribution to the onomastic mapping of the Novgorodian land.[1] By this geographical term is meant the territory of the central provinces of the old Novgorodian republic which were situated around lake Ilmen and along the Lovat', Pola, Msta, Shelon', Luga, and Volkhov rivers. Some historians consider it to be the cradle of the old Russian state and democracy.

According to the author's design the current book is dedicated to toponyms derived from personal names (so called Old Slavic deanthroponymic toponyms) and is the first part of a trilogy. On almost 500 pages Valery Vasilyev gives a thorough and systematic analysis of the toponyms dated between the times of the first Slavic settlements in the eighth century and the fall of the Novgorod Republic in the fifteenth century. Through study of the Novgorodian antiquities the author tries to uncover peculiarities of the Old Russian dialects. Some features of the language spoken in medieval Novgorod may be revealed through a large number of ancient toponyms found in the area.

The second volume of the trilogy is planned to describe Slavonic toponyms derived from common nouns, and the third part intends to give analysis of the ancient toponyms of non-Slavic origin, that is, those originated from ancient Finno-Ugric, Baltic and Indo-European roots.

The "Archaic toponymy of the Novgorodian land" consists of seven chapters. Each chapter focuses on specific types of archaic morphemes, characteristic of the analyzed toponyms.

The first chapter gives a detailed picture of the place names based on a so called possessive **-j-*model which was productive in toponyms derived from personal names such as *Lamer'je*, *Unomer'*, *Seslavl'*, *Senezh'je*, *Bokoterzh.* The **-j-*model was used to express possessiveness along with more common morphemes *-ov-/-ev-* and *-in-*. The actual essence of this phonologic phenomenon consists in the change of the consonant at the end of the stem. Quite often it means palatalization. This construction lost its grammatical function in the end of the fourteenth century.

A typical example of a toponym formed according to the **-j-*model is the one based on an anthroponymic composite. For example, the Novgorodian toponym *Dorogobuzh* presumably comes from the old Slavic personal name *Dorogobud*, consisting of two stems: *dorog-* ['dear'] and *-bud* with the imperative meaning of the verb *byt'* ['to be']. The toponym itself could mean 'the settlement of Dorogobud' and has correlations both on the territory of Russia and other Slavic speaking areas: *Drahobuz*, *Drahobudice* in the Czech Republic, *Dargobaz* in Poland, *Dragobuzhde* in Serbia.

The second chapter provides an analysis of geographical names with elements *-goshch/-gost-*: *Mirogoshcha*, *Utorgosh*, *Radgostitsy*, *Milogost'*. Etymologically the component *-gost-* contains the same meaning as the English word *guest.* As many researches point out, a high concentration of such toponyms is very characteristic of the Novgorod region. The component *-gost-* is considered to be one

of the most ancient and frequent stems in the old Slavic anthroponomy, with correlating morphemes in other Indo-European languages. The geographical names with morphemes *-goshch/-gost-* as in the case of the **-j-*model are based on personal composite names. For instance, the toponym *Velegoshchi* is derived from *Velegost* or *Velegost'* (where the last consonant is palatalized). This composite anthroponym consists of two stems: *vele-* ['big, great'] and *-gost* ['guest'].

In the third chapter the author describes toponyms with possessive suffixes *-ov-*, *-ev-*, *-in-*. The geographical names formed by means of these morphemes are considered to be the most frequent in the Novgorodian region, and are still used in forming possessive adjectives and toponyms in Russian and other Slavic languages. In the case of the toponyms, these possessive suffixes are usually followed by an ending of the neuter gender *-o*: *Zubovo* (derived from the noun *zub* ['tooth']), *Lubino* (from the female personal name *Luba)*, *Fralevo* (from the male name *Fral*). The suffixes *-ov-*, *-ev-* were usually used in possessive forms of nouns of the masculine gender, the suffix *-in-* in the majority of cases shows that the toponym was based on a noun of the feminine gender. As one of the examples in the chapter shows, the toponym *Nekshino* is derived from *Neksha*—the short variant of the old Slavic composite name *Negomir.* This name consists of two stems: *nega* ['bliss, delight'] and *mir* ['peace'].

In the forth and fifth chapters attention is paid to the archaic toponyms ending with *-ichi/-itsi* (*Borovichi*, *Lyachovichi*). The use of the suffix *-itsi* instead of the more usual *-ichi* reflects the peculiarities of the ancient Novgorodian dialect, with its tendency to have a *ts*-sound instead of a more usual East Slavic *-ch*. Correlations to this specific pronunciation can be found in West Slavic languages, where the suffixes *-ici*, *-icy*, *-ice* are used. Many of these geographical names are patronymic by nature, that is, in those areas Slavic tribes lived who inherited their names from the ancient ancestor. Thus the toponym *Lyachovichi* originally had the meaning of 'people of Lyach' or 'descendants of Lyach.' Presumably such toponyms were especially productive during the fifth and sixth centuries AD. That patronymic meaning however faded away during the later ages so that the suffixes *-ichi/-itsi* would also be used to express a more general possessiveness, namely relation to the owner of the settlement. For example, the toponym *Florevichi* could mean 'Flor's village, estate.'

However in the later centuries the toponyms based on *-ichi/-itsi* could also identify the people living in a specific place: *pskovichi* ['people living in Pskov'], *moskvichi* ['people living in Moscow']. The latter use is thoroughly analyzed in chapter 5. One of the toponyms analyzed is *Borovichi*, the second largest city in the Novgorod region. Apparently this geographical name is derived from the noun *bor* ['forest'] and *borovichi* could mean 'forest people' or 'people living in the forest.' Similar geographical names are found in Poland. The word *borovicy* is applied to the population of the city of Borowna. In the modern Polish language we can find country names which also mean their inhabitants: *Nemcy* (both Germany and Germans), *Włochy* (both Italy and Italians).

Chapter 6 deals with Novgorodian toponyms which originated from the Old Slavic personal names, such as *Sopsha*, *Luboneg*, *Kochebud*, *Vycherema*, etcetera. Those geographical names are rather few in number and appear mainly as hydronyms, or even microhydronyms—names of small rivers, streams, ponds, water springs etcetera. Some of them got names which had to be associated with

certain traits of character. Thus the weed-covered bed of the Porus'ya River near the city of Staraya Russa is called *Malashka*, which is the diminutive variant of *Malan'ya*. According to the Russian folklore this name was often used about a foolish and untidy woman, and apparently that name fitted perfectly for the useless and untidy river-bed.

