Journal of Northern Studies

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The Continuing Advance and Retreat of Rural Settlement in the Northern Inland of Sweden

ABSTRACT In 1960, a range of leading rural geographers started a debate about population development and the "advance and retreat" of human settlement in sparsely populated rural areas, including in the inland north of Sweden. In what came to be known as the "Siljan Symposium," they identified a number of key themes in relation to migration and human mobility that were thought to determine settlement patterns in the inland north, including: internal migration and urbanisation of populations; the role of simultaneous in- and out-migration in re-shaping settlement patterns; redistribution of rural populations through return migration and international migration; and changing preferences for settlement in different northern "zones" based on the methods for exploiting natural resources for agriculture, forestry, mining and energy production. This paper re-visits the main themes from the 1960 Siljan Symposium and examines Swedish register data

to identify how migration patterns and the resulting "advance and retreat" of human settlement have changed across the inland of Västerbotten and Norrbotten. The results suggest that, while general urban-rural and regional-local settlement patterns appear to have been relatively consistent, new forms of migration (including internal, return and international) with different preferences for rural settlement emerging in different localities as a result of both persistent (mining, forestry, energy) and changing (tourism, lifestyle) values of natural resources. We also observe substantial differences in migration and urbanisation rates between Norrbotten and Västerbotten. The paper then discusses how the persistence and discontinuity of experiences over the past decades may provide insights into the potential future patterns of northern settlement.

KEYWORDS migration, urbanisation, rural settlement, sparsely populated areas, northern Sweden

Introduction

In 1960, about twenty rural geographers who had attended the 19th International Geographical Conference in the Nordic countries, travelled to Lake Siljan in Dalarna County in Sweden to discuss advance and retreat of rural settlement. The *Siljan Symposium* resulted in a 1960 special issue of *Geografiska Annaler* containing 17 papers (Enequist 1960*a*), along with a paper by Kirk Stone (1962) published two years later in the *Annals of the Association of American Geographers*. While the *Symposium* featured presentations from Scotland, the United States, Canada and Germany, eleven of the papers were specific to "northern Sweden," considered as everything north of Stockholm and away from the Bothnian coast. The southern parts of this region had begun to experience general population loss, and the *Symposium* explained this essentially as a "retreat" of population from smaller rural settlements and isolated homesteads and an "advance" of urban settlement. At the same time, the far north (the counties of Västerbotten and Norrbotten) was still experiencing general population growth, but also a "retreat" of population from some rural areas. The argument was made at the *Symposium* that the northern inland areas would, in short order, follow the experience of the southern areas with more general population loss (Norling 1960). At a broad level, this was a prescient assumption, given that the inland north began to lose population early in the 1960s, and has continued to lose population since.

The purpose of this paper is to re-visit the *Siljan Symposium* and the explanations given for the "advance and retreat" of human settlement in the inland north (see Fig. 1) to establish whether they have parallels in more

recent experiences. Much has changed in the political, economic and cultural life of the north since 1960, and while some of these changes were foretold at the *Symposium*, there is a possibility that other changes have substantially impacted settlement patterns in ways different to those described at that time. By reflecting on the dis/continuity of northern experiences across essentially a 60-year period, the paper aims to chart the progression of both theoretical and empirical understandings of the human geography of the inland north. Such understandings are not only important in the development of theory, but may have practical implications as countries like Sweden continue to debate how northern sparsely populated areas could or should be "developed."

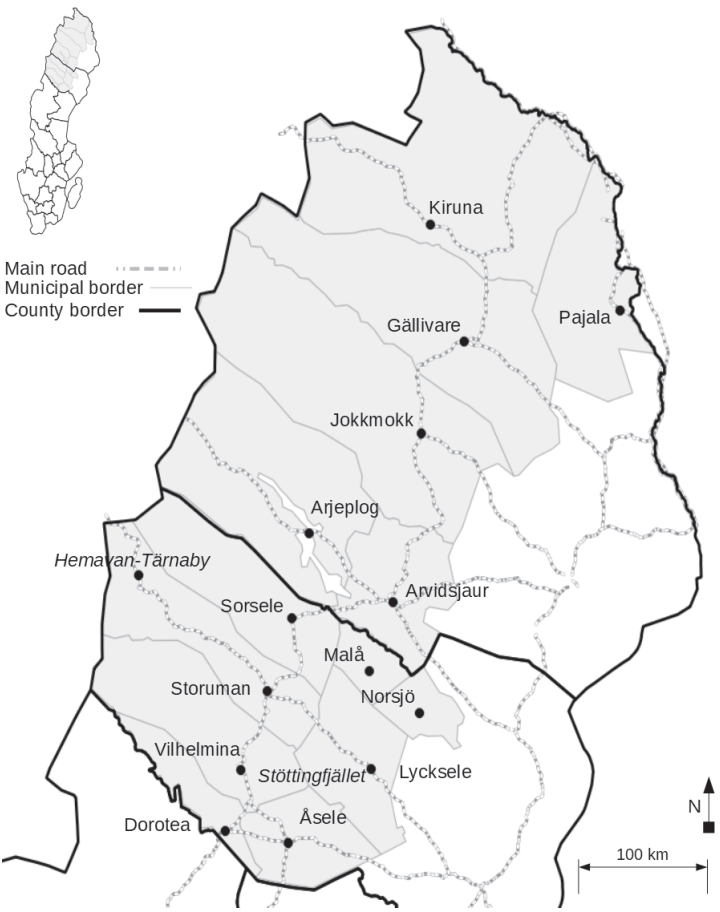

Fig. 1. The "inland north" for the purposes of this paper.

The paper commences with a summary of the key themes of the *Siljan Symposium*, with a focus on its treatment of mobility and migration as determinants of settlement patterns. Those themes are then connected to more recent literature to suggest ways in which we might expect contemporary experiences to be similar or different to those both observed and foreshadowed at the *Symposium*. The paper then empirically investigates some of the more prominent topics of agreement and contention between *Symposium* and recent scholars, using data from Statistics Sweden and Umeå University's ASTRID database (covering the period 1985–2012). The paper concludes with a discussion of how the persistence and discontinuity of experiences over the past several decades may provide insights into the patterns of northern settlement that might be experienced into the future. An important limitation of this paper is that it focuses on registered "residents," meaning that very important impacts of more temporary or "multi-locale" occupation arising from second homes, seasonal work, and tourism cannot be empirically investigated with the available data. Some analysis of how these somewhat hidden settlement patterns were treated at the *Symposium* and in more recent scholarship is provided in part to flag the continuing need for improved understandings of how they shape the north.

Key Themes from the *Siljan Symposium*

The *Symposium* described both regional and local patterns of advance and retreat. At a regional level, retreat (resulting in population loss at the municipal level) was then occurring in Dalarna and proximate counties in the more southerly parts of the "north," while regional advance continued in the more northerly areas which were still being developed for forestry, energy production, and mining, and were consequently experiencing population booms associated with the construction of infrastructure (including transport and communications) for those industries. However, even in areas of regional "advance" there were pockets of local "retreat" as small-scale agriculture became less economically viable and workforces for the dominant industries became more centralised. As a result, advance and retreat generally favoured population agglomeration in urban centres and population loss from small villages and isolated farms (Norling 1960). The pattern was more or less dramatic in different parts of the north, with the westerly mountain areas less able to support even remnant agricultural production, and the far north (Norrbotten County) more impacted by mining and hydro-power projects than the "not-so-far" north (Västerbotten County) (Enequist 1960*b*). Even in Västerbotten, however, the substantial disruption caused by hydro development to transport net-

works and accessibility was one of the major determinants of changes in settlement patterns at that time (Norling 1960).

Stone (1962) particularly investigated these regional distinctions, describing a four-zone typology of the north, collectively positioned as being on the "fringe" of Swedish society (see Fig. 2). The "inner fringe" zone (1) covered the coastal areas which were even at this time well populated and well connected both to the south of Sweden and international trading routes. Of greater interest to this paper are the three remaining zones which cover the rural inland. Stone was somewhat conflicted in his attitudes to the middle zone, which incorporates the large forest areas adjacent to the coastal settlement areas. The middle zone (2) was also susceptible to settlement retreat because of the relatively large number of people who had unsuccessfully attempted (with the assistance of government policy and relatively easy access) to develop agriculture there as a result of the patchiness of land quality. Norling (1960) identified two specific sites where total depopulation was likely—one in the mountain areas south of Tärnaby (in the outermost fringe zone), and the other in the Stöttingfjället (a small mountain range south and west of Lycksele in the middle zone). These sites were not particularly useful for agriculture, forestry, or energy development, and had not had such a successful history of settlement that historical forces or "inertia" would enable settlement to persist.

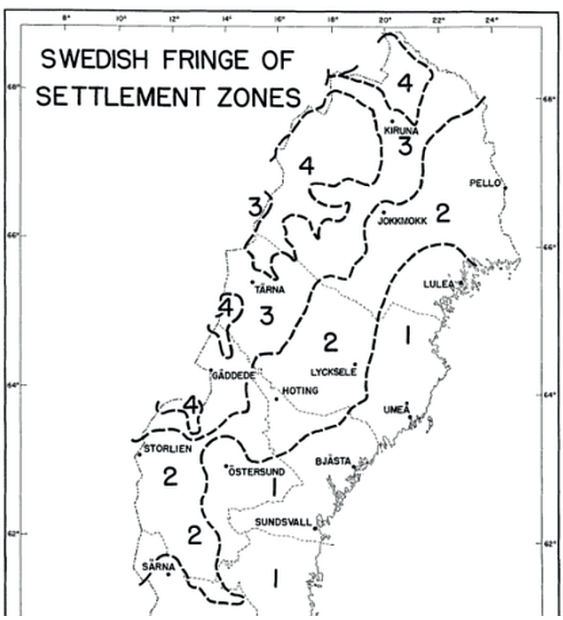

Fig. 2. Swedish "fringe" zones (northern portion) according to Stone (1962: 376).

Stone (1962) was less equivocal in his prognosis for the outer (3) and outermost fringe (4) zones. Neither, he asserted, should be considered as sites for new settlement, and, for the outermost fringe,

> [...] the problem at the present time is not the consideration of new settlement [...] rather it is to determine whether or not the present settlers should even be encouraged to stay, for any reason. (Stone 1962: 392)

The call to change settlement policy to discourage northern settlement and even encourage out-migration was echoed by Aldskogius (1960) and Eriksson (1960). Eriksson claimed that there could (and should) be a regional retreat of people in order to stimulate new economic development. A retreat of people who were not engaged in new economic activities (industrialised forestry, energy production) would open up room for the in-flow of fewer but more economically valuable people. Porenius (1960) also depicted areas experiencing population loss as nonetheless having simultaneous increases in out-migration (as expected) and in-migration (which was not expected).

While Aldskogius (1960), Eriksson (1960), and Porenius (1960) talked about the arrival of new people from outside the north to help shape new settlement patterns, Norling (1960) and Lindberg (1960) identified the significance of internal migration in localised advance and retreat of northern settlement. In Norling's (1960) analysis of migration in Västerbotten and Norrbotten from 1930 to 1960, over half of the settlers who abandoned isolated farmsteads and smaller villages remained within the same local government area, and about half of these moved to very nearby settlements. Lindberg associated this localised movement with a high degree of attachment to the region from its inhabitants. Many people, he argued, had "abandoned" houses to look for off-farm work in even distant places, but would return regularly, and would, if given the opportunity, return permanently as a matter of preference. In particular, when previous permanent inhabitants "grow old they want to settle down and live where they were born and have their small holdings" (Lindberg 1960: 266).

This coming and going of residents meant that apparently abandoned houses and even small villages were from time to time re-used either temporarily or more long term (Aldskogius 1960). Re-settlement was made possible by improved transport access and lesser need for rural properties to generate substantial income. The settlement infrastructure, however, was also valuable to the forestry industry, which used abandoned houses and settlements for temporary workers' camps. Mining and energy companies also often built their company villages and camps around abandoned settlements because of their existing infrastructure (principally roads, but also

buildings and services). Even new forms of farming enabled older settlements to be re-inhabited (Bylund 1960).

There was very little discussion about international migration to the north, with Montelius (1960) examining Finnish migration to the Dalarna region. What was interesting about Montelius' (1960) analysis, however, was the claim that international migrants like the Finns would be likely to occupy the land in different ways to Swedish locals and Swedish migrants. International migrants, according to Montelius, would likely bring with them different technologies and different ambitions for exploitation of the north's resources, and so adapt to settling in different locations. Ultimately, however, they may be driven to larger settlements as it became too expensive to provide smaller ones "with for example electricity, telephone, schools" (Montelius 1960: 293). International migrants might also be expected to cluster in particular locations to access religious institutions, repeating the experience of early Swedish settlers and explaining, in part, why some areas with poorer natural resources continued to be occupied while areas with relatively good resources were not (Bylund 1960).

Examination of changing patterns of temporary mobility, and their impact on settlement structures is beyond the scope of this paper. However, participants in the *Symposium* identified some links between permanent and temporary habitation that warrant attention. Aldskogius (1960) in particular noted that many "abandoned" houses were actually houses that were never permanently occupied, but were second or third or fourth residences used at specific times of the year as economic activity shifted from lowland to highland areas. Likewise, mining settlement in Västerbotten in particular involved mines and forges that were often quite distant from one another, with people moving between them on a regular basis. As technology improved and workforces for activities like forestry and energy generation became more specialised, seasonally present (and absent) labour become more common. Mobility has also been a characteristic of Sami settlement of the north, although this topic was not broached at the *Symposium* apart from a note by Stone (1962) that Sami people could successfully occupy the outermost fringe zone because of their mobility.

Contemporary Themes

In migration studies there has been a focus on economic activity as motive for migration (Lundholm 2007). This has tended to put agriculture in focus for settlement patterns in rural areas, however, the primacy of agriculture in shaping settlement patterns in the north has been questioned by, among others, Hedlund (2016). Hedlund claimed that manufacturing (particularly related to the forestry sector), mining, and (later) tourism and social ser-

vices, have been much more significant drivers of advance and retreat of settlements since the 1960s. Despite taking up the story at a later point in time, the essential conclusions from Hedlund's (2016) work closely resemble those from the *Symposium*. The *Symposium* argued that the transition from agriculture to other economic activities led to urbanisation, fragmented development, and the localised influences of activities such as mining, energy development and tourism. Even accounting for a lesser initial importance of agriculture as something to transition from, Hedlund's (2016) maps of the economic geography of the north conform quite neatly to those proposed by Stone (1962), Norling (1960) and other *Symposium* geographers. What has changed, however, is the positioning of the westernmost (or "outermost") fringe, with the rise of tourism as an economic activity in a very localised way in places like Hemavan and Tärnaby. Smaller resorts, however, in Kittelfjäll, Ammarnäs and other even quite proximate locations have struggled to develop (Byström & Müller 2014; Lundmark 2005).

One major change within migration and mobility studies is that more contemporary research has given more attention to lifestyle oriented motives and not only economic motives for mobility. This change in focus could be explained by three major societal developments: The general affluence of western society that has made mobility choices based not solely on economic necessity but also on lifestyle choices; post-productivism as the "new rural future" concentrating on knowledge, service and experience instead of traditional production; a general focus in society as well as in research on the environment and issues of sustainability (Almstedt *et al*. 2014). Taken together, these developments have allowed for diverse perceptions of which areas that are perceived as attractive. In tourism research, areas with abundant natural amenities have for long been in focus because of the attraction it offers to mobile populations (Moss 2006), but now this has come to include more permanent mobilities as well.

One form of tourism that is substantial is the winter car testing industry, concentrated primarily around municipalities of Arvidsjaur and Arjeplog. The industry developed from the early 1980s when car testers would come from Germany (mostly) during the winter months, and camp near frozen lakes to conduct their testing. As the industry grew, local businesses began to provide more support services (including managing the lake test beds), and visitor accommodation became primarily focused in the larger municipal centres. Exceptions such as the large hotel in the small village of Slagnäs (population c. 120) exist, but the typical pattern remains urbanisation of the permanent and seasonal workforce. Even in Slagnäs, car testing tourism has been insufficiently impactful to stimulate local residential population growth. After rapidly expanding during the 1990s and 2000s, the workforce

for the car testing industry has begun to shrink as fewer but more skilled people are needed to undertake the activities. Even some "local" (meaning Swedish owned/operated) businesses are based outside of the region and operate here just for the winter months. This pattern of maintaining local economic activity, but with fewer local residents involved (Enequist 1960*b*) has also been observed in the energy sector (Carson *et al.* 2016*a*) and mining services (Dubois & Carson 2017).