Another interesting example is *Vycherema* village which is situated on the right bank of the Msta River. The contemporary variant is the result of phonetic and grammatical changes of the initial *Nizhni Vychemer* ['Lower Vychemer']. The latter was first mentioned in the census records in 1564. The adjective *nizhniy* ['lower'] as a common component of Russian toponyms is used to point to another settlement with the same name situated up the river (e.g. Nizhniy Tagil, Nizhniy Novgorod). It is very likely that *Nizhni Vychemer* lost the first indicating adjective when the other *Vychemer* ceased to exist. Besides, the consonants *r* and *m* were exchanged due to the metathesis and the *-a*-ending was obtained as the result of the gender change. *Vychemer* has correlating toponyms in two other Slavic speaking countries—*Weczmer* in Poland and *Vichmero* in Ukraine. Most likely this geographical name is derived from the old Russian *Vyachemer* consisting of two stems: *Vyache* (< old Slavic **vętje* ['more']) and *mer* (< *mir* ['peace,' 'tranquility']). Similar anthroponyms can be found in other Slavic languages: *Viecemir* (old Czech), *Więcemir* (Polish), *Vecemir*, *Więcemiar* (Serb.-Croatian).

Chapter 7 describes street names in medieval Novgorod taken from the chronicles and charters of the eleventh till the fifteenth centuries. It is important to mention that the streets in contemporary Novgorod got their historical names returned in 1991. However, there are still ongoing debates about the relevance of the old street names as many of them sound quite archaic. The majority of these toponyms originate from old Slavic composite names, like *Dan'slavlya* street, derived from *Dan'slavl'*. Some streets have names of Christian origin, as the boyars in medieval Novgorod often built churches named after their heavenly protectors: *Fyodorova* (from Fyodor), *Mikhailova* (from Mihkail), *Pavlova* (from Pavel).

Rozvazha street is often mentioned in the chronicles of the fourteenth and fifteenth centuries, and is an interesting example of the deanthroponymic toponymy. In spite of the word's similarity to the modern verb *razvozit'* ['to transport'], it has nothing to do with transportations of goods. Most likely the street was named after its first inhabitant with an old Slavic name *Rozvad*, and *Rozvazha* is the possessive form of this anthroponym formed according to the **-j*-model. Similar personal names can be found in other Slavic languages: *Rozvad* (Czech), *Rozwad* (Polish). According to the author this personal name is derived from the verb **rozvaditi* ['to spoil,' 'instill bad habits']. I am inclined to think that *Rozvad* could also mean 'amusing' or 'funny' as there is a related Ukrainian verb *rozvazhiti* ['entertain'].

Boyana is the earliest recorded street in the Novgorodian chronicle. Some researchers think that this toponym has to do with *buyan*—the dialectal Russian word for 'landing place, pier.' Another possible etymology is the dialectal Novgorodian word *buy* ['height, hill']. Valery Vasilyev supposes that the street's name is deanthroponymic. The personal name *Boyan* and its variants were fairly common in all Slavic speaking areas. One of the possible meanings of this anthroponym is "the one everybody is afraid of," which originates from the verb *boyat'sya* ['to be afraid'].

Summing up I would highly recommend this book to those interested in the history of Slavic languages and especially researchers of Slavic and Indo-European toponyms. As Valery Vasilyev shows, the Novgorodian toponyms derived from old Slavic names are numerous and have many correlations in other Slavic speaking areas. The majority of the analyzed toponyms express possessiveness, indicating the name of the founder or the first inhabitant of the settlement. The same principle can be applied to hydronyms and ancient street names. Through study of the ancient toponyms *Arkhaicheskaya toponimiya novgorodskoy zemli. Drevneslavyanskiye deantroponimniye obrazovaniya* ['The archaic toponymy of the Novgorodian land. Old Slavic deanthroponymic formations'] offers the reader a fascinating journey into the world of the lost language of the first Russian democracy. That dialect later merged into the Moscow dialect, thus forming the ground for the modern Russian language. According to Andrey Zaliznyak the cluster of Novgorodian dialects could have become a separate East Slavic language, had it not been for the Moscow invasion in the fifth century.

NOTES

[1] This publication has been produced during my research work at Umeå University, thanks to a Swedish Institute scholarship.

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Marit Åhlén, *Runstenar i Uppsala län berättar*, Uppsala: Upplandsmuseet 2010, ISBN 9789186145125, 121 pp.

The runic inscriptions of Uppland are described in the work *Sveriges runinskrifter* ['Sweden's runic inscriptions'], vols. 6–9, where they were examined and interpreted by Elias Wessén and Sven B. F. Jansson (1940–1958). Marit Åhlén's monograph gives the reader an easily comprehensible and updated description of the numerous rune-stones in Uppland. In an introductory chapter the origin of the runes is described, elements in the language of runic Swedish are accounted for, and a basic insight into the art of reading rune-stones is given. The reader is also given a picture of the geographic distribution of the rune-stones in the province of Uppland: in 90 per cent of the parishes of the province there is at any rate some Viking Age runic inscription, but the largest proportion is naturally found in the districts closest to the Lake Mälaren. In one chapter the memorial monuments are described. A special section is devoted to runic inscriptions in memory of women. Åhlén emphasises that it is possible to gain a great deal of knowledge of the cultural landscape of the eleventh century by means of the rune-stones, since they were placed to such a great extent at the communication routes, on borders of different kinds etcetera. Some toponyms are also found in the inscriptions. In addition the contemporary history is discernible. One can for example read about people who had made far-reaching journeys, as on the Sjusta stone, which says that Spjallbude had died in Olav's church in Holmgård (that is Novgorod), or on the stone that is built into the outside of the apse wall in the church in Gamla Uppsala, where it says that it was raised by Sigvid Englandsfararen. One can also read about rune-stones that were moved abroad and sometimes remained there and sometimes were brought back. In this connection it may be pointed out that the moved rune-stones are dealt with in a special chapter in the book. Some renowned rune masters are mentioned, such as Balle, Fot, Åsmund and Öpir–Åhlén herself dealt with the last-mentioned in her doctoral thesis in 1997—, and a whole chapter is devoted to the rune-stone ornamentation. Some linguistic aspects are dealt with in a chapter about the personal names and by-names that are found in the inscriptions. Important questions such as that concerning the ability to read in Uppland in the Viking Age are touched on more briefly. In the richly illustrated book the author manages in an excellent manner to summarise the research, also for a broader audience.

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M. H. Brummer, *Försök Til et Swenskt Skogs- och Jagt-Lexicon* (Skogs- och lantbrukshistoriska meddelanden 49. Supplement till Kungl. Skogs- och Lantbruksakademiens Tidskrift), Stockholm: Kungl. Skogs- och lantbruksakademien 2010, ISBN 9789185205950; ISSN 14020386, 159 pp.

Magnus Hendric Brummer's *Försök Til et Swenskt Skogs- och Jagt-Lexicon* ['Attempt at a Swedish Forest and Hunting Encyclopaedia'] was published for the first time in 1789 and has now been published in a beautiful new edition, where the text of the original has been transferred from the frakture by Rut Kåhrström. When reading the text the reader is struck by how modern the author is in many respects:

there is for example here a notion that human beings' use of resources must be balanced in order for forests with their richly composed flora and fauna to be able to survive. An illustrative example is what can be read under the headword *Åwerkan* ['Damage']—in which there is a long list of contemporary damage of forests—and *Wård*, *skogens wård* ['Conservation, forest conservation']. Brummer is also a practically experienced writer, since he was active as a forest superintendent in Halland. Kerstin Ekman's introductory essay "Ensam, fattig och flitig" ['Lonely, poor and industrious'] provides a personally coloured picture of Brummer. Roger Bergström and Kjell Danell describe the organisation, contents and sources of inspiration of the encyclopaedia. The encyclopaedia itself consists of 122 headwords, 39 of which are about animals and 13 about species of trees. Naturally, more concepts are dealt with in the individual, often quite comprehensive articles, for example under the headword *Fogel* ['Bird']. Among many individual items one can note that *ljungpipare* ['golden plover, *Pluvialis apricaria*'] is presented under the headword *Ljungspole* and *järv* ['wolverine, G*ulo gulo*'] under *Vielfras*. The verbs included in Brummer's encyclopaedia are probably the most interesting items: among other things *afdrifwa*, *anskjuta* and *hwalwa* are found. As mentioned, this encyclopaedia gives us insights into a period that is certainly two centuries back in time but still felt to be so close to us.

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Henrik Galberg Jacobsen, *Ret og Skrift. Officiel dansk retskrivning 1739–2005*, 1. Direktiver. Aktører. Normer; 2. Ordlister. Kronologi. Bibliografi (Dansk Sprognævns skrifter 42), Odense: Syddansk Universitetsforlag 2010, ISBN 9788776744748; ISSN 04150155, 1202 pp.

In May 2010 this impressive two-volume work was presented as a doctoral thesis at Syddansk Universitet in Odense. *Ret og Skrift* constitutes a detailed description of the official Danish orthography and its history, but it also wants to contribute to "an understanding of the societal, political and linguistic factors that have resulted in the official Danish spelling" (p. 25). What is focused on is the spelling prescribed by public authorities, even if sometimes such private spelling norms are also glimpsed as achieved official recognition later on. Previous research on orthography is found in various accounts of language history but also for example in some works touching on the area of literacy. In addition there are earlier spelling dictionaries and works dealing with individual problems, such as the use of small and large initial letters, *aa/å* and other matters. The first part of the work deals with directives, actors and norms. There is a detailed description of norm establishing directives presented during the period and the directives' relations to one another. The orthographic frameworks are established through these frameworks and the actors appear very clearly. Galberg Jacobsen starts with Christian VI's grammar school decree in 1739, and describes Rasmus Rask's and N. M. Petersen's respective orthographies. He emphasises the so-called Nordic orthographical meeting in Stockholm in 1869, where a group of people met to bring the written Danish and Swedish closer to each other. The author also elucidates the work with *Dansk Retskrivningsordbog* (DRO 1923–46),

Retskrivningsordbog (RO1, 1955) and *Retskrivningsordbogen* (RO2, 1986 ff.)—the orthography evidently aroused strong feelings and several tumultuous meetings are described here. The dominant orthographic event is the reform of 1948, whose background and consequences for official state orthography and for the spelling of placenames are explained. Also the so-called *Majonæsekrigen* ['Mayonnaise war'] in 1985 and the war of commas in the latest decades are dealt with. If what has now been related represents the orthographic status planning, that which might be called the "extrovert orthography planning" (Danish *ekstroverte ortografiplanlægning*), there follows in the description of norms the orthographic corpus planning, or the "introvert orthography planning" (Danish *introverte ortografiplanlægning*). In this chapter there is a detailed survey of about thirty norms that people have related to in different periods, for example small and large letters in appellatives, one or two consonants in *Ytring* and *Yttring* respectively, the use of *c*, *q*, *x* and *z*, *aa* or *å* and the use of commas. Certain principal features of the period in question are described, those concerning the directives are established as well as a "norm profile," and a large number of details are more thoroughly discussed. The second volume starts with a treatment of the lexical elements in the thesis. The author accounts for the spelling of about 1,000 words and word forms found as official norms from the first part of the eighteenth century up to our times. One chapter dedicated to the chronology contains an overview of 1,100 articles with summaries and brief descriptions of orthographic directives of importance for the establishment of the official and private norms. The material is diversified and is the result of an enormous work effort on the part of the author. A special chapter consists of the documentation of literature and archival sources. In a forward-looking postscript the author discusses problems in the current orthography norm, such as the use of commas and optional spellings, and allows himself to outline possible solutions to the problems. A detailed Danish and English summary concludes the work. *Ret og Skrift* describes in the greatest possible detail the history of Danish orthography in the period 1739–2005. Everything is meticulously presented and accounted for from different perspectives: who is the actor, what is regulated etcetera. After reading the work one might feel a need for some kind of summary where the orthography discussion could have been more generally placed in its societal and political context, and comparisons could also have been made with conditions in other languages, for example Swedish. But it is abundantly clear that this is a foundation stone in Nordic language description, and Galberg Jacobsen's two-volume work ought to be able to inspire corresponding descriptions of other languages.

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Elin Gunleifsen, *Attributive uttrykk for prototypisk possessivitet. En komparativ studie av talespråklig variasjon och endring i Kristiansand og Arendal*, Oslo: Novus forlag 2010, ISBN 9788270996223, 307 pp.