Car testing as industrial tourism has contributed to the development of more leisure based forms of tourism, including ice lake driving and the in-migration of German, Swiss and other European entrepreneurs establishing small businesses offering husky or snowmobile tours and other largely winter based experiences (Carson, Carson & Eimermann 2017). Many of these businesses are located outside of the larger towns and villages, as the business owners look not just to provide a "real" northern experience to their customers, but themselves seek isolation and wilderness for both their working (winter) and recreational (summer) seasons. These migrants echo the experiences of the Finnish migrants observed by Montelius (1960) in undertaking activities that local people generally do not do, and in places that local people generally have been moving away from. Vuin (2018) notes that other migrants also continue to move into smaller villages (even in places like the Stöttingfjället) even as out-migration remains the dominant trend, continuing the concurrent process of advance and retreat observed by Porenius (1960).

Just how many of these "isolation seeking" migrants there are has yet to be established, and Hedlund *et al.* (2017) note that the vast majority of international migrants continue to settle in the larger centres, and may find it difficult to engage effectively in the economies that exist there. In recent times in particular, a large proportion of international migrants have come to the north for non-economic reasons, as refugees and asylum seekers from Africa and the Middle East. It is expected that many of these will only stay a short time, and will remain when they are here in the larger towns which have language, education and other integration services.

Large projects in mining in particular continue to be proposed right across Västerbotten and Norrbotten, but remain more common in the latter. As demonstrated by Knobblock and Pettersson (2010) there might be some pitfalls in the statistics concerning employment related to mining since a restructuring of the sector during the 2000s entailed a shift of employed out of mining and in to private subcontracting companies that were not connected to mining in the statistics. This fact has been largely overlooked by many researchers and Knobblock and Pettersson conclude that there has actually been a small increase in the number of employed from 2002. Gen-

erally, however, the mining sector has been reduced in size since the 1980s, particularly in Västerbotten with the end of multiple projects in the Skellefte basin. Some small projects remain from that era, and there have been numerous, but typically small-scale, new projects across the region since. In Norrbotten, large-scale activities continue near Kiruna, Gällivare, and Pajala, but even these are accompanied by occasional "advance and retreat" of population as projects are suspended or expanded, and whole towns are moved to make way for that expansion or because of mining-caused damage to infrastructure (Tano, Pettersson & Stjernström 2016).

There continues to be limited attention paid to Sami human geography in the north, partly at least because of a lack of quantitative data about the Sami population (Axelsson 2011). Some Sami people continue to be involved in the reindeer husbandry sector, and there is some evidence that reindeer herds are being consolidated (in herding practice if not always in terms of number of owners), and the bases for the sector becoming more urbanised (Leu 2018; Sköld 2015). Non-reindeer herding Sami may also be having a larger impact on settlement patterns in recent times, with people in the arts and media sectors moving "back" north after starting working life in the south. Places like Jokkmokk in Norrbotten are quickly becoming hotspots of Sami arts, culture and tourism (Müller & Brouder 2014; Müller & Pettersson 2006).

The general discourse in the literature since the 1960s has had a strong focus on those who move away from the north, particularly young people and women (Carson *et al.* 2016*b*), but there is also some recent evidence that people continue to move back, and at different life stages (Vuin 2018; Johansson 2016; Lundholm 2012). The drivers for this return migration are not well understood, but may include family and social attachment, seeking employment in a familiar environment, inheritance, or more generally the renowned Swedish attraction to the country-side. How many people move back, to which settlements, and at what life stages, is not understood in detail. It is possible that, like refugee migrants, return migrants remain back in the north for just a short period of time, blurring the line between "temporariness" and "permanence." Temporary mobility based on second homes, seasonal employment, and family and social responsibilities has long been a key feature of human geography in the north, and as such continues to attract attention in the literature (Müller & Marjavaara 2012; Lundmark 2006; Lundmark & Marjavaara 2013).

Framing the Research

There are many similarities between themes from the *Siljan Symposium* and more contemporary literature. At a broad level, six persistent factors have contributed to settlement patterns in the inland north:

1. Centralisation of infrastructure and workforces (these even often "centralised" to somewhere outside of the region) as the economy first industrialised and later increased its reliance on post-productive activities;
2. Path dependency, whereby existing (larger) settlements continue to attract population even if they are not in the most favourable locations, and few if any new settlements are likely to emerge;
3. Simultaneous in- and out-migration as key factors in shaping and re-shaping settlement patterns;
4. Redistribution of population within the region, including through return migration;
5. Diversity of migration and settlement behaviours of international in-migrants; and
6. Changing preference for settlement in different "zones" within the north, based on land use and accessibility. Different experiences have been had in the north (Norrbotten) and south (Västerbotten) and the east and west, and along rivers harvested for hydro-power and transport and communication lines.

A regional pattern of urbanisation and population loss has emerged from these factors, but they may have also caused diverse local experiences, creating a diversity of northern settlement which has been examined in qualitative terms, but rarely quantified (with the exception of Hedlund's [2016] economic zones). A conceptual model of how settlement in the inland north may change in the future therefore requires a more detailed understanding of the ways in which these six factors are acting in concert or opposition, and their local as well as regional implications.

The human geography of the Swedish north has continued to be compared to other places around the world. While the *Symposium* focused on western European comparisons, there were also some comparisons with what might be considered more "remote" areas in North America. In recent times, it has been more common to compare the Swedish north with other Arctic regions (including North American Arctic regions) and other "remote" areas in places like Australia (Carson *et al.* 2011; Taylor 2016). These comparisons have re-emphasised some of the features of advance and retreat of settlement that have been highlighted in this introduction. Human geography in places like the Swedish north has been considered to be "dynamic," being under the influence of constantly changing forces related to migration and mobility. These forces may be related to the origins and destinations of migrants, their lengths of stay and settlement locations, and their reasons for coming and going. All of these are "diverse," and it is com-

mon to find substantially different experiences (such as high or low population turnover rates) in even proximate settlements. These differences, as Bylund (1960) noted, are "dependent" on what the land is used for (mining, forestry, energy production), with these activities often being very localised (at least at specific points in time). As a result, simply describing what the *Symposium* termed regional patterns of advance and retreat (Enequist 1960*b*) overlooks local "detail" which may ultimately be more important in determining conditions in the long run.

Methods

Data were drawn from the Statistics Sweden Statistical Database (www.statistikdatabasen.scb.se) concerning population size of municipalities and population centres (with more than 200 residents) from 1960 to 2016. The Statistical Database was also used to access summary migration data (number of in- and out-migrants) by municipality for the period 1968–2016.

Additional data were drawn from the ASTRID database hosted at the Department of Geography and Economic History at Umeå University in Sweden. For the purposes of this research, data entered into ASTRID from Swedish population registers and covering the period 1985–2012 were used. Data were geocoded according to postcode area (175 in the region of interest) and municipality (14). Data items included the postcode and municipality of residence for each year between 1985 and 2012, country of birth and year of birth. Country of birth was recoded into eight major groups—Sweden, other Nordic countries, Western Europe, Eastern Europe, Africa and the Middle East, Asia, and the remainder. Postcodes were considered classified as either being in, or principally in, the municipal administrative centre (which was also the largest town in each municipality and, with the exception of Gällivare, the only town with 1,000 or more residents in 2012) or being outside of the municipal centre (and termed "rural" for the purposes of this research). Migration rates were calculated as the volume of migrants as a proportion of the resident population in the most recent year being considered.

Results

Regional Urbanisation, Population Loss and the Emergence of New Settlements

In 1960, about 33% of the regional population lived in the municipal administrative centre. This increased to over 60% by 2015. In 1960, there was a smaller proportion of the Västerbotten inland population (30%) in administrative centres than in Norrbotten (36%), but both sub-regions passed 50% by 1975, and have had similar proportions since then. Relative growth in administrative centre population averaged over 5% each five years between 1960 and 1980, but has slowed since then, increasing by only 5% in total

between 2000 and 2015. All municipal centres increased their share of the municipal population throughout the period, although Kiruna (the largest and most dominant centre, with already 70% of the municipal population in 1960), has lost share since about the year 2000 (from 80% to 74% in 2015).

Norling (1960) focused on the share of the population living in urban centres of particular sizes. He anticipated that, with few exceptions, smaller centres (with fewer than 1,000 residents) would house less of the population over time. In 1960, there were 48 urban centres with populations between 200 and 1,000 residents (smaller centres have not been consistently recorded across the whole period) which collectively housed 13% of the population. In 2016, there were 21 such centres housing 9% of the population. In contrast, while there were also fewer larger urban centres in 2016 (15) than in 1960 (20), their share of the population increased from 43% to 66% during the period (see Table 1). The shift in population share from smaller to larger centres has been more dramatic in Västerbotten than in Norrbotten. Two urban centres, Messaure in Jokkmokk municipality (built to house hydro-power construction workers and their families in the 1960s and 1970s) and Adakgruvan in Malå municipality (built to house mining workers and their families at about the same time), were completely de-populated during the period.

Table 1. Number of urban centres and population share, 1960–2016.

Centre size	Number of centres		Number of inhabitants		% of total population	
	1960	2016	1960	2016	1960	2016
Fewer than 200			68,367	24,119	44	25
200–999	48	21	20,495	9,013	13	9
1,000+	20	15	68,270	64,650	43	66
Norrbotten						
Fewer than 200			32,686	12,776	34	21
200–999	30	15	12,680	6,964	13	11
1,000+	12	7	49,839	41,922	52	68
Västerbotten						
Fewer than 200			35,681	11,343	58	31
200–999	18	6	7,815	2,049	13	6
1,000+	8	8	18,431	22,728	30	63

Table 1 shows that overall there has been a decrease in actual population in the larger urban centres, even as their population share has increased. This was not the case in Västerbotten, however, where the larger centres (consistently solely the municipal centres) grew from about 18,500 residents in 1960 to nearly 23,000 in 2016. However, even in Västerbotten, all municipal

centres have lost population since 1995. Only Lycksele has had a period of population growth (0.4% between 2010 and 2015). In Norrbotten, the picture is more mixed, with periods of rapid growth and decline associated with expansion and contraction of mining projects, and population growth everywhere except Kiruna since the early 2000s. That growth has not, however, led to growth in the municipal populations as a whole, with, interestingly, Kiruna the only municipality to experience any population growth in any five-year period between 1960 and 2015 (growth between 2% and 6% between 1960 and 1975, and 1% between 2010 and 2015). Overall, quinquennial rates of population loss across the region have varied from 2% to 7%.

While Table 1 shows that the number of urban centres with populations between 200 and 1,000 has declined since 1960, there are three centres which have grown to this size during that period. Tjautjas (population 237 in 2016) is a lakeside village in Gällivare municipality, about 20 kilometres from the mining town of Koskullskulle (population 835), and has become an alternative place of residence mostly for mine workers. Hedlunda (population 205) is on the outskirts of Lycksele town (where the airport is located) and may be better thought of as a suburb of that town. Hemavan (population 263) in Storuman municipality, reached 200 residents by 2005. Hemavan is a ski tourism resort which has received substantial investment from government and private industry since the turn of the century (Müller 2013). Apart from Tjautjas and Hemavan, no smaller urban centre has increased residential population since the year 2000.

Simultaneous "Advance and Retreat"

There was net positive migration to the region as a whole in just 17 of the 49 years since 1968. There were more net positive migration years for Västerbotten (20) than Norrbotten (15), with Dorotea (28) and Vilhelmina (23) having the most net positive migration years among the individual municipalities. However, there was net positive migration for the region as a whole, and for Norrbotten and Västerbotten sub-regions every year in the decade 2007–2016, and all municipalities except Storuman and Jokkmokk (5 years each) had net positive migration in over half of the years in that decade.

In 36 years across the entire period, in-migration and out-migration rates both increased or decreased. The overall correlation between in-migration rates and out-migration rates was 0.65 (very strong), and 0.62 in Västerbotten and 0.55 in Norrbotten. While in 34 years, in- and out-migration rates changed in the same direction in more than half of the individual municipalities, the municipal experiences were quite varied. There were very small negative correlations between in- and out-migration rates across the entire period for Norsjö, Åsele and Arjeplog, but very strong posi-

tive correlations for Dorotea, Lycksele and Gällivare. All other municipalities had weak positive correlations. On two-thirds of the occasions that in- and out-migration changed in the same direction, there was an increase in both. This was the case in both Norrbotten and Västerbotten, but in Malå and Jokkmokk, there were more years when migration rates decreased together than increased together. Likewise, in 29 years, the most common simultaneous change was increase in both in-migration and out-migration rates.

Internal Re-Distribution

Between 2011 and 2012, 12,240 residents migrated into or out of a postcode in the northern inland region. Just over 40% of these moved from one postcode to another within the same municipality, and a further 5% moved to another postcode in the northern inland region.

Table 2. Spatial characteristics of migration to and from northern inland postcodes, 2011–2012.

Characteristic	Population	%
Migrants	Total 2012 population	12%
Migrants within the same municipality	Total migrants 2011–2012	41%
Migrants within the inland north	Total migrants 2011–2012	5%
Migrants from the remainder of Västerbotten and Norrbotten County	In-migrants (excluding migrants within municipalities) 2011–2012	26%
Migrants from outside of the two counties	In-migrants (excluding migrants within municipalities) 2011–2012	54%
Foreign born in-migrants	In-migrants (excluding migrants within municipalities) 2011–2012	33%
Migrants to the remainder of Västerbotten and Norrbotten County	Out-migrants from the northern inland region	55%

About 62% of in-migrants (excluding migrants within a municipality) moved to the municipal centres, which was higher than the municipal centre share of the population in 2012 (58%). About 64% of out-migrants were leaving municipal centres. About two-thirds of migration within municipalities was either from one part of the municipal centre to another or from one rural area to another. Otherwise, a higher proportion (20%) of internal migrants moved from a rural area to the municipal centre than moved the other way (15%). Within the northern inland region as a whole, migration also slightly favoured moves from rural to municipal centres (24% compared to 22% moving from municipal centres to rural areas). However,

while moves within a municipality were divided such as to maintain the municipal centre-rural population split, migration from other parts of the inland north provided a net population increase to rural areas. Migration of foreign-born residents (65% of whom moved to municipal centres) slightly favoured municipal centres. Overall, migration flows to municipal centres were larger than the municipal centre share of the resident population in all municipalities except Kiruna (where only 41% of migrants moved to the municipal centre, while 57% of the population lived there) and Gällivare (70% of migrants compared with 74% of residents). Migration most favoured the municipal centres in Sorsele (75% of migrants compared with 47% of residents), Arjeplog (85% compared with 63%), and Dorotea (71% compared with 57%).

Return Migration

About 16% of the 2012 regional population aged three years and older had lived in their current municipality on at least one other occasion since 1985 (see Table 3). Return migration rates were higher in Norrbotten than in Västerbotten, and highest in Pajala (21%) and Kiruna (20%). About 13% of return migrants had moved away and returned at least twice, and some (about 50 in total) had lived in the municipality on at least four different occasions during this period. Norsjö (23%) and Jokkmokk (17%) had the highest proportion of return migrants who had had multiple periods of residency in the municipality.

Rates of return migration appear substantially higher for those aged 15–29 years (when they most recently returned). A number equal to 36% of the population aged 15–29 years in 2012 had returned when they were in this age group. There were comparatively very low rates of residents returning aged 65 years and over (a number equal to 4% of the 2012 population aged 65 years and over). Municipalities in Norrbotten had higher return rates for people aged 50 years and under, while rates were similar in the two counties for older people.

More residents would be expected to have returned in more recent years as earlier returners increase their likelihood of migrating out once again, or dying. While this is generally true, there were also some specific years where higher than expected numbers of 2012 residents returned. Most striking is 1998, a year in which 6% of 2012 return migrant residents returned (with just 3% in 1997 and 1999). This "break in trend" is accounted for largely by high numbers of return migrants to Gällivare, Jokkmokk and Kiruna arriving that year (probably associated with increased mining activity).

Return migrants were equally likely to be living in the municipal capitals as were other residents (58% did so). Older return migrants (by age in

Table 3. Characteristics of return migrants to northern inland municipalities, 1985–2012.

Municipality	Return migrants (% of 2012 population)	Multiple returns (% of return migrants)	Aged <14 (% of 2012 population)	Aged 15–29 (% of 2012 population)	Aged 30–49 (% of 2012 population)	Aged 50–64 (% of 2012 population)	Aged 65+ (% of 2012 population)
Norsjö	11%	23%	3%	27%	17%	7%	3%
Malå	14%	12%	7%	37%	19%	8%	4%
Storuman	15%	10%	6%	39%	21%	12%	4%
Sorsele	16%	11%	3%	32%	21%	17%	5%
Dorotea	16%	10%	7%	28%	25%	16%	5%
Vilhelmina	14%	11%	4%	31%	19%	10%	5%
Åsele	14%	12%	6%	29%	21%	15%	5%
Lycksele	14%	13%	4%	32%	17%	8%	5%
Arvidsjaur	14%	13%	4%	31%	18%	12%	5%
Arjeplog	17%	12%	7%	31%	28%	15%	4%
Jokkmokk	14%	17%	10%	30%	22%	9%	4%
Pajala	21%	11%	7%	34%	39%	23%	7%
Gällivare	16%	15%	8%	36%	23%	7%	3%
Kiruna	20%	14%	10%	45%	26%	7%	3%
TOTAL	**16%**	**13%**	**7%**	**36%**	**23%**	**10%**	**4%**
VÄSTERBOTTEN	**14%**	**12%**	**5%**	**32%**	**19%**	**10%**	**5%**
NORRBOTTEN	**17%**	**14%**	**9%**	**38%**	**25%**	**10%**	**4%**

2012) were more likely to be living outside the municipal centre than were younger return migrants, and only 48% of return migrants aged 65 years and over lived in the municipal centres (compared with 55% of the total population). In contrast, return migrants aged 3–14 years were more likely to be living in municipal centres (65% did so) than the total population in this age group (60%).

International Migration

The proportion of foreign-born residents in the inland north more than doubled between 1960 (approximately 2%) and 2000 (5%) and doubled again between 2000 and 2017 (10%). In the most recent year for which there are detailed data (2012), 8% of the region's population were foreign-born. Rates of foreign-born population were similar across all municipalities, with Pajala and Sorsele (12% each) having substantially higher rates, but with only Storuman (5%) having less than 6%. Foreign-born residents were more likely than the Swedish-born population to be living in the municipal centres (61% compared to 57%), but there were some rural postcode areas with high proportions of foreign-born residents (see Fig. 3). These include areas in Pajala with more than 20% of the population foreign-born, but also areas in Jokkmokk, Arjeplog, Norsjö and Dorotea with more than 15%. At the same

time, areas with very low proportions of foreign-born residents (less than 5%) were exclusively rural areas.

Rural areas generally experienced the highest increases in foreign-born population between 1985 and 2012, with increases of over 10% (share of the total population) in rural parts of Kiruna, Sorsele and Åsele along with the "hotspots" in Jokkmokk, Arjeplog and Dorotea identified in Fig. 3. Growth in the foreign-born population was experienced everywhere except Arvidsjaur and Norsjö (in both cases, foreign-born residents had about 2% lower share of the resident population in 2012 compared with 1985).

While the number of foreign-born residents from other Nordic countries decreased in absolute terms from 4,500 in 1985 to 3,000 in 2012, there

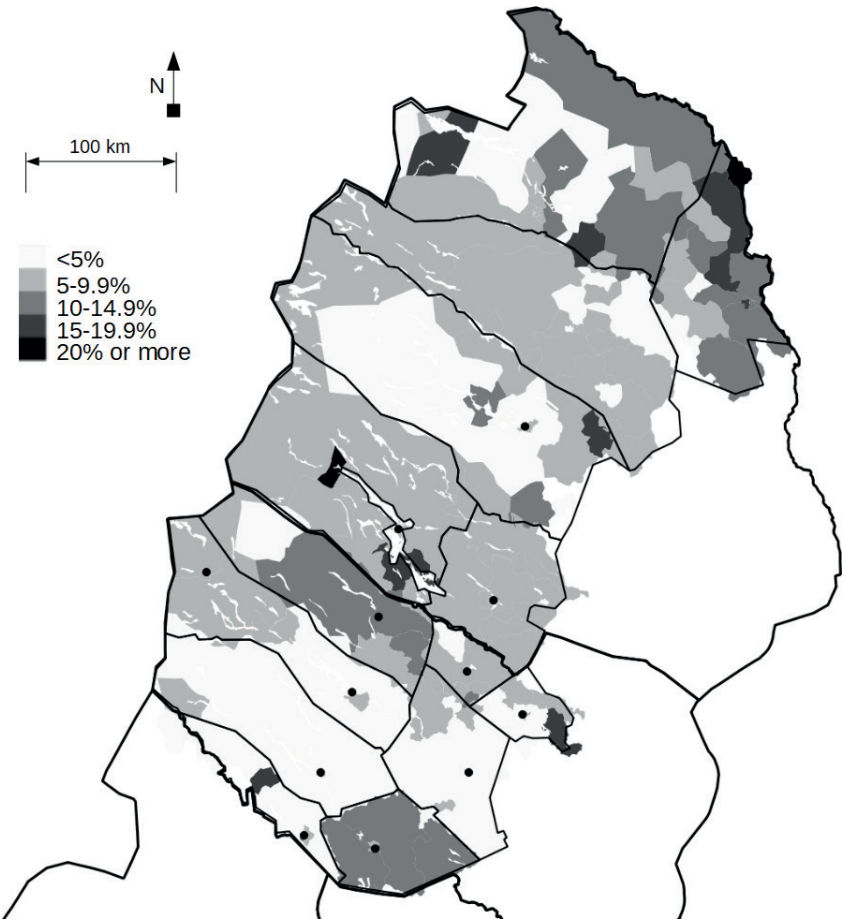

Fig. 3. Proportion of population foreign-born by postcode, 2012.

were absolute increases in the number from Western Europe (270 to 940), Eastern Europe (144 to 855), Africa and the Middle East (255 to 1,528), Asia (327 to 1,450) and all other countries combined (161 to 366). Over 80% of residents born in Africa and the Middle East lived in the municipal centres, along with 71% of those from Asia. There were rural "hotspots" for Asian-born residents in Gällivare and Vilhelmina, but no particular rural hotspots for residents born in Africa or the Middle East.

A high proportion (47%) of Nordic-born residents lived in rural areas in the western parts of the region (primarily Norwegian-born) and the northern parts of the region (primarily Finland-born). There was also a relatively high proportion of Eastern European-born residents in rural areas (40%) and a very high proportion of Western European-born residents in rural areas (62%). Fig. 4 shows postcode areas with substantial over-representation of Western European-born (4a) and Eastern European-born residents (4b). An area was considered to have a "substantial over-representation" if its proportion of people born in those countries were 10% higher than the average (12% of all foreign-born for Western Europe and 10% for Eastern Europe). Hotspots of Western European-born residents were concentrated approximately in Stone's (1962) middle zone, while hotspots of Eastern European-born residents were more sporadically distributed throughout the region.

While overall the foreign-born population was over-represented in the municipal centres, this was largely due to high proportions of foreign-born

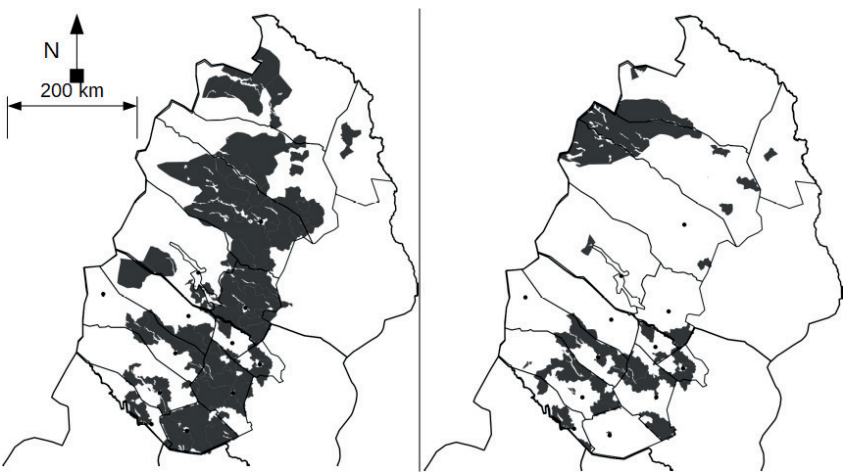

Fig. 4. Postcode areas with over-representation of Western Europe (left) and Eastern Europe born residents, 2012.

in the municipal centres of Sorsele, Dorotea, Vilhelmina, Lycksele and Pajala (Table 4). Other municipalities either had a higher proportion of foreign-born residents in rural areas, or equivalent representation in rural areas and the municipal centre.

Table 4. Proportion of population in municipal centres and rural areas who were foreign-born, 2012.

Municipality	% of municipal centre population foreign-born	% of rural population foreign-born
Norsjö	7%	8%
Malå	6%	7%
Storuman	5%	5%
Sorsele	14%	9%
Dorotea	9%	3%
Vilhelmina	9%	4%
Åsele	7%	12%
Lycksele	9%	4%
Arvidsjaur	6%	8%
Arjeplog	9%	13%
Jokkmokk	9%	8%
Pajala	15%	11%
Gällivare	8%	7%
Kiruna	9%	8%
TOTAL	8%	7%

Local Advance and Retreat in the Twenty-First Century

Fig. 5 shows the average annual in-migration rate (based on 2012 population) by postcode for the period 2001–2012. Rates were generally quite similar in the rural south, ranging from 3–5%, with some areas up to 7% in Arvidsjaur, Åsele and Vilhelmina. Municipal centre rates were typically much higher, including over 10% in Storuman town and Arvidsjaur town. There was more diversity in the north, with rural areas in Gällivare and Kiruna exhibiting both high and low in-migration relating to changes in mining operations and housing of mining workers. Municipal centres again typically had rates of 10% or above.

The very strong correlation between in-migration and out-migration rates at the postcode level (0.9) led to generally high population turnover across the region, with an average annual (2001–2012) volume of migrants in and out equivalent to 16% of the resident population in 2012. Turnover was

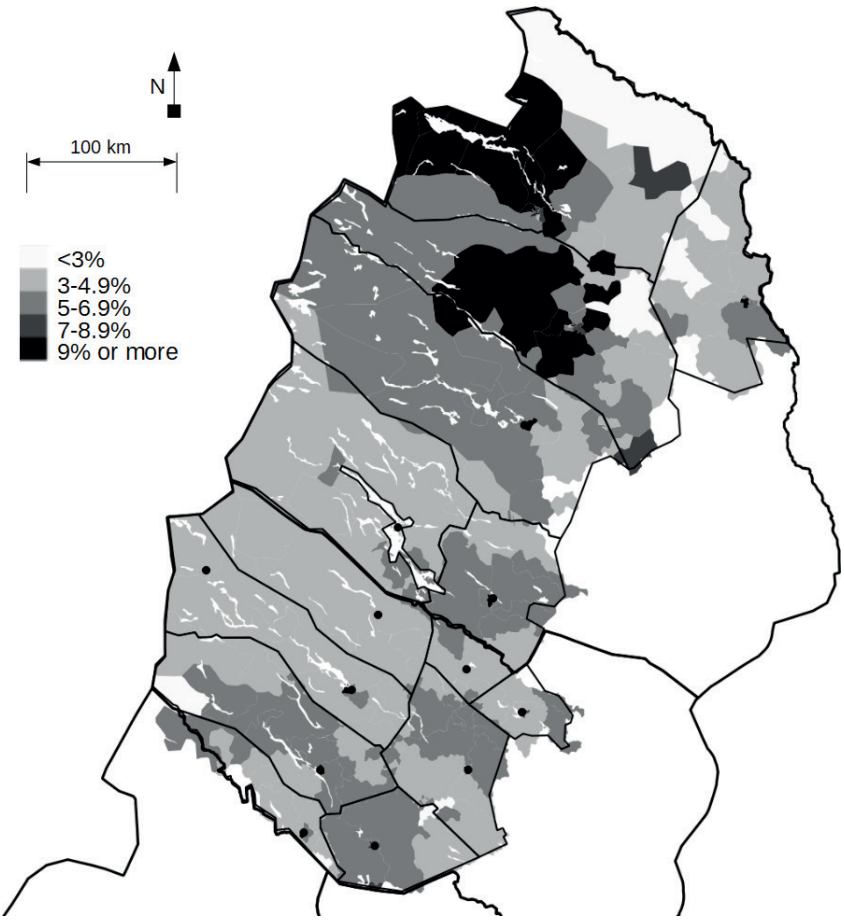

Fig. 5. Average annual in-migration by postcode, 2001–2012.

higher in the far north and generally low in the south west (Fig. 6). Often, areas with low population turnover were located right next to areas with high population turnover, particularly, but not exclusively, in Norrbotten.

Discussion and conclusions

As anticipated at the *Siljan Symposium*, the inland north has experienced a prolonged period of population loss and urbanisation since 1960. "Retreat" has been experienced both regionally and locally, with even the main population centres (the municipal centres) losing population over the period. Only two quite small population centres (Hemavan and Tjautjas) have emerged, with only Hemavan clearly linked to tourism development. Small-

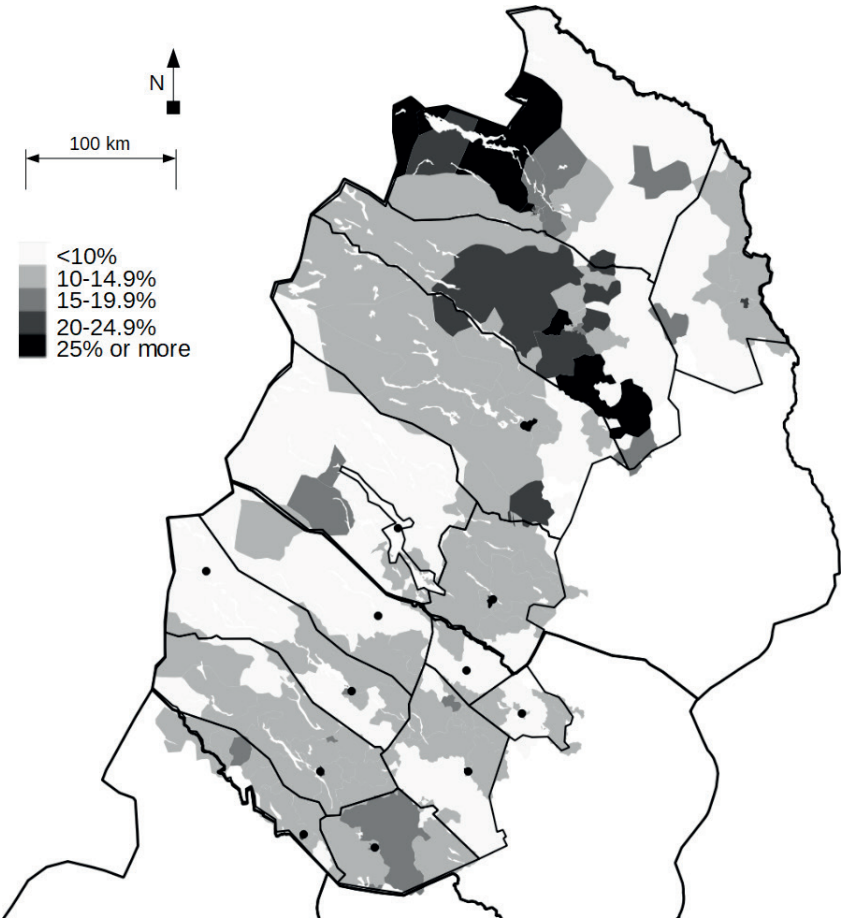

Fig. 6. Average annual population turnover by postcode, 2001–2012.

er villages have generally been more vulnerable to population loss than larger villages and towns, and the municipal centres in Västerbotten in particular have experienced some population growth over the long term. The data reveal substantial differences in experiences of advance and retreat between the north (Norrbotten) and the south (Västerbotten), including higher migration rates and more urbanised foreign-born populations, but less urbanised migrant populations overall in Norrbotten. However, even within these broad regional patterns are diverse local experiences, some of which are time constrained (such as population "booms and busts" associated with mining projects), and some of which may be more entrenched (such as selection of settlement sites for particular foreign-born migrants). The resultant "patchwork" has some resonance with Stone's (1962) fringe

zone classification, particularly highlighting the uniqueness of the middle zone. However, the outer and outer-most zones have had quite different experiences internally, typically along a north-south divide. The outermost zone in particular has been a site of substantial settlement development in the north, but not in the south, despite the focus of tourism development in the southern parts.

The "zones" identified in this research broadly align with Hedlund's (2016) analysis of sites of post-productive (tourism, social services) and extractive (mining, forestry) economic activity. While the extractive sites (in the north) appear to be subject to more dramatic settlement changes over short and long time frames, post-productive (typically in the south and west) activities are equally localised, with a focus on municipal centres and one or two smaller villages. The evidence suggests that post-productive activities, like the succession of natural resource based activities (agriculture, forestry, energy production) noted at the *Siljan Symposium*, are more likely to re-use existing settlements than create new ones, and may be constrained by what are now well entrenched path dependencies relating to transport, infrastructure, and land use planning (as discussed by Müller [2016] in the context of tourism development in northern Sweden).

The data suggest some emerging settlement characteristics which may have long-term implications for the human geography of the north. This includes, at the regional level, a shift towards net positive in-migration during the first part of this century, but also the increasing impacts of different groups of foreign-born migrants. Given that these groups have markedly different preference for different locations (north, south, east, west, rural, urban), the potential for growth in particular groups is a critical factor in anticipating future settlement changes. Since the period primarily covered in this paper (up to 2012), there has been substantial increase in African and Middle Eastern populations (who are predominantly urban dwellers), and also large increases in Western European populations (who favour rural settlement). The extent to which these groups might continue to in-migrate and remain in the north in the context of slowing rates of refugee migration, expected outflow of refugee settlers to the major southern cities, changes in intra-European migration flows (particularly as a result of Brexit), and general "temporariness" expected from European lifestyle migrants (see Eimermann 2017) is unclear.