In this thesis Elin Gunleifsen deals with prototypical attributive possessive constructions. In Norwegian dialects there are different ways of expressing prototypical attributive possession within a noun phrase with

a noun as head: with the *-s* genitive, *Peters bil* (*Peter's car*), with the double genitive, called *-ses* genitive, *Peterses bil* (**Peter'ses car*), with the possessive marker *sin*, so-called *garpegenitiv* (referring to the expected Low German background), *Peter sin bil* (German *Peter sein Auto*) and with a prepositional phrase, *bilen till Peter* (**the car to Peter*). In possessive noun phrases with a pronoun as possessor we have the following phrases in Norwegian dialects: *hans bil/hanses bil/han sin bil* for *his car*; *hennes bil/hoses bil/hos bil/ho sin bil* for *her car*; *deres bil/dises bil/dis bil/di sin bil* for *their car*. This investigation deals with the variation in marking possession in the dialects in Kristiansand and Arendal in Agder in southern Norway. On an overarching level the author's interest is focused on the spoken language variation and its changes. Naturally, a background of the study is taken from previous investigations of the urban dialects in question by Fridtjof Voss (*Arendals bymål*, 1940) och Arnulf Johnsen (*Kristiansands bymål*, 1942–54). The investigation has a sociolinguistic approach and relates to the increasing interest in urban language. A brief description is therefore given of the research on spoken language in Norway as well as of the research on urban language and language variation and change. Possessive expressions in the third person noun phrases in the Scandinavian languages are geolinguistically and to some extent historically described in Ch. 3. The delimitation of the prototypical possessiveness and the relation between possessiveness and the genitive case is discussed more theoretically. The author also describes her methodological choices, discusses how the material should be valuated, and accounts in a special chapter for how the study is organised in detail. In a lengthy chapter the concrete results are discussed: first the cases where the possessor is a noun, where among other things differences are discussed concerning whether the nouns are common or proper; then the cases where the possessor is a pronoun, where some differences in usage between speakers in Kristiansand and Arendal are in focus; and finally cases with the possessive expression in different syntactic functions, where the chief concern is an analysis of semantic factors. The second result chapter shows that the different language users' choice of possessive forms varies, and that different types of language users may be observed, namely traditional, modern and people who are in a transition phase. The thesis illustrates what a process of linguistic change may be like. It would have been possible to concentrate the account to some extent—the account is for example made at a detailed level both in the text and in the appendices, and some reasoning is very detailed—, and in addition could very well have been raised to an even more generalised level. But it must be underlined that the study provides a clear picture of the processes that occur with "attributive expressions of prototypical possessiveness" in the examined dialects, and for this reason it has a clear value.

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Odd Einar Haugen & Åslaug Ommundsen (eds.), Vår *eldste bok. Skrift, miljø og biletbruk i den norske homilieboka* (Bibliotheca Nordica 3), Oslo: Novus Forlag 2010, ISBN 9788270995899; ISSN 18911315, 315 pp.

The series *Bibliotheca Nordica* has got a flying start. The present volume—

which contains several pages in colour from the medieval manuscripts—deals with the Old Norwegian Homily Book on the basis of the contributions at some scholarly meetings. The editors of this volume, Odd Einar Haugen and Åslaug Ommundsen, present in the very readable introduction an overview of the Homily Book (AM 619 4°), written in Bergen in about 1200. In spite of the name it contains not only homilies, however, but must rather be characterised as a collection of edifying texts. It was previously published by C. R. Unger, George T. Flom and Gustav Indrebø, and a facsimile edition was published in 1952 by Trygve Knudsen. A more detailed account of the Homily Book—"for whom and for what?"—is given by Kirsten M. Berg, and this takes the form of a description of the environment where the book was compiled and the reason for the compilation. Somebody educated in England may be behind it and the book might possibly have been used in education in the Bergen Cathedral, although there are alternative interpretations, see below. Michael Gullick points to the English influence in the contribution about "Skriveren og kunstneren bak homileboken" ['The scribe and the artist of the Homily Book']. He underlines that on palaeographic grounds the origin of the manuscript can be dated to about 1200. Bas Vlam presents a calligraphic analysis of the Homily Book, which concludes with the observation that this is a book to be used and not an "ornamental book"—"[d]et er åpenbart en bruksbok fremfor en prydbok" (p. 113). Ranveig Stokkeland discusses whether one or more authors were involved in producing the manuscript, and elucidates how differences in the document *can* really be interpreted—the similarities are still so great in the Homily Book that, in spite of everything, it is likely that there was only one author. The Homily Book and some thereto pertaining liturgical fragments—"a fascinating relic from the Norwegian Middle Ages," as it is expressed (p. 149)—are examined by Åslaug Ommundsen, who states that these different manuscripts give evidence of the activities of a skilful and resourceful person who certainly played a great role in that period. The writer could read music and may have been a cantor in the clerical community where he worked. This community may have been either the Cathedral in Bergen, as mentioned above, or the Augustinian canons of St. John's, also in Bergen. The musicologist Gisela Attinger's analysis of the musical notation in antiphoner fragments in the National Norwegian Archives shows that the person who wrote the Homily Book was also involved in the origin of several of these fragments. In a contribution to the volume that I find fascinating, the Medieval Latin scholar Aidan Conti describes the manuscript as created in a contemporarily current "dynamisk pastoral kontekst som produserte materiale for aktivt å imøtekomme de siste trendene innenfor prekenvirksomhet og åndelig veiledning" ['dynamic pastoral context that produced material for actively complying with the latest trends in preaching activities and spiritual guidance'] (p. 186), and the role of the Augustinians in this context is stressed. Olav Tveito writes more generally about the English influence on the early Norwegian church; he has earlier worked with the Scandinavian missionary period. An interesting contribution by the art historian Kristin B. Aavitsland on what might be called "visual ability

to read" precedes the last study of the volume, Kirsten M. Berg's and Michael Gullick's investigation of the content and structure of the manuscript in question. This omnibus contains detailed English summaries, a list of certain technical terms, a coherent reference list and person and manuscript indices. The Old Norwegian Homily Book is elucidated from many perspectives and in an easily accessible manner in this well edited book. Like the previous parts of the series, it whets the appetite.

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Steffen Höder, *Sprachausbau im Sprachkontakt. Syntaktischer Wandel im Altschwedischen*, Heidelberg: Universitätsverlag Winter 2010, ISBN 9783825357030, 300 pp.