Internal migration within the region, and return migration is a persistent feature of settlement. Internal migration somewhat favours urban settlement, but at the same time return migration somewhat favours rural settlement, particular among older return migrants. Older return migrants, however, have been a smaller proportion of the return migrant population

than might have been expected, with the large majority of return migrants being in the younger working age groups. A number of these will come and go from the north repeatedly throughout their lives, and may choose different specific locations to live each time they do so.

What is likely is that "all these things" will continue to happen to some degree and at the same time. For every general statement, there are counter examples (even if only one or two), and these counter examples may turn out to be important markers of changes in trends (such as urbanisation or even population loss). The characteristics of dynamism (reflected in simultaneous in- and out-migration), diversity (reflected in the range of populations who engage in that in- and out-migration), and dependence (reflected in the impact that local activities can have on settlement patterns) are clearly present. Factoring these into an estimation of what might happen in the next 60 years requires an understanding of the detail—who, where, when and why—that this paper has begun to explore. Combining the insights of the *Siljan Sympoisum* with the (mostly qualitative) observations of more recent geographic investigations of the north (and similar places around the world) has enabled this research to begin the process. What is needed next is better understandings of how some of the key factors that have been consistently identified over the past 60 years (population demands of different economic activities, sources of in-migrants, impacts of decisions to locate or relocate particular types of infrastructure, movement of people within the region) might evolve in the short- and long-term future, and what prospects they might therefore present for changes in both regional and local advance and retreat. Despite (and along with) a move from natural resource exploitation to services as the main sources of employment in the north, approaches to natural resource management will continue to determine settlement patterns to a large degree. "Traditional" extractive activities like forestry, mining and energy production are likely to continue to require smaller, more specialised and centralised (including to locations outside of the region) labour forces. More contemporary "attractive" activities like tourism and lifestyle migration will likely continue to involve small but widely dispersed populations who are likely to be increasingly transient. As a result, continuing dynamic shifts in who lives in the north, where they live, and how long they stay will be the central characteristic of both advance and retreat.

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REFERENCES

Aldskogius, H. (1960). "Changing land use and settlement development in the Siljan region," *Geografiska Annaler*, 42:4, pp. 250–261.

Almstedt, Å., Brouder, P., Karlsson, S., & Lundmark, L. (2014). "Beyond post-productivism. From rural policy discourse to rural diversity," *European Countryside*, 6:4, pp. 297-306.

Axelsson, P. (2011). "In the National Registry, all people are equal. Sami in Swedish statistical sources," in *Indigenous Peoples and Demography. The Complex Relation between Identity and Statistics*, eds. P. Axelsson & P. Sköld, Oxford & New York: Berghahn Books, pp. 117–133.

Bylund, E. (1960). "Theoretical considerations regarding the distribution of settlement in inner north Sweden," *Geografiska Annaler*, 42:4, pp. 225–231.

Byström, J. & Müller, D.K. (2014). "Tourism labor market impacts of national parks. The case of Swedish Lapland," *Zeitschrift für Wirtschaftsgeographie*, 58:2–3, pp. 115–126.

Carson, D.A., Carson, D.B. & Eimermann, M. (2017). "International winter tourism entrepreneurs in northern Sweden. Understanding migration, lifestyle, and business motivations," *Scandinavian Journal of Hospitality and Tourism*; https://doi.org/10.1080/15022250.2017.1339503; access date 18 March 2019.

Carson, D.B., Carson, D.A., Nordin, G. & Sköld, P. (2016*a*). "Lessons from the Arctic past. The resource cycle, hydro energy development, and the human geography of Jokkmokk, Sweden," *Energy Research & Social Science*, 16, pp. 13–24.

Carson, D.B., Carson, D.A., Porter, R., Ahlin, C.Y., & Sköld, P. (2016*b*). "Decline, adaptation or transformation. New perspectives on demographic change in resource peripheries in Australia and Sweden," *Comparative Population Studies*, 41:3–4; http://dx.doi.org/10.12765/CPoS-2016-11en; access date 18 March 2019.

Carson, D.B., Ensign, P., Rasmussen, R. & Taylor, A. (2011). "Perspectives on 'demography at the edge'," in *Demography at the Edge. Remote Human Populations in Developed Nations*, eds. D.B. Carson, R. Rasmussen, P. Ensign, L. Huskey & A. Taylor, Farnham: Ashgate, pp. 3–20.

Dubois, A. & Carson, D.B. (2017). "The relational geography of post-staples development. A case in Malå, north Sweden," *Journal of Rural and Community Development*, 12:2–3, pp. 23–40.

Eimermann, M. (2017). "Flying Dutchmen? Return reasoning among Dutch lifestyle migrants in rural Sweden," *Mobilities*, 12:1, pp. 116–135.

Enequist, G. (1960*a*). "Preface. Advance and retreat of rural settlement. Papers of the Siljan Symposium at the XIXth International Geographical Congress," *Geografiska Annaler*, 42:4, p. 210.

Enequist, G. (1960*b*). "Advance and retreat of rural settlement in northwestern Sweden," *Geografiska Annaler*, 42:4, pp. 211–220.

Eriksson, G.A. (1960). "Advance and retreat of charcoal iron industry and rural settlement in Bergslagen," *Geografiska Annaler*, 42:4, pp. 267–284.

Hedlund, M. (2016). "Mapping the socioeconomic landscape of rural Sweden. Towards a typology of rural areas," *Regional Studies*, 50:3, pp. 460–474.

Hedlund, M., Carson, D.A., Eimermann, M. & Lundmark, L. (2017). "Repopulating and revitalising rural Sweden? Reexamining immigration as a solution to rural decline," *The Geographical Journal*, 183:4, pp. 400–413.

Johansson, M. (2016). "Young women and rural exodus—Swedish experiences," *Journal of Rural Studies*, 43, pp. 291–300.

Knobblock, E. A., & Pettersson, Ö. (2010). "Restructuring and risk-reduction in mining. Employment implications for northern Sweden," *Fennia-International Journal of Geography*, 188:1, pp. 61-75.

Leu, T. C. (2018). "From Reindeer Herder to Tourist Entrepreneur," diss., Department of Geography and Economic History, Umeå University.

Lindberg, E. (1960). "Seasonal migration of labour from the Siljan area and its economic background," *Geografiska Annaler*, 42:4, pp. 262–266.

Lundholm, E. (2007). "New Motives for Migration? On Interregional Mobility in the Nordic Context," diss., Department of Geography & Economic History, Umeå University.

Lundholm, E. (2012). "Return to where? The geography of elderly return migration in Sweden," *European Urban and Regional Studies*, 22:1, pp. 92–103.

Lundmark, L. (2005). "Economic restructuring into tourism in the Swedish mountain range," *Scandinavian Journal of Hospitality and Tourism*, 5:1, pp. 23–45.

Lundmark, L. (2006). "Mobility, migration and seasonal tourism employment. Evidence from Swedish mountain municipalities," *Scandinavian Journal of Hospitality and Tourism*, 6:3, pp. 197–213.

Lundmark, L. & Marjavaara, R. (2013). "Second home ownership. A blessing for all?," *Scandinavian Journal of Hospitality and Tourism*, 13:4, pp. 281–298.

Montelius, S. (1960). "Finn settlement in central Sweden," *Geografiska Annaler*, 42:4, pp. 285–293.

Moss, L.A.G. (2006). "The amenity migrants. Ecological challenge to contemporary Shangri-La," in *The Amenity Migrants. Seeking and Sustaining Mountains and their Cultures*, ed. L.A.G. Moss, Cambridge, MA: CAB International, pp. 3-25.

Müller, D.K. (2013). "National parks for tourism development in sub-Arctic areas: Curse or blessing?" in *New Issues in Polar Tourism. Communities, Environments, Politics*, eds. D.K. Müller, L. Lundmark & R.H. Lemelin, Dordrecht: Springer Netherlands, pp. 189–203.

Müller, D.K. (2016). "On the location of tourism. An outlook from Europe's northern periphery," in *Naturtourismus. Chancen und Herausforderungen, 47. Jahrestagung des Arbeitskreises für Tourismusforschung in der Deutschen Gesellschaft für Geographie. Zwiesel 25–27 May 2016*, eds. M. Mayer & H. Job, Mannheim: Meta GIS Systems, pp. 113–124.

Müller, D.K. & Brouder, P. (2014). "Dynamic development or destined to decline? The case of Arctic tourism businesses and local labour markets in Jokkmokk, Sweden," in *Tourism Destination Development. Turns and Tactics*, eds. A. Viken & B. Granås, New York: Routledge, pp. 227–244.

Müller, D.K. & Marjavaara, R. (2012). "From second home to primary residence. Migration towards recreational properties in Sweden 1991–2005," *Tijdschrift voor economische en sociale geografie*, 103:1, pp. 53–68.

Müller, D.K. & Pettersson, R. (2006). "Sámi Heritage at the Winter Festival in Jokkmokk, Sweden," *Scandinavian Journal of Hospitality and Tourism*, 6:1, pp. 54–69.

Norling, G. (1960). "Abandonment of rural settlement in Västerbotten Lappmark, North Sweden, 1930–1960," *Geografiska Annaler*, 42:4, pp. 232–243.

Porenius, P. (1960). "Comments on the development of rural regions in Norrland," *Geografiska Annaler*, 42:4, pp. 221–224.

Sköld, P. (2015). "Perpetual adaption? Challenges for the Sami and reindeer husbandry in Sweden," in *The New Arctic*, eds. B. Evengård, J. Nymand Larsen & Ø. Paasche, Cham: Springer, pp. 39–55.

Stone, K.H. (1962). "Swedish fringes of settlement," *Annals of the Association of American Geographers*, 52:4, pp. 373–393.

Tano, S., Pettersson, Ö. & Stjernström, O. (2016). "Labour income effects of the recent 'mining boom' in northern Sweden," *Resources Policy*, 49, pp. 31–40.

Taylor, A. (2016). "Introduction. Settlements at the edge," in *Settlements at the Edge. Remote Human Settlements in Developed Nations*, eds. A. Taylor, D.B. Carson, P.C. Ensign, R. Rasmussen, L. Huskey & G. Saxinger, Cheltenham: Edward Elgar, pp. 3–24.

Vuin, A. (2018). "Migration against the tide. In-migration to lower amenity rural sparsely populated areas in Australia, Sweden and Croatia," diss., Charles Darwin University.

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PEDER ROBERTS

The Promise of Kiruna's Iron Ore in the Swedish Imagination, c. 1901–1915

ABSTRACT Iron ore mining in the Norrbotten region of Sweden began in the early years of the twentieth century as a commercially uncertain and even dangerous proposition. But even before it began to generate profits, public debate began over the appropriate role of the state and of private capital (including foreign investors). This included whether iron ore should be exported for profit or retained for future processing in Sweden—even though the technology and infrastructure for such domestic industry did not exist. Tracing the evolution of this debate in the Swedish news media through to the First World War, this paper argues that the revenue generated by exports became more attractive than the promise of future domestic industry because that revenue could underwrite pressing political objectives. Although domestic iron ore processing remained linked to visions of future industrial prosperity, uncertain visions of future prosperity lost appeal as the capacity for export revenues to generate prosperity in the present became more potent.

KEYWORDS Kiruna, iron ore, economics, Sweden, LKAB, Norrbotten

Introduction

The story of the iron ore deposits in the mountains of Kiirunavaara and Luossavaara is often told as a triumph. During the early modern period the mines and smelters in the Bergslagen region of central Sweden became internationally renowned for the quality of their products. Sami residents were aware of iron ore deposits further north well before they came to the attention of Swedish authorities in the eighteenth century via the Sami informant Amund Amundson Mangi (Ahlström 1966). Although early attempts to extract profits from the ores proved unsuccessful, English capitalists—chief among them the financier Sir Ernest Cassel—invested heavily in mining and infrastructure around Gällivare from the nineteenth century.[1] Despite a series of bankruptcies and dubious financial dealings, by 1902 mining was underway in both the Malmberget and Kiruna regions and railways connected the mines with the harbors of Luleå and Narvik. In 1903 the Swedish company Trafiksällskapet Grängesberg-Oxelösund (TGO) took over the complicated affairs of LKAB and Aktiesällskapet Gellivare Malmfält (AGM) from the controversial wholesaler Gustaf Emil Broms (1849–1903). Ore production boomed, and the promise of the mountains became reality. Kiruna quickly became a thriving town of over ten thousand inhabitants. A 1907 deal with the Swedish state allowed TGO to increase export production and obtain security regarding fees and charges in exchange for the state collecting royalties and freight charges and 50 per cent of the company, with a right to purchase the remaining 50 per cent in the future. LKAB, which became wholly state-owned in 1957, rode out rises and falls in global iron ore prices. Kiruna continued to thrive on the company's back.

This narration celebrates iron ore mining as the lifeblood of Kiruna and its community. Mining created local development in both economic and social terms, defining a pathway that has remained to the present. But the ores of Norrbotten have historically been invested with a range of meanings that enabled them to be enrolled in nationally-based visions of Swedish prosperity and prestige, with Sweden's ascent to the ranks of powerful and civilized nations at least as important as the economic development of upper Norrbotten. My aim in this paper is to examine how the iron ore that lay in the mountains around Kiruna fuelled public debate in early twentieth-century Sweden over exactly how iron ore could (and should) unlock both local and national economic development. Far from determining the path for economic and social development, the commencement of iron ore mining intensified a debate over which of two paths should be taken: one in which iron ore was a source of capital in its own right that attained value through export, and one that privileged a thriving domestic iron and steel

Map 1. Malmfälten—the Norrbotten iron ore fields, and the historical mining region of Bergslagen (inset).

industry based on those ores. The former eventually became more influential than the latter (although both continued to have supporters). Dreams of industrial might based on domestic iron processing gradually shifted toward a more pragmatic acknowledgment that exporting the ore to become steel elsewhere—mainly in Germany—could be regarded as a rational realization of value from a substance within the economic, infrastructural, and technological context of the time.

I have been strongly influenced by Sverker Sörlin's (1987) seminal analysis of Norrland as a "land of the future" in turn-of-the-century Swedish

thought and the work of geographers such as Gavin Bridge (2010) who have emphasized resource-making processes, in addition to Dag Avango's work in linking resource-making with future-making within the context of actor-network theory (Avango 2005; see also Avango, Nilsson & Roberts 2013). Hence, this is not a local story about the birth and adolescence of Kiruna as a community or LKAB as a company. The first managing director of the company, Hjalmar Lundbohm, has been mythologized (and more recently studied critically) as the benevolent founder of a model community (Åström 1965; Persson 2000; Persson 2015). Kiruna has been described and analyzed from a range of both academic and popular perspectives (Johansson i Backe 1977; Brunnström 1981). The economic historian Nils Meinander (1968) wrote a weighty history of TGO that remains indispensable reading over fifty years after its publication (for a longer perspective, see Ahlström 1966). Two commemorative histories of LKAB have appeared (Barck 1990; Myhr 2015), the value of the first somewhat diminished by the claim in the opening of the second that "no collected history [of the company] has ever been done" (Jakobsson in Myhr 2015, loose leaf insert).

What I have instead done is to use newspapers to explore how the ore in the mountains became a resource for politicians, captains of industry, engineers, and professional economists to construct visions of a prosperous and powerful Swedish nation. I have relied heavily upon the fifteen volumes of press cuttings on Norrbotten mining from 1901 to 1916 held at Riksarkivet (The Swedish National Archives) in Arninge within its LKAB collection.[2] The collection cannot be presumed to be comprehensive, and in my judgment there is a bias towards Stockholm newspapers, in addition to a rather artificial starting point of September 1901 (when TGO appears to have begun following Norrbotten mining with a higher level of scrutiny). I am nevertheless satisfied that the cuttings cover the full ideological spectrum and offer an important window into the hopes and fears that were inscribed upon Norrbotten's iron ore. Newspapers constituted a vital forum for public debate in addition to the dissemination of information. Lengthy editorials were common. These could take the form of letters from individual correspondents (often reprinted in full and accompanied by editorial comments), or attacks on rival newspapers that often went back and forth over a number of days, in addition to opinion leaders. A surprisingly complex picture of how Kiruna's iron ore became invested with the ambitions and anxieties of early twentieth-century Sweden emerges from these pages—one that explores how a particular resource was constructed in the context of the political and social relations of a certain time and place, and that demonstrates how a particular understanding of the value of a natural resource became dominant, establishing a consensus that to a large extent persists today.

LKAB. The Broms Years

In September 1901 rumors began to circulate concerning a sale of AGM and LKAB. The history of iron ore mining in Norrbotten had thus far been characterized by bankruptcies, despite the involvement of major financial players such as Knut Agathon Wallenberg, with the first unsuccessful attempt to sell AGM to the state coming already in 1891 (Meinander 1968: 87). The conservative *Norrköpings-Tidningar*'s (hereafter *NT*) vision of "hazy millions" captured a sense that Norrbotten's iron ores had a mirage-like quality that attracted "speculation," contrasted with the solid foundations of enduring ownership for the public good (*NT* 1901). The right-leaning *Nya Dagligt Allehanda* (hereafter *NDA*) emphasized that the future profits from the mines—which might run to billions of crowns—should benefit "Sweden and Swedes" (*NDA* 1901*a*). This did not necessarily mean state ownership or operation: *NDA* and the right-leaning *Aftonbladet* were more worried about foreigners gaining a controlling interest through share purchases, with the latter preferring Swedish businesses and businessmen to foreign capitalists and speculators (*Aftonbladet* 1901*a*). This fear of foreign influence in the Swedish economy was both a cause and a consequence of earlier developments in the mining sector. Economic historian Jan Glete argued that the formation of TGO in 1896 caused a sensation in Swedish financial circles, to the point where it could be said that "the [Stockholm] stock exchange in its modern form came about to organize the trade" of TGO shares (commonly known as *grängesbergare*) (Glete 1987: 13). This included small-time investors as well as established capitalists. Meinander (1968: 108) argued that TGO also marked a new development as it was a Swedish joint-stock company behind which the role of foreign capital in Swedish iron ore mining could be obscured.

Now that the mines were in operation and the railway lines connecting Kiruna and Gällivare with export harbors either completed or nearly completed, the financial insecurity of LKAB and AGM became a more serious threat given its potential to derail a development of significant value to the nation. The conservative *Stockholms Dagblad* (hereafter *StD*) claimed in October 1901 that the existing restrictions on foreign share ownership in LKAB, due to its contract with the state over building the Gällivare–Riksgränsen rail line, did not prevent AGM being subject to a foreign takeover that would then control LKAB through the former's dominant share in the latter (*StD* 1901). The state thus emerged as a safer alternative to private ownership. A state purchase of the mine could be costly, and *Aftonbladet* wondered whether the opaque financial arrangements of the companies precluded the state from being able to adequately appraise what it was buying (*Aftonbladet* 1902). By the end of the year the scandals included a libel

action by Wallenberg against Harald Sohlman, editor of *Aftonbladet*, who had aggressively reported on Wallenberg's earlier dealings with AGM (Wetterberg 2013: 61). But *StD* felt that "some sacrifice" was warranted to prevent the Norrbotten iron ore fields falling into foreign hands, particularly with reports that German interests were following the situation closely, although they too had reservations about becoming involved (*StD* 1901).

Despite an injection of short-term financing in December 1901, the liberal-leaning *Stockholms-Tidningen* (hereafter *ST*) thought it a certainty that state intervention would come up in the following year's session of the national parliament (*ST* 1901*a*). *Aftonbladet* (1901*b*) had declared that the problem of how to arrange a state purchase was "not altogether insoluble." But on 31 January 1902 multiple reports emerged that the purchase would likely not be presented to the parliament and hence would not go ahead. Opinions were divided on whether this was a good thing, with the admitted risk of a purchase highlighted by *Aftonbladet* (1902) while *NDA* (1902*a*) regarded that risk as necessary to ensure that the iron fields were safely held in state hands.

All sides agreed that if the ore fields were to be developed capital would have to be sought either from the Swedish state or from abroad. *NDA* felt that the mines were of sufficient economic importance to make them essential to "the general economic future of the homeland [*fosterlandet*]," and blamed Broms for exposing them to foreign danger by attempting to sell his interests to foreign investors (*NDA* 1902*b*). Others were less willing to conflate foreign capital with foreign control. Notably, in December 1901 *ST* (1901*b*) had argued that foreign capital was so important for the development of the Norrbotten mines that it was unpatriotic to spread rumors abroad that could hinder investment. The liberal *Svenska Dagbladet* (hereafter *SvD*) claimed in August 1902 that Norrbotten was particularly dependent upon foreign investment for economic growth and hence disproportionately affected by the uncertain investment climate that the government had created through its inaction (*SvD* 1902*a*). *Norrbottens-Kuriren* (hereafter *NK*) argued in December 1902 that foreign capital had greatly benefited development in Sweden, even if it agreed that in an ideal situation, domestic industry would grow under its own steam (*NK* 1902*b*). The newspaper had earlier endorsed plans for an ore processing facility at Karlsvik, Luleå, in July 1902 on the grounds that "new blood" was needed to stimulate industry and employment (*NK* 1902*a*). The businessman behind the project, William Olsson, dismissed concerns about foreign investment and instead pointed to the need for development as decisive (*SvD* 1902*b*).

By February 1903 rumors appeared frequently about TGO intervening in Broms's distressed financial affairs, and a deal was soon presented to par-

liament. TGO would get preferential traffic rights on the Ofoten line and a commitment to allow 1.5 million tons of iron ore to be exported through it (up from 1.2 million), in addition to a loan of 20 million Swedish crowns, the end of a long-running court case between the state and AGM over ownership of the Gällivare fields, and a commitment that the company would be compensated for any export duties through reduced freight fees. In exchange the state would have a representative on the company's board, the right to purchase shares at par if TGO chose to sell them, and the comfort of knowing that the Norrbotten mines were in Swedish hands. Such was the political power of this final factor that the loan could be justified as a means of preventing TGO from being forced to seek foreign investment (Meinander 1968: 112). Reaction from the press was mixed. The populist *Vårt Land* (hereafter *VL*) worried that increased extraction would mean the ore body was emptied earlier without corresponding benefit to domestic Swedish industry (*VL* 1903*a*). This was a strong articulation of a conception of iron ore that would prove durable throughout the decade—as a fixed store of value to be released through the process of industry. *StD* argued that having the mines in Swedish hands was the most important thing, and hoped that the government would do what was necessary to ensure it was secured (*StD* 1903). But the liberal *Dagens Nyheter* (hereafter *DN*) argued that Broms had played upon fears of foreign ownership to extract a favorable deal from the state and that TGO had been happy to thereby grab a powerful market position. The conservative-leaning prime minister Erik Gustaf Boström lost the vote convincingly amidst continued debate about whether TGO's ownership could really be considered an effective guarantee against foreign interventions, and rising concerns about whether the exports would remove the raw material for a domestic iron processing industry. Shortly afterwards TGO took over Broms's shares anyway, pleasing those for whom it was a shield defending Swedish interests.

Exports versus Domestic Processing

Why did domestic industry assume such a large role in public debates? Gerard De Geer wrote in 1961 of the iron industry in Bergslagen as "a powerful lever for economic and political advancement" during the early modern period (De Geer 1961: 19). De Geer argued that Swedish iron attained its status partly through ready access to wood for fuel, but also through a centralized administrative structure that prevented uncontrolled mining and processing (De Geer 1961: 22–23). Visions of a thriving future domestic iron industry thus required political will in addition to natural resources—and in the case of Kiruna, also the development of new technological processes.

Unlike ores from Bergslagen or Gällivare, most Kiruna ores were comparatively rich in phosphorus, and hence incompatible with existing industrial facilities in central Sweden. In 1879 the Englishman Sidney Thomas developed a process for working high-phosphorus content iron ore that rapidly came to dominate steelmaking in the Ruhr Valley, where rich coalfields could now make use of the phosphorus-rich ores from the nearby Lorraine, annexed to Germany following the Franco-Prussian War of 1870–1871 (Lynch 2002: 270–271). Boosters of Swedish domestic processing relied on faith that new technological advances would be able to replace coal (which Sweden lacked) with electricity from hydropower (which potentially existed in great quantities in Norrbotten), thus making the Thomas process viable in Swedish conditions. This meant invoking a promise of technological innovation that had not yet come to pass, but which appeared tantalizing given the potential of northern rivers. Faith in technology thus combined with nostalgia for a past golden age to make a new era of prosperity based on domestic iron ore processing seem both tangible and logical.

This historical legacy was complemented by an emerging sense that industrialization had made iron processing the most important index of national strength. Powerful nations processed iron ore; weaker nations exported it. Here the growth of the Ruhr industrial complex and its seemingly insatiable appetite for iron ore became a symbol of German strength—and by extension Swedish weakness. Whether that national strength would necessarily translate to local or regional development was another matter. At the height of debate over the proposed TGO deal in May 1903 the liberal-leaning *Svenska Morgonbladet* (hereafter *SvM*) argued that state intervention in the mines was necessary not only for their value to the national economy, but for their potential to drive Norrbotten's cultural development (*SvM* 1903). On the other hand, argued an unnamed expert in *VL* (1903*b*), that potential would be lost if the ore were exported without being processed domestically, leaving Norrbotten as a squeezed lemon that would "make us worthy of the fate of Finland" (then part of the Russian Empire). If Germany was the paradigmatic example of how iron had made a modern powerhouse, the cautionary example was Spain. *Värmlands Dagblad*, which covered part of the historical Bergslagen region, was a frequent voice in favor of domestic processing and argued that the region around Bilbao had little to show for its many years of mining as the ores began to run out. Would the same happen in Norrland, thus denying the possibility of a "whole culture" coming into bloom (*Värmlands Dagblad* 1903)? *ST* (1903) captured the essence of the matter by claiming that the iron ore in Kiruna was "a resource for our land's development and for Norrbotten's culture." Domestic iron ore processing thus added value in both financial and cultural terms.

As the TGO takeover alleviated immediate fears of foreign ownership of the ore fields, media attention turned to domestic processing of iron ore as both a means of maximizing economic gain and a symbol of Sweden's status as an industrial nation rather than a resource exporter. Export duties on iron ore had been raised as a means of protecting domestic industry as early as February 1902 (*NDA* 1902*b*; *DN* 1902). Were more of the ore to remain in Sweden the nation's dependence upon imports of certain iron products would be reduced, and Norrbotten's development would be stimulated, argued William Olsson (1903) in *NDA*. Besides, a foreign buyer would lack the patriotic commitment to creating Swedish industry. But while protectionism had many supporters, so too did more liberal economic ideologies whose advocates characterized restraints on trade as outdated. In May 1903 *SvD* criticized the arch-protectionist Per Emil Lithander, who argued strongly for export duties on Kiruna ores, and claimed that the parliament too often allowed itself to be guided by outdated economic principles, or acted without principles at all (*SvD* 1903).

The criticism of Lithander is striking for its foregrounding of economic ideas—and ideas about Sweden's future economy—as the relevant battleground. This was a feature of debates over the Kiruna ores through the early twentieth century. Alfred Elis Törnebohm, head of the Swedish Geological Survey, reduced the prospects of a Norrbotten iron processing industry to a factor of the accessibility of coal and iron. Without readily accessible coal reserves, Kiruna would never become a center for iron production. Törnebohm also observed that about 80 per cent of ores from Kiruna and Luossavaara were exported to Germany, where the implementation of the Thomas process had created a thriving technological system oriented toward precisely the kind of ore that Norrbotten produced (*DN* 1905). A system existed through which ores could be turned into capital through export to a market that through its structural features, was likely to remain both stable and hungry for some time to come.

Törnebohm's optimistic view of the total reserves (793 million tons in Kiruna and Luossavaara) was quickly contested by Hjalmar Sjögren, curator of mineralogy at the Museum of Natural History in Stockholm, who put the figure at closer to 300 million tons. This in turn allowed him to argue that the threat to domestic industry was greater, as the percentage of total ore lost to future domestic industry through present exports was higher. Sjögren held that because iron processing was such a powerful index of national strength, ore exports were a zero-sum transfer of power that gave Sweden's future away, irrespective of the present availability of coal (*StD* 1905*a*). A subsequent pamphlet repeated his claims and equated the present situation to not having a plan for "the housekeeping of the country's pantry"

(*Göteborgs Aftonblad* 1905*a*). The two men continued to argue. Törnebohm stuck to his original estimates but found common ground with Sjögren on one point: even if Sweden's reserves were greater than he believed, that did not mean they could be "wasted" through excessive exports, suggesting that Törnebohm remained unwilling to entirely abandon dreams of an industrial future for the Kiruna region (Törnebohm 1905).

The frequent calls for export duties in 1905 were linked also to the profits that TGO was starting to make and to broader debates over the merits of free-market capitalism. *StD* (1905*b*) agreed that export duties could be justified in some circumstances, but failed to see a rationale behind the calls, beyond concern that TGO was making a fortune. Those profits were precisely what led *Göteborgs Handels- och Sjöfartstidning* (*1905a;* hereafter *GHST*) to suspect that TGO was set to be punished for excessive success. On the other hand, the party organ *Social-Demokraten* (hereafter *SDk*) felt that it was a simple question of economic justice. The state had a right to the profits, as the money flowing from Norrbotten ought to go to the Swedish people and not simply the pockets of capitalists (*SDk* 1905*a*). The business-oriented *Stockholms Handelstidning* (1905) refuted this claim by asserting that the iron could not be converted into wealth except through exports, and thought it odd that Social Democrat leader Hjalmar Branting (whose byline appeared below many articles on the iron ore question) should want to deny workers their bread. As a parliamentary vote on the question neared, the Norrbotten Chamber of Commerce issued a statement urging the rejection of export duties and pointing to the local economic benefits that the mines had brought (*Nordsvenska Dagbladet* 1905). *SDk* (1905*b*) reported the visit of a workers delegation from TGO who feared the impact of duties on their livelihoods (although the newspaper continued to be scathing in its attitude to the company and its profits). When the parliament rejected the proposal by a surprisingly decisive margin, newspapers which had pushed for duties depicted the vote as a "scandal" that would ensure the nation's wealth was shoveled into the hands of capitalists and foreigners (*Fäderneslandet* 1905; *Göteborgs Aftonblad* 1905*b*).

The export duties question reemerged in early 1906 when the Swedish-German trade treaty came up for renegotiation. *DN* claimed in March 1906 that there were by now two clearly identifiable schools of thought on the iron ore question: a protectionist view that wanted ore exports stopped altogether, believing that the value of iron ore could (and should) only be unlocked through its processing; and a more liberal view that regarded the cash from exports as the best means of extracting value from the iron ore as long as there was no domestic industry to take advantage of it (*DN* 1906*a*). Amidst claims that the threat of German reprisals was overblown, given the

extent of Germany's dependence on ore imports from Sweden, a broader point emerged concerning the wisdom of removing an instrument of policy through a pledge to not impose export duties. This again related to national pride in addition to economics. *Stockholms-Bladet* (1906) saw it as symptomatic of a willingness to accept humiliations, and *SDk* (1906*a*) regarded it as symbolically important in showing that the Swedish state would not rely on big capital to ensure the welfare of its workers. After much debate a treaty was agreed that precluded export duties while ensuring that the Swedish state held control over the total *amount* of ore exported through the Ofoten line, using this as an alternative means of controlling the flow of iron ore exports.

The role of export duties and freight privileges in the treaty negotiations again affirmed that despite claims to the contrary, instruments of economic policy could never be regarded as apolitical. When *SvD* (1906*a*) argued that the iron ore question was of "essentially a technical character"—and therefore a simple function of whether domestic processing was feasible or not—it vainly attempted to eliminate "political feelings" from an inherently political debate. From a protectionist perspective sacrificing the right to levy export duties constituted a voluntary renouncement of the path to national greatness, which lay through domestic processing, rather than an expedient way of earning income in the absence of the structural conditions for domestic industry. Such a view located Kiruna's ores within a political and technological system that privileged domestic iron processing as the supreme goal of a modern state, thanks to the presumed link between steel and national strength. Even the right to private property could be legitimately overridden if it meant the stimulation of domestic industry, argued *Stockholms-Bladet* (1906*a*). Instead of exporting ore because there was no domestic industry to process it, Sweden should put all its efforts towards the technological advancement that would make electrical processing based on hydropower viable (see for instance *SDk* 1906*b*). *Skånska Aftonbladet* (1906) quoted the Swedish consul in Hamburg as claiming that "ore exports do not befit a civilized nation" in March 1906 as part of a broader attack on laissez-faire economics. A new day was dawning in which the state drove economic development in close concert with the natural sciences.

Because the promise of electrically-driven ore processing proved a powerful resource for opponents of exports, liberal advocates of exports increasingly emphasized arguments that de-privileged the unique position of domestic industry to extract value from iron ore. In February 1906 the journalist and inventor Hjalmar Cassel (no relation to Sir Ernest) argued that natural resources only possessed value when circumstances made them useful, thus denying any natural law dictating that domestic processing was

always the optimal use of the ore. He bluntly reduced the whole question to "Can we make steel cheaply enough to compete on the world market?" (H. Cassel 1906*a*). If electricity proved a viable substitute for coal in large-scale processing, then Sweden would get a booming domestic industry, but not necessarily concentrated in Norrbotten. Instead he proposed concentration in existing centres as a wise strategy for a demographically small country (H. Cassel 1906*b*). This in turn rested on a railway linking the north to the south and center of the country, the "inland line" project. If cheap coal could be imported to the west coast of Sweden, a line from the north bearing iron ore could meet it at a point further south (*StB* 1906*c*). Even then the phosphorus-rich composition of most Kiruna ores meant they could not be used within existing Swedish plants (the only exception being the so-called "A-grade" ores). This distinction gained power in early 1906 as part of a new position that distinguished between ores that could not be processed within existing industrial structures—but which could be converted into capital through export—and ores that could be processed domestically (*DN* 1906*b*). Shifting the field of debate from whether exports were *ever* an appropriate use of ores to the circumstances under which they could be exported marked an important departure. Domestic industry and exports were now placed upon a continuum rather than as exclusionary positions.