Steffen Höder's work is a result of the research project "Skandinavische Syntax im mehrsprachigen Kontext" at the University of Hamburg. As is well-known, great changes took place in the lexicon, morphology and syntax in the latter part of the Middle Ages, which made the Swedish of that time, as well as the other mainland Scandinavian languages, come to develop over time in a direction different from that of the insular Nordic languages, Icelandic and Faroese. The focus of this study is on the analysis of the Latin influence on the Old Swedish syntax, taking into account both language internal and language external factors. After an introductory chapter there follow three chapters (chapters 2–4) discussing Old Swedish language changes from three perspectives, namely historical, theoretical and functional perspectives. The language history background is described on a political, social and culture-historical basis, where among other things a late medieval social and individual bilingualism is discussed as well as the triglossia that involves Swedish, Low German and Latin. The points of departure that the thesis establishes in language contact research but also in construction grammar are clearly and thoroughly described, not least with the aid of models. As it turns out, the construction grammar basis makes it possible for the author to describe the variation that arises. It is also pointed out for example that linguistic phenomena that in the long term lead to grammatical change constitute "das Resultat der sprachlichen Kreativität individueller Sprecher" (p. 63)—this is a condition that really merits emphasising. Language functional aspects are then discussed, the problem of literacy–orality is dealt with and certain sociolinguistic points of departure are stressed. One of the hypotheses formulated at the very beginning is that text production results in

> eine eigenständige geschriebene Varietät des Altschwedischen, die sich von der gesprochenen Sprache in syntaktischer Hinsicht unterscheidet. Diese Unterschiede bedeuten wenigsten teilweise eine Annäherung der geschriebenen Sprache an das grammatische Modell des Lateinischen (p. 15).

In Ch. 5 the reader gets a thorough account of sources, treatment of linguistic data and annotation. The next chapter describes how the inventory of subjunctions is differentiated—the account of material (pp. 283–291) is not least informative, since both the inventory as such and the translation equivalents are accounted for here—, furthermore how changes take place

concerning the position of finite verbs and relative clauses and participle constructions. The analysis is made on the basis of the author's corpus and is both quantitative and qualitative, and this chapter is by far the most voluminous in the thesis. Naturally, there are many observations, and only a couple of them can be mentioned here. Among other things, one can see that in the period subjunctions are established that, unlike the earlier ones, are monosemic "und zuvor nicht subjunktional ausgedrückte semantische Relationen kodieren" (p. 162). In addition one can observe relativisation strategies that "eine Desambiguierung von Referenz im Text ermöglicht" (p. 230). A summarising chapter that also accounts for some still open questions concludes the thesis. This study provides a picture of important syntactic changes in Late Old Swedish and their relation to Latin—which is also critically discussed—, changes that the author tries to place in adequate contexts and connects to the previously presented theoretical points of departure.

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Lars Holm, *Till bords med biskop Jesper Swedberg. Mat och dryck i Swensk Ordabok (ca 1725). Med belysande utdrag ur samtida handböcker*, Skara: Föreningen för Västgötalitteratur 2010, ISBN 9789197807906, 135 pp.

Lars Holm has compiled here the c. 1,000 words in Jesper Swedberg's *Swensk Ordabok* ['Swedish Dictionary'] (the edition was presented in JNS 2, 2010, pp. 141 f.) that in some sense have to do with food and drink. The frameworks are wide: in addition to words for food and drink there are designations of raw materials, tools, preparation methods and professional people. The words have been systematised under fifteen headings, among others Birds, Fish and Shellfish, Wild Game, Bread and Pastry, Tastes and Spices, Milk Products, Strong Drinks, "Eat Food," Preparation and Keeping, Saturation and Hunger, Fasting, Gluttony and Drunkenness. A word index concludes the book. The book does not have strictly scholarly ambitions but there are nevertheless geolinguistic, word historical and semantic comments of interest. Geolinguistic notes are found about *sil*, 'liten fisk, silöga' ['herring, small fish'], and word historical ones about *åbrodd* ['southernwood'], where Holm attentively enough presents a section in Arvid Månsson's *En myckit nyttigh Örta-Book* ['A very useful Book about Plants'] (1654). Many times one realises the problems Swedberg encountered when "translating" some designations into Latin: for example *kalfdantz* he explains with "coagulum lactis crudi ex recente forda" [roughly 'curdled beestings just after the calving']. In connection with beestings pudding a piece of text from Kajsa Warg is rendered. That one could make wine of birch sap is well known: *biörklaka*, *biörksöta* are translated "lacrimæ betulæ," and here too there is a recipe from Kajsa Warg. Interesting observations can be noted in connection with certain verbs: *glödga* is translated "act. candefacio, item calefacio, coqvo, percoqvo," where the first Latin equivalent means 'mull' and the others 'heat (up),' 'boil (well).' The different words for 'fest' ['feast', 'party'] are accounted for: *gille*, *panket*, *disklag/matskap*, *collatz* och *gästabod*. The words for 'finbröd' ['fancy bread'] and 'dryckeskärl' ['drinking vessel'] respectively are presented each in a table by itself. In the

editorial information preceding the publication it was emphasised that Lars Holm here "has tried to combine scholarly correctness with an entertaining style, Swedberg would probably have called it *frode*—a word that according to his dictionary means both 'knowledge and pleasure.'" The style of the book is easy and fluent, and the numerous and long quotations from contemporary literature, chiefly from Kajsa Warg, also contribute to the ease and fluency. But the word historian too can apparently find a great deal of interest in this beautifully illustrated book.

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Ann-Marie Ivars, *Sydösterbottnisk syntax* (Skrifter utg. av Svenska litteratursällskapet i Finland 743. Studier i nordisk filologi 84), Helsingfors: Svenska litteratursällskapet i Finland 2010, ISBN 9789515832139; ISSN 00396842; ISSN 03560376, 319 pp.

Dialect syntax has played a rather modest role in Scandinavian dialectology, where phonology and morphology have instead attracted researchers. The network Scandinavian Dialect Syntax (*ScanDiaSyn*), which was started in 2003, implies a breakthrough for research on dialect syntax. A person who has obviously been inspired by ScanDiaSyn is Ann-Marie Ivars, who presents here a study of the syntax in Southern Ostrobothnia. The material on which the study is based was chiefly collected in Närpes, Övermark and Lappfjärd. The oldest informant in the principal material was born in 1883 and the youngest one in 1937. It is thus the syntax of more traditional speakers of the dialect that is accounted for. The description in *Svenska Akademiens Grammatik* ['The Swedish Academy Grammar'] constitutes a fundament, and in the monograph there are systematic surveys concerning nominal phrases, adjectival phrases, verb phrases, interjection phrases, subordinate clauses, main clauses, negation, dislocation–duplication–free annexes–adjunctional *så*, expletive *det* and complex sentences. On many points it is naturally a matter of more general descriptions, but there are parts where the author makes more profound analyses and conducts a discussion, and these sections are of course particularly valuable. In several cases Ivars has previously elucidated these problems in separate articles, for example in the journal *Svenska landsmål* 2004, 2006 and 2008 and in the Festschrift for Gerd Eklund in 2007 and for Erik Andersson in 2008. What besides these phenomena is of interest is for example the description of the syntax of the definite nominal phrase, that is widened use of the definite form of the noun (*hugga veden*; cf. Standard Swedish *hugga ved* ['chop the wood']), and incorporated adjectival attribute (*nybilen*; cf. Standard Swedish *den nya bilen* ['the new car']). Both phenomena have a northerly distribution in Swedish dialects. Another feature shared by the Northern Swedish and Ostrobothnian dialects are uninflected plural predicatives: the dialects mentioned have *dom vart* (*blev*) *trött*, Standard Swedish *de blev trötta* ['they got tired']. With rich exemplification Ivars can also show that the *s*-passive is used if the action is iterative or generic, but periphrastic passive is also found in the dialect. Concerning some phenomena—such as the narrative subordinating conjunctions—both geographic and age-dependent usage variation can be demonstrated. An interesting description is made of

spoken language phenomena such as dislocation, duplication, free annexes and adjunctional *så*. On the last pages of the book a dialect speaker tells a story, and in the narrative there are examples of several of the syntactic features that are dealt with in the monograph. Ann-Marie Ivar's monograph should be able to serve as a model for other monographs in which dialectal syntax is presented. The types of reflections on language history that are sometimes found in the book, such as for exemple in connection with the perfectual expressions (p. 168), as well as the geolinguistic comments that are made in various places, whet the appetite and could well have been more numerous and more systematically recurrent in the monograph. But already in its present shape it is an important dialectological work.

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Jon Gunnar Jørgensen & Lars S. Vikør (eds.), *Nordiskfaget. Tradisjon og fornying*, Oslo: Novus Forlag 2010, ISBN 9788270996230, 223 pp.

I connection with the journal *Maal og Minne* (henceforth: MM)—where Norwegian *maal* refers to Norwegian, later on Nordic, linguistics and *minne* among other things Old Norse philology, onomastics and folklore research—celebrating its hundredth anniversary, a seminar was held, whose proceedings have now been published together with some concluding articles about *Bymålslaget* and MM. By way of introduction an overview of Nordic linguistics is given by Hans-Olav Enger based on historical and critical perspectives worthy of attention. Odd Einar Haugen describes the Old Norse philology's development in Norway from the sixteenth century onwards, where in addition he predicts that "the historical questions will stand out as all the more enticing, because the answers are open, uncertain and demanding" (p. 51) in a period when texts from various social media are literally gushing over us. There are interesting ideas about language change in Helge Sandøy's contribution, which discusses the development of the Norwegian language from the Old Norse period to our time. Sandøy states that great changes chiefly seem to take place in the latter part of the Middle Ages, something that the author elucidates sociolinguistically (cf. my review of his book *Romsdalsk språkhistorie* in JNS 2, 2011, pp. 130 f.). Brit Mæhlum and Unn Røyneland write about studies of spoken urban language in a joint article. Not unexpectedly, Amund B. Larsen's early achievements are described here. The need for studies of multiethnic youth language, where so far only Oslo has been documented, is also underlined. Johan L. Tønnesson describes the growth of text linguistics and its development towards more ambitious cultural semiotics reflecting the interaction between text and context. Tom Schmidt writes about the status of onomastics in MM, and Olav Solberg about folklore research. An important contribution is Michael Barnes', entitled "Mål og metode i runeforskningen" ['Goals and methods in runic research']. He pleads wisely—and by presenting "cautionary" examples—for the view that "theory and methods should be our servants—not our masters." Barnes discusses runic orthography and the debate about it in a well-informed manner. In the final section one finds Einar Lundeby's article on *Bymålslaget* and MM up to 2002, complemented by Ruth Vatvedt Fjeld's survey of the

twenty-first century. This section also includes Jan Ragnar Hagland's survey of the proportion of contributions in MM concerning Old Norse philology, runology and folklore in different periods, and Svein Lie's corresponding study of the contributions concerning "new languages, language history etcetera." An introductory preface is signed by the editors. The book contains valuable overviews showing the development in several research areas. The critical perspectives that appear in several of the contributions are of special interest.

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Lena Lind Palicki, *Normaliserade föräldrar. En undersökning av Försäkringskassans broschyrer 1974–2007* (Örebro Studies in the Swedish Language 6), Örebro: Örebro University 2010, ISBN 9789176687222; ISSN 16539869, 172 pp.

An authority discourse that many Swedes have come into contact with is the one found in the brochures from the Swedish Social Insurance Agency targeted at expectant or new parents. This thesis analyses and problematises the conceptions of parents that are communicated in the texts—concretely the aim is "to discern who are pointed out, constructed and normalised as parents"—and shows how these conceptions have changed over time, concretely and in the period 1974–2007, when nine brochures have been published. In addition the thesis discusses what functions are ascribed the recipients and the senders respectively. Theoretical points of departure are taken from feminist discourse analysis, but the author also takes an intersectional perspective in the analysis. The current contexts are manysidedly analysed, and the discursive practice with its actors and the conditions applying to them—institutionally and politically and with regard to rules and regulations—are presented in great detail. In three empirical chapters the material is analysed from different perspectives. First the author tries to find out how the senders look upon the recipients, thus the identity construction. There are interesting discussions of the use of terms of address with *du* ['you', singular] and generic *man* or of third-person designations. The Social Insurance Agency's intention of using the *du* address is to promote communication with the citizens, but in actual fact this creates an inclusion, primarily of biological mothers, but at the same time an exclusion of other recipients, who may then appear to be *secondary* recipients of the message. According to the author the brochures using third-person designations as the primary recipient adaptation are the most gender equal ones, that is "have an even distribution of the representation of men and women" (p. 81). What the normal conception of parents is like is described in another chapter. Not unexpectedly the brochures make one think of a heterosexual relationship with Swedish parents who have got jobs and where the mother has the main responsibility for being at home with the children. What deviates from this is especially mentioned in the brochures. "The sender world" and the "recipient world" are finally analysed. The Social Insurance Agency has economic responsibility, which is chiefly expressed through passives and metonymies, which entails that the agent is linguistically concealed. The recipients—almost exclusively the parents—have the right on their side but they also have duties vis-à-

vis children and employers. It may be finally stated that the normal conception of parents seems to be more complex in the later brochures; the rules and regulations concerning the parents' insurance have gradually become increasingly complicated, but society is now also more multifaceted. This and many other things are brought to the fore in the thesis.