In May 1906 a new deal was negotiated between TGO and the state. The state would obtain half the shares in LKAB with an option to purchase the remainder after 25 years or take them over after 50, along with the right to restrict exports of ore that could be processed within Sweden. TGO would get certainty over freight rates for up to fifty years and an end to the legal cloud that still hung over its Gällivare operations. The deal was structured so that four-fifths of the estimated ore reserves in Kiruna would remain at the end of the fifty years, along with two-thirds of those in Gällivare. Opinions were predictably divided, but the differences were now of degree as much as kind. *SDk* (1906*c*) felt the deal was weighted in favor of TGO due to the long time period, while *VL* (1906*a*) worried about whether the capital earned through exports would be invested in domestic processing. Even organs such as *GHST* that could hardly be considered protectionist seemed comfortable with state control as a hedge against foreign interests, and the newspaper judged the bill's ultimate narrow rejection more as an invitation to present a revised bill than a repudiation of the deal altogether (*GHST* 1906).

In the wake of the 1906 rejection *GA* (1906) felt that the iron ore question was becoming sufficiently complex that the voices of experts were needed—but lamented that such experts tended not to write newspaper articles. That statement would soon be disproven. Most notably, the econ-

omist Gustav Cassel, professor at Stockholm University and brother of Hjalmar, turned his attention to the Norrbotten iron ore fields from 1906 onwards. In his first major intervention, Cassel (1906*a*) echoed his brother's position with a more academic economic framing. Ore must be treated as a commodity capable of bringing in capital through exports and thus stimulating the domestic economy, rather than the stimulation necessarily occurring through the domestic processing of the ore (which could only be established through the application of capital). Furthermore, compound interest would accrue on capital but not on the ores themselves as long as they remained in the ground. The greatest barrier to Sweden staying in touch with other modern countries was not lack of domestic industry, but rather the "woefully" low level of technical and economic expertise that the parliament applied to the iron ore question and the low level of public awareness of economic principles. Soon afterwards Gustav Cassel (1906*b*) introduced a new argument: turning the ore into capital through exports would allow for more spending on national defence, whereas leaving it in the ground presented a prize for an invading power.

Gustav Cassel's argument about capital for domestic processing accorded with an increasing consensus that exports were a means through which domestic industry could be advanced rather than being its zero-sum antithesis, provided the technology and logistical infrastructure were in place (see for instance *NDA* 1906). The pejorative term *rofbrytning* (extraction prefaced by a word describing robbery) had by now become common on both the social democratic left and protectionist right, particularly when linked to the profits of TGO (*SDk* 1906*d*, *VL* 1906*b*, *SDk* 1906*e*). This was a further sign that the debate was becoming more about *how much* rather than *whether* to export, and who should benefit. Opinions such as the protectionist critique in *Skaraborgs Läns Tidning* (1906*a*), which crudely claimed that natural resource exports were placing Sweden on a par with the world's "half-civilized" countries, were now noticeably away from the mainstream.[3]

By early October a distinct sense can be discerned in the newspaper landscape that serious investigation of domestic processing combined with continued exports was desirable, with TGO as at worst a necessary evil. The opening of a small electrical ironworks at Karlsvik added to the sense that domestic industry was a realistic if as yet not fully realized possibility (*ST* 1906). That consensus appeared again when the Swedish newspapers unanimously criticized the German *Kölnische-Zeitung*'s complaint that by restricting exports the Swedish government was violating the terms of the trade treaty, an argument that the German government also quickly disavowed (for a particularly good example see *DN* 1906*c*). The consensus soon faded, however, as more identifiably ideological divisions over the role of

private industry and the rights of the state to intervene reemerged (*SvD* 1906*b*, *Aftonbladet* 1906, *Vårt Land* 1906*c*). This now included more frequent analogies to forestry management—including the landmark 1903 law that categorized forests as renewable but finite resources (Nyland 2009)—a theme that until now had largely remained separate from the iron ore question. Excess timber could be turned into charcoal and used to fuel iron ore processing, transported by railways that functioned as arteries for new cultural and economic life rather than funnels for exports (*SvD* 1906*c*). Reports from Karlsvik were also encouraging. By December 1906 it was claimed to be producing 40 tons of pig iron a day from Malmberget ores (*SvD* 1906*d*).

Such was the renewed interest in the ore question that from December 1906 *GHST* ran a series of commentaries from leading figures in politics, industry, and science on the matter. Most contributors were open to state oversight or ownership, and to exports at present or greater levels. The conservative parliamentarian Rudolf Kjellén argued that the state ought to buy the iron ore fields in a straight transaction and then use export revenues to finance the new inland line. In this manner exports would open up Norrbotten for development and facilitate Sweden's dreamed-of industrial age (Kjellén 1906). The impact of the mines on the community of Kiruna was such that removing its lifeblood of exports in favor of an uncertain industrial future constituted an unacceptable risk, claimed the Liberal Georg Kronlund (1907). Even the arch-protectionist Per Emil Lithander (1907) now accepted the value of exports, while remaining insistent that the state not relinquish its right to control freight rates or levy export duties (the latter being a subject almost no one else still considered relevant). Summarizing the fifty-four responses, *GHST* saw the key question as being how the ore fields could benefit the nation and its economic life, with state ownership favored by a majority—though certainly not all—and an agreement with TGO almost unanimously considered to be essential (*GHST* 1907*a*).

The Grand Bargain of 1907 and its Aftermath

In late March 1907 the framework of a new deal became public. The state would be part owner of LKAB (into which a number of mines would be incorporated), with a shorter period to potential full control over the company (25 or 35 years), and formal guarantees that usable ore would be reserved for domestic industry. The deal met wide approval. *SvD* (1907*a*) argued that it paid appropriate attention to the national economic dimension—supporting a strong domestic industry—without getting sidetracked by the state financial dimension (raising revenue through duties and charges). *Helsingborgs-Posten* (1907) noted a drift away from extreme positions of state socialism and private ownership: as the *GHST* articles had demonstrated, it was

possible to at once want the reassuring hand of the state on a key national resource and to reward the patriotic and brave risk that TGO had taken in assuming control of an uncertain proposition and turning it into a financial success. Even *SDk* (1907*a*) expressed positivity, its main concern being the exact price the state would have to pay. The railway engineer and upper chamber parliamentarian Claes Adelsköld (1907) published a 139-page pamphlet arguing for stronger state control based on a more pessimistic assessment of the Kiruna reserves, which *NDA* felt barely worth discussing due to its obviously poor prospects for success, although it almost condescendingly noted that the author's "patriotism is undoubtedly burning and true" (*NDA* 1907*a*). More attention went to William Olsson, who decried the deal as a socialist confiscation in a letter to *DN* (Olsson 1907), but the editorial comment beneath his letter was scathing. Even more conservative organs like *NDA* (1907*b*) regarded Olsson's intervention as at best unhelpful.

Did the debate and subsequent decision bear out Gustav Cassel's insistence (1907) that the ore question was one for economics, based on prudent and rational analysis rather than a particular article of ideological faith? The final vote certainly confused ideological boundaries, with *GHST* (1907*b*) noting a number of odd bedfellows, including the conservatives Kjellén and Ernst Lindblad making common cause with the Social Democrat Branting. Lindblad echoed Prime Minister Arvid Lindman in saying that the vote had indeed been about concluding a business transaction rather than debating state socialism or liberal economic theories (*GHST* 1907*b*). A correspondent with the pseudonym "Impartial" similarly insisted that the iron ore question ought to be considered on business principles (Opartisk 1907).

Attention now turned to what the state ought to do with its projected windfall. *SDk* (1907*b*) predictably warned against it ending up in the pockets of "capitalists and profiteers." The astronomer and popular science writer Nils V.E. Nordenmark—who not coincidentally also worked in the insurance industry—argued in *SvD* that a national social insurance scheme along Bismarckian lines would best ensure industrial growth (Nordenmark 1907). There was little enthusiasm for the inland line, which was increasingly discussed in cost-benefit terms within the context of existing transport arteries (see for instance *NDA* 1907*c*). Hjalmar Cassel was particularly critical, regarding the general idea as sound (and patriotic) but arguing that its advocates were blindly keen to start work in defiance of obvious geographical difficulties with the route and an almost complete lack of economic analysis of its prospects. A serious and "impartial" investigation was needed (H. Cassel 1907). *SvD* (1907*c*) worried about over-reliance on the harbor at Narvik, though it could see no firm reason why Norway would create difficulties. Others were less certain. *VL* (1907) cautioned against any deal without an

assurance from Norway that it would not interfere. The language of expertise, impartiality, and rationality also suffused an editorial in *SvD* (1907*d*) on the need to assess the nation's mineral stocks, another prerequisite for informed decision-making.

There was also continued interest in how the state should support domestic iron processing, and the extent to which exports were a means to this ultimately superior end. Voices such as *VL*'s continued to use the term *rofbruk* to describe exports that did not generate capital benefiting domestic industry. In a February 1908 editorial the newspaper glorified the role of the German and Japanese states in actively making the future through industry rather than sitting back and waiting for events to unfold, positioning them as the vanguard of a new way of economic thinking that held the keys to future power (*VL* 1908). This resonated with a wider sentiment that equated industrial development to power and civilization, and in which the failure of Spain to develop a significant domestic industry on the back of its iron ore exports could be considered a frightening cautionary tale (see for instance *NDA* 1908). On the other hand Hjalmar Cassel (1908) pointed to the Dunderland Valley of northern Norway, where a promising iron ore field had turned into a fiasco thanks to the ore not being amenable to processing through the Edison separation method. By late August 1908 *SvD* could dissect the "tragedy" of Dunderland as an example of how even a prospect started in the most auspicious circumstances, with the world's best inventors and specialists on hand, and plenty of capital, could still fail (*SvD* 1908).

Yet the link between domestic processing and national strength remained strong. In early 1909 Hjalmar Cassel noted that a visiting Canadian expert thought electrical processing would be the greatest breakthrough since the Bessemer process, leading some countries to ascend from their perch in the hierarchy of iron powers and others to fall as the value of ores shifted accordingly, though he again warned that the technology's development remained the decisive factor (H. Cassel 1909). Twelve months later, after economic strife that included a month-long general strike and subsequent further industrial action in Kiruna, *StD* (1910) continued to place great faith in hydropower developments in Norrland producing electricity that could drive iron ore processing and lead to great developments in national-economic perspective.

As the clouds of war gathered over Europe the ore in Norrbotten's mountains became inscribed with a new set of fears. *NT* (1911) suspected that German concerns about the reliability of Swedish iron ore supplies were a factor in the Agadir Crisis, and when the crisis was resolved *Göteborgs Morgonpost* (1911) attributed the negative German press response to Germany's not gaining access to Moroccan iron ore reserves. In addition to

their importance in the eyes of foreign powers, the Norrbotten mines possessed significance within the growing clamor for rearmament, symbolized by the public campaigns to build new F-class destroyers (popularly known as F-boats). In February 1912 Gustav Cassel argued that the security of the state owning the Norrbotten iron ore fields would be worthless if it could not defend them, and that revenue from iron ore exports could provide all the money needed for Sweden to build up its national defence (G. Cassel 1912*a*). Eli Heckscher, the liberal economist whose earlier study had questioned the link between railways and development in Norrland (Heckscher 1907), agreed enthusiastically and pointed to the example of Falun's copper deposits financing the Thirty Years' War (Heckscher 1912). At the same time Fredrik Svenonius, a geologist rather than an economist and an avowed believer in the industrial flowering of Norrland, pointed to Morocco's fate and linked it to its status as a resource exporter (although he still accepted that some exports were allowable, provided they were regulated in proportion to domestic production) (Svenonius 1912). The greatest threat to Sweden's independence came from the unpatriotic sacrifice of its industrial future.

The renewed importance of the mines within a defence context prompted *SvD* to ask a series of experts whether iron ore exports should be increased (and if so, to what ends that money should be put), along with how exports could most usefully benefit Swedish shipping. The results were almost unanimous in desiring greater exports, but differed when it came to expenditure. Forestry, hydropower, railways, paying off the national debt, and stimulating domestic ironworks were all mentioned in addition to defence. Olof Bergqvist, consecrated in 1904 as the first Bishop of Luleå, was one of the few voices of caution. His argument that production should be kept at a moderate level in order to extend the life of the mine was predicated not on maximizing the value of the capital tied up in the ores—the Cassel-Heckscher position—or even the need to preserve ores for future industry, but rather on the value of Kiruna persisting as a viable community (Bergqvist 1912). One might fairly wonder whether *SvD*'s experts were a representative sample of opinion, given the dissenting voices that appeared in other forums. *Vänsterman* ['Man of the Left'], writing in *DN*, failed to see how warships would protect the inland Kiruna fields, and noted that defence speculation had the wearily inevitable effect of raising the price of TGO shares. Export of natural resources was analogous to emigration—another grave concern at the time—as it removed the basis for future productive labor (Vänsterman 1912). *SDk* (1912) similarly warned against raising exports to fulfill particular pet projects, be they F-boats or hydropower.

One of the consequences of this debate was to focus attention on the claims to authority made by the academic economists, principally Gustav

Cassel. In the wake of criticism from newspapers including *NDA* and *DN* Cassel denied that opposition to increased exports from Norrbotten was tied to a particular party position, instead attributing it to a pervasive petit-bourgeois sentiment that infected all parties to some degree. Increased exports were an obviously good idea that the Swedish people ought to accept as a necessity, and the government's calls for more defence spending ought to be met by the resources to hand. He further suggested that it was a strange kind of democracy that refused to alleviate its own burdens in order to possibly benefit generations several hundred years in the future (G. Cassel 1912*b*). Cassel's insistence that his position was objectively true must be considered a rhetorical device, no more a product of his professional training than the geologist Arvid Högbom's insistence that the Kiruna ores should be extracted as quickly as possible to prevent their seizure by a resource-hungry Great Power (Högbom 1912). The patronizing tone would be unlikely to appeal to modern readers. But it accords with the role he adopted as a popularizer and advocate of economic theory, which earned him the title "tutor of the people" from his colleague Sven Brisman (Magnusson 2006: 95).

In a sense Cassel's preaching was also unnecessary, because much of his audience was already converted. A set of opinions solicited by *Aftonbladet* in February and March 1913 once again produced consensus that exports should be raised. In its summary the newspaper observed a growing sense that the restriction of iron ore exports while the national debt grew was clearly a bad idea in national economic terms. Iron ore was equated more to capital than to steel. An editorial in *Östgöten* (1913) plainly stated that with the future looking uncertain (in terms of both the Swedish economy and the international political scene), it made sense to look to the ore fields to fund needed developments within Sweden.

In April 1913 the Liberal government of Karl Staaff placed a motion before parliament to fund a new pension system through increased export revenues. Amid positive coverage from across the spectrum of newspapers, only a few complaints were raised as the motion passed with ease. The philologist and conservative parliamentarian Vilhelm Lundström (1913) argued in *NT* that the public finances were now hopelessly entwined with the future profits of the iron ore fields, which lay in a difficult-to-defend borderland. Lundström's complaint reflected a deeper political difference with the Staaff government over defence spending—Lundström wanted more, Staaff notoriously was ambivalent—and ultimately Staaff's government resigned in February 1914 after a march on Stockholm demanding greater investment in national defence (Lindblad 2015). But the exports continued. They had clearly become the dominant vehicle through which political goals could be attained.

By and large, the Swedish public had learned to love iron ore exports. As estimates of the Kiruna reserves grew and the near-term likelihood of processing based on hydropower remained at best unclear, the visceral objection to exports based on equating ironworks to progress faded, and the capital that flowed in as the ore flowed out from Narvik and Luleå became a resource for visions of increased government spending. Iron remained a symbol of industrial power, and its processing remained an enticing dream, but the capital it brought to Sweden was increasingly recognized as a source of wealth that could not be ignored.

Conclusions

To celebrate its hundredth birthday, LKAB commissioned a history that appeared in 1990 under the unimaginative title *LKAB 100 år* ['LKAB 100 years']—but with the rather more illuminating words "100 years for Sweden" at the top of the front cover. The implication is that the Norrbotten mining giant, fully state-owned since 1957, has strived throughout its history to contribute to the greater national good. The company is (and has been) an engine for the betterment of Sweden. Ultimately this came through exports. A large hydropower facility at Porjus was indeed built, not much more than 100 kilometres from Kiruna, but the ironworks built in its footprint never met with great success, even though the power it produced was important for allowing LKAB to expand extraction activities (Hansson 1994).

At a time when the conflation of national strength with heavy industry remains a potent political resource—consider recent attempts in the United States to use tariffs to maintain a domestic steel industry—examining how natural resources are enrolled in visions of a national future strikes me as being more important than ever. The rigid equation of domestic industry with the one true path to national greatness holds appeal in the early twenty-first-century United States because the lived experience of industrial prosperity remains in recent memory. But analogies between past and present are inevitably undermined by changes in the historical context. Bergslagen's role in Sweden's Great Power era was sometimes mobilized a century ago, but there were important differences between the past and the present (including the geological differences between ores from northern and central Sweden, and replacement of wood with coal as the primary fuel for iron processing). Nor could assessments of current and future technology be reduced to functions of knowledge about the geological properties of the ore and the engineering limits on its processing. Sverker Sörlin has argued persuasively that optimistic visions of Norrland as an engine of Swedish industrialization in the early twentieth century rested heavily on faith in a future modernization. Iron, hydropower, forestry, and railways could in some

combination produce the industry that provided such a potent yardstick of national strength. Rather than attempting to revive conditions from the past, or stave off unwanted change, advocates of northern industrial development invoked the promise of the new and the yet-to-come.

Nevertheless, the experiences and conditions of the present are essential components of attempts to make future developments seem both plausible and desirable. Frank Sejersen has pointed to the power of what he terms "proxy-futures" to represent a future grounded in the lived experience of the presence, for instance through invocation of the economic and social relations surrounding an aluminium smelter in Iceland as a proxy-future for a similar development in Greenland, and thus to shape public opinion (Sejersen 2015). His description of a proxy-future as "a juxtaposition of the wanted and the expected, framed in the form of something that is realizable" (Sejersen 2015: 76) offers hints as to why advocates of domestic processing could never bridge the gap between projection and practice. Sweden's lack of coal precluded a replication of the Ruhr Valley. Substituting electricity for coal remained largely hypothetical. And increasingly optimistic assessments of the ore reserves undermined arguments that exports in the present would necessarily preclude domestic industry in the future. But perhaps most importantly, the capital generated from ore exports constituted a flexible resource that actors across the political spectrum could enroll in their visions of a bright national future, supporting everything from welfare to defence spending to infrastructure. Through spending in the present that future could be made to seem tangible in a way that an industrial boom in the north could not, aided by the existence of relevant infrastructure from railways to export contracts. The path was not found. It was chosen.

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NOTES

[1] At the turn of the twentieth century the older spelling *Gellivare* was still predominant, whereas today the name of the town is almost always spelled *Gällivare*.

[2] The cuttings are held in the TGO collection, catalogue numbers 1063–1067.

[3] That newspaper's political position was neatly captured by a subsequent article that depicted "the hydra of socialism" as the primary obstacle to Sweden's national-economic competitiveness with other developed countries (*Tidning för Skaraborgs Län* 1906*b*).

REFERENCES

Newspapers

Aftonbladet (1901*a*). "Bank- och malmbolags-affärerna" ['The bank and ore company business'], *Aftonbladet* 29 September.

Aftonbladet (1901*b*). "Blick på pressen. De norrbotniska grufföretagen och staten" ['A look at the press. The Norrbotten mining companies and the state'], *Aftonbladet* 28 December.

Aftonbladet (1902). "Staten och de norrbottniska malmbolagen" ['The state and the Norrbotten mining companies'], *Aftonbladet* 31 January.

Aftonbladet (1906). "Järmalmsexporten III" ['The iron ore export, part III'], *Aftonbladet* 13 November.

Aftonbladet (1913). "Malmexportens ökande" ['The growth of ore exports'], *Aftonbladet* 5 April.

Bergqvist, O. (1912). "Malmexport och nationalekonomi" ['Iron ore exports and national economics'], *Svenska Dagbladet* 9 February.

Cassel, G. (1906*a*). "Vår järnmalm och vår politiska ekonomi" ['Our iron ore and our political economy'], *Svenska Dagbladet* 31 May.

Cassel, G. (1906*b*). "Vår järnmalm och vårt försvar" ['Our iron ore and our defence'], *Svenska Dagbladet* 9 June.

Cassel, G. (1907). "Kunna vi förädla våra malmer inom landet?" ['Could we process our own ores domestically?'], *Svenska Dagbladet* 29 April.

Cassel, G. (1912*a*). "Har vi råd att försvara oss?" ['Can we afford to defend ourselves?'], *Svenska Dagbladet* 5 February.

Cassel, G. (1912*b*). "Malmexportens nödvändighet" ['The necessity of ore exports'], *Svenska Dagbladet* 15 February.

Cassel, H. (1906*a*). "Är en ståltillverkning i stor skala möjlig i vårt land?" ['Is large-scale steel production possible in our country?'], *Svenska Dagbladet* 6 March.

Cassel, H. (1906*b*). "Är ett stort nationellt uppsving på det ekonomiska området tänkbart?" ['Is a great national upswing in the economic arena conceivable?'], *Svenska Dagbladet* 23 February.

Cassel, H. (1907). "Inlandsbanan och malmtransporterna" ['The inland line and the transport of ore'], *Svenska Dagbladet* 10 October.

Cassel, H. (1908). "Svensk grufvindustri i Norge" ['Swedish mining in Norway'], *Svenska Dagbladet* 1 February.

Cassel, H. (1909). "Elektrisk smältning af järnmalm och dess ekonomiska betydelse för vårt land" ['Electric iron ore smelting and its economic significance for our country'], *Svenska Dagbladet* 10 January.

Dagens Nyheter (1902). "Främlingsfaran" ['Stranger danger'], *Dagens Nyheter* 8 February.

Dagens Nyheter (1903). "Det stora grufköpet" ['The great mine purchase'], *Dagens Nyheter* 23 April.

Dagens Nyheter (1905). "Sverges och utlandets järnproduktion" ['Swedish and overseas iron production'], *Dagens Nyheter* 20 March.

Dagens Nyheter (1906*a*). "Malmtullen i ny upplaga" ['A new version of the ore duty'], *Dagens Nyheter* 20 March.

Dagens Nyheter (1906*b*). "Den 'praktiska' malmtullen" ['The "practical" ore duty'], *Dagens Nyheter* 23 March.

Dagens Nyheter (1906*c*). "Norrbottensmalmerna inför tyska riksdagen" ['The German parliament takes on the Norrbotten ores'], *Dagens Nyheter* 8 December.
Fäderneslandet (1905). "Bortslösningen" ['The waste'], *Fäderneslandet* 17 May.
Göteborgs Aftonblad (1905*a*). No title, *Göteborgs Aftonblad* 3 May.
Göteborgs Aftonblad (1905*b*). "Den stora skandalen" ['The great scandal'], *Göteborgs Aftonblad* 17 May.
Göteborgs Aftonblad (1906). "En uppgift för den nya regeringen" ['A task for the new government'], *Göteborgs Aftonblad* 6 June.
Göteborgs Handels- och Sjöfartstidning (1905). "Utförseltullen å järnmalm" ['The export duty on iron ore'], *Göteborgs Handels- och Sjöfartstidning* 11 May.
Göteborgs Handels- och Sjöfartstidning (1906). "Malmfältsfrågan" ['The ore field question'], *Göteborgs Handels- och Sjöfartstidning* 22 May.
Göteborgs Handels- och Sjöfartstidning (1907*a*). "Malmfältsfrågan" ['The question of the ore fields'], *Göteborgs Handels- och Sjöfartstidning* 11 January.
Göteborgs Handels- och Sjöfartstidning (1907*b*). "Från malmfältsdebatten" ['From the debate on the ore fields'], *Göteborgs Handels- och Sjöfartstidning* 3 May.
Heckscher, E. (1912). "Våra malmfält och vårt försvar" ['Our ore field and our defence'], *Aftonbladet* 5 February.
Helsingborgs-Posten (1907). "Regeringens malmfältsproposition" ['The government's proposal for the ore fields'], *Helsingborgs-Posten* 22 March.
Högbom, A. (1912). "Från sommarkurserna i Uppsala" ['From the summer courses in Uppsala'], *Dagens Nyheter* 22 August.
Kjellén, R. (1906). "Malmfältsfrågan" ['The question of the ore fields'], *Göteborgs Handels- och Sjöfartstidning* 13 December.
Kronlund, G. (1907). "Malmfältsfrågan" ['The question of the ore fields'], *Göteborgs Handels- och Sjöfartstidning* 4 January.
Lithander, P.E. (1907). "Malmfältsfrågan" ['The question of the ore fields'], *Göteborgs Handels- och Sjöfartstidning* 2 January.
Lundström, V. (1913). "En ödesdag" ['A fateful day'], *Norrköpings Tidning* 8 May.
Nordenmark, N.E. (1907). "Hvilken användning böra inkomsterna af malmfältsaffären få?" ['To what use should the income from the ore field business be put?'], *Svenska Dagbladet* 8 May.
Nordsvenska Dagbladet (1905). "Mot malmtullen" ['Against the ore duty'], *Nordsvenska Dagbladet* 13 May.
Norrbottens-Kuriren (1902*a*). "Järnvärk i Norrbotten" ['Ironworks in Norrbotten'], *Norrbottens-Kuriren* 11 July.
Norrbottens-Kuriren (1902*b*). "Utländsk undersåtes rätt att inmuta och bearbeta mineralfyndighet samt besitta fast egendom i Sverige" ['A foreign citizen's right to claim and work mineral finds and to own real estate in Sweden'], *Norrbottens-Kuriren* 27 December.
Norrköpings-Tidningar (1901). "Staten och de norrbotniska grufaffärerna" ['The state and the Norrbotten mining business'], *Norrköpings-Tidningar* 6 September 1901.
Norrköpings-Tidningar (1911). "Svensk järnmalm och tysk Marockopolitik" ['Swedish iron ore and German policy regarding Morocco'], *Norrköpings Tidningar* 23 August.
Nya Dagligt Allehanda (1901*a*). "För dagen. Den norrbotniska malmbolagens rekonstruktion" ['From the day before. The reconstruction of the Norrbotten ore company'], *Nya Dagligt Allehanda* 25 September.
Nya Dagligt Allehanda (1902*a*). "För dagen. Staten och de norrbottniska malmbolagen"

['From the day before. The state and Norrbotten ore companies'], *Nya Dagligt Allehanda* 1 February.

Nya Dagligt Allehanda (1902*b*). "Vår stora norrländska fråga. Skydd för Sveriges intressen" ['Our great Norrland question. Protection for Sweden's interests'], *Nya Dagligt Allehanda* 4 February.

Nya Dagligt Allehanda (1906). "Hur tyskarna begagna svensk malm" ['How the Germans avail themselves of Swedish ore'], *Nya Dagligt Allehanda* 17 August.

Nya Dagligt Allehanda (1907*a*). "Cl. Adelsköld om malmfrågan" ['Cl. Adelsköld on the ore question'], *Nya Dagligt Allehanda* 15 April.

Nya Dagligt Allehanda (1907*b*). "Väntans tider" ['The time of waiting'], *Nya Dagligt Allehanda* 20 April.

Nya Dagligt Allehanda (1907*c*). "Malmproblemet och Inlandsbanan" ['The ore problem and the Inland Line'], *Nya Dagligt Allehanda* 17 July.

Nya Dagligt Allehanda (1908). "Spaniens och Sveriges malmtillgångar" ['The ore reserves of Spain and Sweden'], *Nya Dagligt Allehanda* 29 February.

Olsson, W. (1903). "Utsikter till en stor järnförädlingsindustri i Norrbotten" ['Prospects for a great iron processing industry in Norrbotten'], *Nya Dagligt Allehanda* 16 May.

Olsson, W. (1907). "Malmpropositionen" ['The ore proposal'], *Dagens Nyheter* 18 April.

Opartisk (1907). "Järnmalmsfrågan" ['The iron ore question'], *Stockholms Dagblad* 1 May.

Östgöten (1913). "Vår järnmalmsexport" ['Our export of iron ore'], *Östgöten* 14 February.

Skånska Aftonbladet (1906). "Malmexporttullen" ['The iron export duty'], *Skånska Aftonbladet* 9 March.

Social-Demokraten (1905*a*). "Ett nederlag för bolagsintresset" ['A defeat for the interests of the companies'], *Social-Demokraten* 11 May.

Social-Demokraten (1905*b*). "Malmexporttullen" ['The export duty on ore'], *Social-Demokraten* 15 May.

Social-Demokraten (1906*a*). "Mera påtryckningar?" ['Further impositions?'], *Social-Demokraten* 23 February.

Social-Demokraten (1906*b*). "Järnbäraland" ['The land carried by iron'], *Social-Demokraten* 24 February.

Social-Demokraten (1906*c*). "Det stora förslaget i Norrbotten" ['The great Norrbotten proposal'], *Social-Demokraten* 12 May.

Social-Demokraten (1906*d*). "Kirunabolagets malmexport" ['The Kiruna company's ore exports'], *Social-Demokraten* 14 July.

Socialdemokraten (1906*e*). "Från översta Nordens rike" ['From the kingdom of the high North], *Socialdemokraten* 1 August.

Social-Demokraten (1907*a*). "I malmfältsfrågan" ['In the question of the ore fields'], *Social-Demokraten* 11 April.

Social-Demokraten (1907*b*). "Vad staten borde ha" ['What the state ought to have'], *Social-Demokraten* 24 May.

Social-Demokraten (1912). "Malmexporten" ['The export of ore'], *Social-Demokraten* 13 February.

Stockholms-Bladet (1906*a*). "Våra naturtillgångar under utländskt kommando?" ['Our natural resources under foreign control?'], *Stockholms-Bladet* 23 February.

Stockholms-Bladet (1906*b*). "Den afviga metoden" ['The reverse method'], *Stockholms-Bladet* 19 March.

Stockholms-Bladet (1906*c*). "Ett storartadt svenskt järnverk" ['A mighty Swedish ironworks'], *Stockholms-Bladet* 12 March.

Stockholms Dagblad (1901). "Staten och malmfälten i Norrbotten" ['The state and Norrbotten ore field'], *Stockholms Dagbladet*, morning edition, 28 October 1901.
Stockholms Dagblad (1903). No title, *Stockholms Dagblad* 18 April.
Stockholms Dagblad (1905*a*). "Våra järnmalmstillgångar. Divergerande uppfattningar" ['Our iron ore reserves. Differing opinions.'] *Stockholms Dagblad* 12 May.
Stockholms Dagblad (1905*b*). "Exporttull på järnmalm" ['Export duties on iron ore'], *Stockholms Dagblad* 9 May.
Stockholms Dagblad (1910). "De slumrande millionernas uppväckande" ['The awakening of the slumbering millions'], *Stockholms Dagblad* 9 January.
Stockholms Handelstidning (1905). "Exporttull å järnmalm. Skola grufdistrikt läggas öde?" ['Export duties on iron ore. Should the mining region be laid waste to?'] *Stockholms Handelstidning* 13 May.
Stockholms-Tidningen (1901*a*). "Malmbergen som stats-egendom" ['The ore mountain as state property'], *Stockholms-Tidningen* 7 December.
Stockholms-Tidningen (1901*b*). "Sveriges kredit inför utlandet" ['Sweden's credit overseas'], *Stockholms-Tidningen* 5 December.
Stockholms-Tidningen (1903). "Våra malmberg och vår järnindustri" ['Our ore mountain and our iron industry'], *Stockholms-Tidningen* 18 May.
Stockholms-Tidningen (1906). "Malmförädlingsproblemet" ['The ore processing problem'], *Stockholms-Tidningen* 5 October.
Svenonius, F. (1912). "Vårt malm-problem" ['Our ore problem'], *Nya Dagligt Allehanda* 6 February.
Svenska Dagbladet (1902*a*). "Från Gellivare til Narvik" ['From Gellivare to Narvik'], *Svenska Dagbladet* 21 August.
Svenska Dagbladet (1902*b*). "Norrbotten och dess ekonomiska utveckling" ['Norrbotten and its economic development'], *Svenska Dagbladet* 2 December.
Svenska Dagbladet (1903). "Stenar i stället för bröd" ['Stones instead of bread'], *Svenska Dagbladet*, 18 May.
Svenska Dagbladet (1906*a*). "Exporttullen å järnmalm" ['Export duties on iron ore'], *Svenska Dagbladet* 26 February.
Svenska Dagbladet (1906*b*). "Malmfrågan ännu en gång" '['The ore question yet again'], *Svenska Dagbladet* 12 November.
Svenska Dagbladet (1906*c*). "Malmfrågan" ['The ore question'], *Svenska Dagbladet* 24 November.
Svenska Dagbladet (1906*d*). "Malmförädlingen vid Luleå" ['The ore processing at Luleå'], *Svenska Dagbladet* 24 December.
Svenska Dagbladet (1907*a*). "Principen för svensk malmpolitik" ['The principle for Swedish ore policy'], *Svenska Dagbladet* 22 March.
Svenska Dagbladet (1907*b*). "Öfverenskommelsen mellan staten och Grängesbergsaktiebolaget" ['The agreement between the state and the Grängesberg company'], *Svenska Dagbladet* 22 March.
Svenska Dagbladet (1907*c*). "Uppgörelsen med malmbolagen och inlandsbaneförslaget" ['The settlement between the ore company and the inland line proposal'], *Svenska Dagbladet* 2 April.
Svenska Dagbladet (1907*d*). "Staten och mineraltillgångarna" ['The state and the mineral reserves'], *Svenska Dagbladet* 28 December.
Svenska Dagbladet (1908). "Dunderland Iron Ore Company, Lim. Ett tragiskt kapitel ur bolagsbildningars historia" ['Dunderland Iron Ore Company Ltd. A tragic chapter