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Maria Löfdahl, Fredrik Skott & Lena Wenner (eds.), *Från sjö till hav. Namn- och ordstudier tillägnade Birgit Falck-Kjällquist*, Göteborg: Institutet för språk och folkminnen 2010, ISBN 9789172290716, 165 pp.

When the former Head of the Department of Dialectology, Onomastics and Folklore Research, Gothenburg (DAG) Birgit Falck-Kjällquist was 75 years old, this Festschrift was dedicated to her with eighteen contributions from Scandinavian colleagues. The toponym contributions dominate. Thorsten Andersson writes about the name *Sebende* in the parish of Söderby-Karl in the province of Uppland, which is assumed to refer to the stretch of a ridge—a "band"—close to the former beach; the attributive element corresponds to Old Swedish *sæ*, stem form of *sior*, 'lake, sea.' Lennart Elmevik argues that the Värmland lake name *Gapern* is an older **Gapi*, secondary to a river name **Gap*(*a*) of a small river, a hydronym that in its turn was formed on *gapa*, 'shout, scream.' Eva Nyman deals with hydronyms in *Snägd-* in the province of Medelpad, a study that besides discussing a name element also takes up principle issues in hydronym research. Several interpretation alternatives regarding *Tjäran* in the parish of Fasterna in Uppland are tested in Svante Strandberg's article, and Göran Hallberg deals with the use of the elements *hav* and *sjö* in the region of Skåne. Staffan Nyström writes about the archipelago name *Skoboraden*, which in his opinion would mean 'a number of islands associated with forest dwellers.' Some characterising hydronyms in Western Sweden (among others the lake names *Färgen* and *Skagern*) are analysed by Hugo Karlsson, while names of lighthouses along the West Coast of Sweden are dealt with by Maria Löfdahl. Mats Wahlberg describes how *Säfsen*—the name of a lake, later on a settlement and a parish in Dalecarlia—became *Säfsnäs*, but he has to leave the question open of *why* the new formation took place. Tom Schmidt discusses the appellative *bing*(*e*) and names in *bing*(*e*) in the Norwegian and other Nordic areas, and Botolv Helleland describes foreign elements in Norwegian topo-nyms such as *Jeriko*, *Jerusalem* and *Vaterlo*. Ritva Liisa Pitkänen deals with the question of the contacts between Finns and Swedes at the Gulf of Bothnia, and discusses some Swedish loanwords such as *knalli*, *krunni*, *oora*/*oura*/*oure* (< *ör* < *aur*) and *pultti*. Hyphenated names like *Falck-Kjäll-quist* are investigated by Eva Brylla, who also deals with personal name legislation in this context. There are also a couple of word studies among the contributions. Birgitta Ernby thus writes about a selection of boat builder terms recorded on Orust, among which for example the word *sy* ['sewing'] with regard to boat terminology is brought to the fore in a couple of places. The Swedish word *uppsjö*—and its development "from natural phenomenon to quantity term," to quote the subheading—is investigated by Birgit Eaker,

while Anki Mattisson discusses the question of (and problem with) hapax legomena in the *Svenska Akademiens ordbok*. A couple of contributions are outside the main theme of the book. In her article Anna-Brita Lövgren describes a human tragedy from the latter part of the seventeenth century based on an archive document, and Kerstin Thelander analyses Mrs Bennet's character in Jane Austen's novel *Pride and Prejudice*. The omnibus volume contains several contributions that, besides trying to solve individual research problems, also deal with questions of principle.

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Staffan Nyström (ed.), *Namn. En spegel av samhället förr och nu* (Ord och stil. Språkvårdssamfundets skrifter 41), Stockholm: Norstedts 2010, ISBN 9789113030814, 189 pp.

In this volume there are ten articles that elucidate the functions of names and their use in different societal contexts from the runic period to the present. The socio-onomastic theme is the cohesive element of the volume, but it is obvious that the articles were written with somewhat different levels of ambition. The introductory article is Gunnstein Akselberg's attempt at delimiting the socio-onomastic research area, where the numerous dimensions of the area are described and early Scandinavian works by, among others, Sven Benson and Eero Kiviniemi are mentioned. Five of the following articles are about place-names and four others about personal names. Terhi Ainiala deals with Somalians' names of streets, market places and parks in the district of Nordsjö in Helsinki, where for example the main street is called *Mogadishu Avenue*. Maria Löfdahl and Lena Wenner describe in a joint article the toponyms in the multicultural district of Angered in Gothenburg. An interesting aspect is what is said about children's toponyms. Contact onomastic perspectives are given by Aud-Kirsti Pedersen in the contribution "Stadnamn og identitet ved språkskifte" ['Place-names and identity in connection with language change'], where among other things fundamentally important issues are discussed concerning semantic transfer of toponyms in a multilingual community in relation to phonology. Based on his study *Ortnamn i stilistisk variation* ['Place-names in stylistic variation'] (2006) Staffan Fridell pleads for the use of a variation perspective in the valuation of different forms of toponyms. There is much to be said in favour of this, even if the forms at the same time must be regarded from the perspective of language change (cf. my review in JNS 2, 2009, pp. 136 ff.) The last article on toponyms is Svavar Sigmundsson's study of crofts and small houses on non-freehold property without appurtenant land. He describes a fairly unstable use of place-names, where names were coined after the owner but were changed when a new owner took over. Among the place-names there are some that refer to the inferior condition of the crofts (*Víti*, 'hell,' *Sudda*, 'something moist,' *Lúsakot*, 'louse croft' etc.). Magnus Källström's article on personal names in runic inscriptions is highly readable. He discusses in an interesting way the boundary between genuine parentonymica (that is patronymica and metronymica) and what might be more occasional explanatory additions. The relation between the word order in

the phrases and the right of inheritance is also discussed. In her contribution Emilia Aldrin discusses new parents' attitudes to names and identity and how this influences their choice of names. Guðrún Kvaran analyses the Icelandic name law of 1996 and the consequences it has had for the Icelandic personal name custom. Finally, Linnea Gustafsson discusses the function of pet names. The last three articles demonstrate the multitude of aspects that may be elucidated within the frameworks of socio-onomastics. The editor's introduction helps the reader to see the shared perspectives found in the different articles of the book, which might otherwise not be immediately discovered.

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Instructions to Authors

1. General Instructions

The languages of publication are English, French or German.

Articles should normally not exceed 60,000 characters in size, including spaces (c. 10,000 words). This should not, however, include references. But shorter or longer texts may be accepted if the length is motivated by the content.

Manuscripts should be double-spaced with wide margins, all pages numbered consecutively. The manuscript should be submitted electronically to the editor-in-chief in the format of a major word processing program for Windows or Macintosh, RTF or plain text format, via e-mail to the address lars-erik.edlund@nord.umu.se. Illustrations should be submitted as separate files, either via e-mail or on CD (see further below under *4.1 Illustrations and Maps*).

The manuscript should be accompanied by a separate sheet with a brief note on the contributor (50 words), institutional address, e-mail address, telephone and fax numbers and an abstract of no more than 200 words plus 10 or fewer keywords.

2. The Manuscript

Articles may be divided into sections if necessary. Each section should be numbered, using Arabic numerals with up to three decimals: 3.2.1. , 3.2.2 etc. or provided with section headings.

Short quotations should be incorporated in the text and surrounded with double quotation marks, and quotations within quotations should be surrounded with single quotation marks. Quotations of more than 30 words and quotations from plays or poetry should be indented on the left-hand margin and set off from the main text. Omitted text in quotations should be marked [...] and the author's interpolations should be enclosed by square brackets [xxx]. Emphasis should be marked by italics except in linguistic articles where bold type may be used instead. Words and names used meta-linguistically should be given in italics. Commas, full stops etcetera should be placed inside the closing quotation mark.

Quotations in other languages than English, French and German are permitted but must always be translated. Translations should be given within square brackets and should be surrounded by single quotation marks. Titles in other languages than English, French or German should likewise be translated in the reference list (see examples below, under 3. References).

References should be given immediately after the quotation, stating author, date and page as follows (Paasi 1996: 23). In reviews of a single work, only the page number needs to be given as follows (p. 14). Place the reference before the end of the sentence when integrated in the text but after the end of a block quotation. Separate the references with a semicolon when two or more works are referred to in the same parenthesis: (Paasi 1996: 23; Roesdahl 1998: 15). Avoid abbreviations such as *ibid.*, *op. cit.*, *i. e.* and *e. g.* Instead of *vide*, write *see*, instead of *viz.*, write *namely*.

Use indentation instead of a skipped line to mark the beginning of a new paragraph.

Notes should be numbered consecutively through the text and collected at the end of the article as endnotes.

3. References

Book
Paasi, A. (1996). *Territories, Boundaries and Consciousness. The Changing Geographies of the Finnish-Russian Border*, Chichester: John Wiley & Sons.

Edited book
Bäckman, L. & Hultkrantz, Å. (eds.) (1985). *Saami Pre-Christian Religion. Studies on the Oldest Traces of Religion among the Saamis* (Acta Universitatis Stockholmiensis. Stockholm Studies in Comparative Religion 25), Stockholm: Almqvist & Wiksell International.

Journal
Roesdahl, E. (1998). "L'ivoire de morse et les colonies norroises du Groenland," *Proxima Thulé. Revue d'études nordiques*, 3, pp. 9–48.

Chapter in edited book
Ränk, G. (1985). "The North-Eurasian background of the Ruto-cult," in *Saami Pre-Christian Religion. Studies on the Oldest Traces of Religion among the Saamis* (Acta Universitatis Stockholmiensis, Stockholm Studies in Comparative Religion 25), eds. L. Bäckman & Å. Hultkrantz, Stockholm: Almqvist & Wiksell International, pp. 169–178.

Conference proceedings
Fatychova, F. (2006). "Namenstraditionen unter den Baschkiren," *Proceedings of the 21st International Congress of Onomastic Sciences. Uppsala 19–24 August 2002*, vol. 2, Uppsala: Språk- och folkminnesinstitutet, pp. 89–95.

Newspaper
Palm, G. (1969). "De söp, dansade och älskade i vår märkligaste religiösa väckelse" ['They got drunk, danced, and made love in our most astonishing religious revival'], *Göteborgsposten* 12 October.

"Lärarinna säger upp sig för att flyga med kristallarken" ['Woman teacher resigns in order to fly with the crystal ark'], unsigned article in *Aftonbladet* 10 March 1935.

Electronic media
Grace, S. (2003). "Performing the Auto/Biographical Pact. Towards a Theory of Identity in Performance [paper delivered to ACTR conference, May 2003];" www.english.ubc.ca/faculty/grace/THTR_AB.HTM#paper; access date.

Unpublished dissertation
Smith, J. (1998). "Social Work Education in Scotland," diss., University of Glasgow.

References to several works by the same author, published the same year, should be numbered 2007a, 2007b, 2007c etc.:

Simmons, I. G. & Innes, J. B. (1996a). "An Episode of Prehistoric Canopy Manipulation at North Gill, North Yorkshire, England," *Journal of Archaeological Science*, 23, pp. 337–341.

4. Illustrations, Maps and Tables

Illustrations, maps and tables accompanying the article should be listed separately.

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Illustrations and maps should be numbered consecutively in Arabic numerals and presented with brief captions. The approximate placement of the illustration or map in the text should be stated in the article manuscript, and there should be a clear reference to the illustration or map in the text itself.

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Whether illustrations and maps are printed in color or in black and white is decided by the editors from case to case.

Unless the author has produced the illustration or map, the original source must be given. The article contributor is responsible for obtaining the right to reproduce the material. Permission should accompany the submitted article.

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6. Off-prints

The author or authors will receive altogether two copies of the journal containing the article and off-prints in the form of a PDF-document. Contributors to the sections *Notes* and *Reviews* will receive one copy of the journal. Authors may order further copies of the journal at a reduced price.