from corporate history'], *Svenska Dagbladet* 26 August.
Svenska Morgonbladet (1903). "Den stora malmfältsfrågan" ['The great ore fields question'], *Svenska Morgonbladet* 8 May.
Tidning för Skaraborgs Län (1906*a*). "I en finanspolitisk fråga" ['In a financial-political question'], *Tidning för Skaraborgs Län* 4 September.
Tidning för Skaraborgs Län (1906*b*). "I ett par finanspolitiska frågor (fortsättning)" ['In a pair of financial-political questions (continued)'], *Tidning för Skaraborgs Län* 18 September.
Törnebohm, A.E. (1905). "Våra malmtillgångar" ['Our ore reserves'], *Stockholms Dagblad* 18 April.
Vänsterman (1912). "Vidräkningar. Järnmalm och försvar" ['Indictments. Iron ore and defence'], *Dagens Nyheter* 9 February.
Vårt Land (1903*a*). "Den stora malmstrusten under statsbeskydd" ['The great ore trust under state protection'], *Vårt Land* 16 April.
Vårt Land (1903*b*). "Hvad är sanningen i Malmbergsfrågan?" ['What is the truth in the ore mountain question?'], *Vårt Land* 14 May.
Vårt Land (1906*a*). "Regeringens dubbelkapitulation" ['The government's double capitulation'], *Vårt Land* 12 May.
Vårt Land (1906*b*). "Den norrländska malmexporten" ['The Norrland ore exports'], *Vårt Land* 16 July.
Vårt Land (1906*c*). "Järnmalmsexporten" ['The export of iron ore'], *Vårt Land* 20 November.
Vårt Land (1907). "I malmfrågan" ['In the ore question'], *Vårt Land* 8 April.
Vårt Land (1908). "Statens ekonomiska initiativ" ['The state's economic initiative'], *Vårt Land* 5 February.

Published Literature

Adelsköld, C. (1907). *Uttalanden i malmfrågan och andra i sammanhang med denna på dagordningen stående för Sverige viktiga frågor* ['Statement on the ore question and others related to the important questions currently facing Sweden'], Stockholm: Nord. bokh.
Ahlström, G. (1966). *De mörka bergen. En krönika om de lappländska malmfälten* ['The dark mountains. A chronicle of the Lapland ore fields'], Stockholm: Norstedt.
Åström, Y. (1965). *Hjalmar Lundbohm. "Lapplands okrönte kung"* ['Hjalmar Lundbohm. "Lapland's uncrowned king"'], Stockholm: LT:s förlag.
Avango, D. (2005). *Sveagruvan. Svensk gruvhantering mellan industri, diplomati och geovetenskap 1910–1934* ['The Svea mine. Swedish mining between industry, diplomacy and earth science 1910–1934'], diss., KTH Royal Institute of Technology, Stockholm: Jernkontoret.
Avango, D., Nilsson, A.E. & Roberts, P. (2013). "Assessing arctic futures. Voices, resources, and governance," *Polar Journal*, 3:2, pp. 431–446.
Barck, Å. (1990). *LKAB 100 år* ['LKAB 100 years'], Kiruna: Mediafolket.
Bridge, G. (2010). "Resource geographies 1. Making carbon economies, old and new," *Progress in Human Geography*, 35:6, pp. 820–834.
Brunnström, L. (1981). *Kiruna – ett samhällsbygge i sekelskiftets Sverige* ['Kiruna—a social structure in turn-of-the-century Sweden'], diss., Umeå: Umeå University.
De Geer, G. (1961). *Järnet. Stormakt i svenskt näringsliv* ['Iron. The great power in Swedish economic life'], Stockholm, Rabén & Sjögren.

Glete, J. (1987). Ägande och industriell omvandling ['Ownership and industrial change'], Stockholm: SNS Förlag.
Hansson, S. (1994). *Porjus. En vision för industriell utveckling i övre Norrland* ['Porjus. A vision of industrial development in upper Norrland'], diss., Högskolan i Luleå.
Heckscher, E. (1907). *Till belysning af järnvägarnas betydelse för Sveriges ekonomiska utveckling* ['Towards an illumination of the significance of railways for Sweden's economic development'], Stockholm: Centraltryckeriet.
Johansson i Backe, C.E. (1977). *Kiruna. Stad och vildmark* ['Kiruna. Town and wilderness'], Stockholm: Norstedt.
Lindblad, H. (2015). *Karl Staaff. Försvaret och demokratin* ['Karl Staaff. The armed forces and democracy'], Stockholm: Ekerlids.
Lynch, M. (2002). *Mining in World History*, London: Reaktion Books.
Magnusson, L. (2006). "The economist as popularizer. The emergence of Swedish economics 1900–30," in *Swedish Economic Thought. Explorations and Advances*, ed. L. Jonung, London: Routledge, pp. 82–108.
Meinander, N. (1968). *Gränges. En krönika om svensk järnmalm* ['Gränges. A chronicle concerning Swedish iron ore'], Stockholm: Grängesbergsbolaget.
Myhr, K.J. (ed.) (2015). *Boken om LKAB* ['The LKAB book'], Luleå: LKAB.
Nyland, J.E. (2009). *Forestry Legislation in Sweden*, Uppsala: Swedish University of Agricultural Sciences.
Persson, C. (2000). "Glimtar ur Kirunas tidiga historia" ['Glimpses from the early history of Kiruna'], *Norrbotten Årsbok*, 2000, pp. 168–185.
Persson, C. (2015). *Hjalmar Lundbohm. En studie om ledarskap inom LKAB 1898–1921* ['Hjalmar Lundbohm. A study of leadership within LKAB 1898–1921'], diss., Luleå: Luleå Technical University.
Sejersen, F. (2015). *Rethinking Greenland and the Arctic in the Era of Climate Change. New Northern Horizons*, London: Routledge.
Sörlin, S. (1987). *Framtidslandet. Debatten om Norrland och naturresurserna under det industriella genombrottet* ['The land of the future. The debate concerning Norrland and natural resources during the industrial revolution'], Stockholm: Carlssons.
Wetterberg, G. (2013). *Wallenberg. Ett familjeimperium* ['Wallenberg. A family empire'], Stockholm: Albert Bonniers.

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Heat in a Cold Climate

Household Energy Choices in the Scandinavian North, 1890–1970

ABSTRACT This article examines the timing, scale and cause of transitions between different kinds of household energy use and especially heating in northern Sweden, with a focus on Norrbotten, between the late nineteenth century and 1970. It examines the related but separate histories of the adoption of new heating technologies, such as stoves and boilers, and the choice of fuels, such as firewood, coke, oil, and electricity, providing new data on the scale of consumption and timing of transition. The article demonstrates the important linkage between domestic fuel choice and labour markets, whether labour in farm and forest affecting stove use in the nineteenth century, or increased female labour participation outside the home and rising wages in the twentieth. The article goes beyond discussions of price and technology to consider the wider contexts of domestic use not only in terms of home life, but also industrial development and labour markets in northern Sweden.

KEYWORDS energy, labour, heating, coal, oil, electricity, environment, Sweden, Norrbotten

This paper examines the development of household fuel use in northern Sweden, with a particular focus on household heating in the country's northernmost county, Norrbotten. In this article we focus the role of energy for households with an emphasis on how new forms of ener-

gy became available for the household and how this both changed the way domestic work was organized, but was also adopted according to norms of household labor. More widely, although domestic heating is recognized as a significant aspect of the experience of home life, comfort, and domestic practices, there is surprisingly little historical literature on the topic. Most of that which exists treats it as an incidental aspect of histories of domestic comfort, seeking to explain norms of behavior rather than fuel choices (e.g. Brewer 2000). In turn, "practice theory," influenced by sociology and anthropology, has used historical exemplars primarily with an eye to current policy and as a means of illustrating how transitions in domestic heating cannot be reduced to decisions over price or the inevitable consequence of technological advance (e.g. Shove *et al.* [eds.] 2012; Shove & Trentmann [eds.] 2018; Rinkinen *et al*. [eds.] 2019). The purpose of this article is not to test any particular theory or to develop arguments for use in current policy-making (although they may be inferred). Rather it is to empirically reconstruct patterns of heating use to demonstrate the eclectic ways through which change can be understood. An important finding is to recognize that households' experience of energy transitions cannot be separated from the developments that are taking place in larger energy systems, governed by the state and business. It is well known, for example, that the drive towards electrification in northern Sweden was in part driven by the desire for regional industrial development, but other sectors also provided important spillovers into the domestic energy market (Warde 2019). At the same time, change may be driven by shifts in non-energy markets such as labor which impact on domestic energy practices and desired services. We do not present a history of the *experience* of heating, which may well have been rather more diverse than narrow data on fuel use and heating standards suggests. This would certainly be a desirable avenue for future research.

I

Norrbotten has always been a periphery with rich natural resources, long distances and comparatively poor conditions for agriculture. Its northern location causes a short growing season, and cold temperatures. The population density has always been low compared to the rest of the country. From an energy point of view, the county is, however, an interesting case of an energy system created around a nexus of heavy industry, private capital, state intervention and the ordinary household. The industrialization of the county only came with the second industrial revolution, characterized by a large-scale use of electrical technologies, probably unrivalled in a Swedish perspective. The region's industrial structure has for long been significantly divided between a small number of very large capital- and energy-inten-

sive export industries, combined with a relatively weak small industrial and service sector. The whole northern region of Sweden had relatively small urban areas such as Luleå and Umeå, with populations in the low tens of thousands for much of the twentieth century. The net effect is that Norrbotten has had a less industrial occupational structure than Sweden as a whole, whilst being more industrial than other northern counties.

Table 1. Urbanisation in Northern Sweden and the whole country.

	Norrbotten	Västerbotten	Sweden
1810	5%	3%	9%
1850	5%	2%	10%
1890	8%	4%	19%
1930	12%	8%	33%
1950	18%	13%	47%
1960	21%	19%	52%
1967	39%	47%	55%

Norrbotten towns: Luleå, Boden, Piteå, Kiruna and Haparanda.
Västerbotten towns: Umeå and Skellefteå. Source: SCB 1969: 61 ff.

Although the agricultural population peaked around 1930 and fell thereafter, the industrial workforce only overtook the agricultural during the 1950s (Enflo *et al.* 2014). Investments in the county's industry were therefore characterized from an early date by international industrial capital and government involvement.

The county bears several of the characteristics of a latecomer in terms of industrial development as proposed by Alexander Gerschenkron: heavy investments and a leading role played by the state as an organizer and provider of capital, followed by high growth rates based on modern technology (Gerschenkron 1962). At the same time, Norrbotten also had the characteristics of a staple economy as the concept was discussed by Harold Innis, with an infrastructure and industrial structure designed for exporting staples, rather than refining products for final consumption (Innis 1930). This was particularly characteristic of forestry products and the rich deposits of iron ore. Although a major steel and pulp and papermaking industry expanded rapidly after the Second World War, much production was orientated towards intermediary rather than final products. The county's economy grew rapidly in periods of major infrastructural investment and the opening up of resources to external markets, notably in the 1890s, 1920s, and from the

late 1940s to the early 1960s (Hansson 2006). This story will be traced up until the 1970s, when the response to the oil crisis saw the development of district heating as a main source of energy for urban communities, which had now come to dominate a population that subsequently stagnated, removing the choice of heating technology from a majority of domestic households (Summerton 1992; Kaiserfeld 2005; Söderholm 2018).

With this general background in mind, we will examine how the energy distribution and consumption of households in Northern Sweden was shaped by these circumstances. This perspective implies, of course, that industrial activities, the large-scale of organization of energy flows and decisions made by large players such as the state, big companies and municipalities, as well as actors in households themselves must be taken into account. It is also necessary to recognize that the Norrbotten case cannot be separated from developments in other parts of the country, a consequence of energy technologies being universally available and since energy networks were not only becoming increasingly national, but also international. Finally, the cold climate would itself tend to increase the household energy consumption. A measure of this effect are the so-called "heating degree days," the sum of the number of days with temperatures below 15 °C, times the degrees below 15. Heating degree days are shown in Table 2.

Table 2. Mean heating degree days after region 1980–2010.

District	Mean monthly heating degree days 1980–2010	Per cent of Stockholm
Sweden	449	130
Stockholm	345	100
Central Norrland	469	136
Northern Norrland	542	157
Southern Sweden	300	87
Western Sweden	329	96

The data refers to spatial dimensions only and is not weighted by population. The Swedish average is therefore dominated by Northern Sweden. Source: Created with the Konema database.

The table shows that the heating days in northern Norrland, which comprises Norrbotten, exceeds Stockholm by 57 per cent. This means that the basic household energy requirements were likely to be considerably higher in the north compared to the south, although as we will see that did not straightforwardly lead to higher fuel consumption.

II

Right up until the 1940s, wood provided the largest source of energy (measured simply by heat content) in Norrbotten (Warde 2019). During the nineteenth century household energy consumption was of a traditional kind, i.e. open stoves which after 1870 came to be replaced more and more by iron stoves. The wood barns for the larger farms give some idea of the wood consumption, which was probably around 20–40 cubic metres per year for larger households at big farms (see Fig. 1).

Fig. 1. Wood barn from a nineteenth-century Norrbotten farm at Hägnan out-door museum, Luleå (2004). Photo: Magnus Lindmark.

This is confirmed in surveys taken in different parts of northern Sweden between 1905 and the early 1950s (Ödman 1920; SOU 1924:42: 9–10; SOU 1948:32; SOU 1954:24). Normal practice was that the wood barn was large enough to accommodate two years of use. Recently-felled firewood dried on one side of the barn, while the other side was used for the present year's consumption. However investigations in the 1920s showed that the moisture content of firewood was still quite high, much higher than kiln-dried wood, and hence a proportion of the heat from combustion in the fireplace would have been lost to driving out that remaining moisture to make the

wood flammable. Birch was the preferred tree species, but this was partly determined by availability (SOU 1924:42: 26). It should be noted that the relatively slim dimensions of domestic firewood and the fact that birch was prioritized, meant that there was no competitive relationship with either charcoal for industrial use, which was made from small to medium dimension pine, nor the sawmill timber comprising old-grown and very large spruce. It may also be noticed that an important on-farm use of heat was boiling fodder for the livestock during the winter season to improve nutritional uptake. This practice is well known from several sources, while more detailed information was found in a most unexpected source material, children's stories from the early 1950s describing the history of their local communities. With fodder running out around April to mid-May, spruce branches and lichen were collected and chopped into small pieces. Subsequently, hot water was poured over them and after soaking for a couple of hours it was fed to the cows.[1]

As late as the 1950s rural farm households overwhelmingly supplied firewood for themselves, in over 80 per cent of smallholdings with up to two hectares of arable, and universally in farms with over 10 hectares of cultivated land (SOU 1954:24). The children's stories also tell us that it was common to cut dry wood (Swedish *torrfuror*) for firewood in "the old days."[2] The practice was, according to one of the stories, that the firewood was collected during the winter, and that one man with a horse could bring home one big load of dry firewood in a day. The most common wood was pine. Dry spruce was used if a very high temperature was needed, for example when the so-called *rieska* bread was baked. Spruce was, however, never used in the open stove as it sparked extensively. Sometimes the timber for firewood was cut in spring. Here, we also learn about the superstition that wood should be cut at new moon, as such fuel was believed to dry better. When wood was cut in the spring it was called *baato*. When the autumn came, the trees were de-limbed (Swedish *kvistade*) and stacked in the forest. The firewood was only brought home during the winter.

A total fuel consumption of approximately 3.44 solid cubic metres per person per year was proposed in a survey concerning of 666 farm households in Värmland, a more southerly part of northern Sweden in the early 1920s, although this figure was a little higher in the colder parts of that region (SOU 1924:42: 28). The authors of the report thought that this was as much to do with the easier availability of wood in the north as the colder climate. The first survey of farms was not taken in Norrbotten until 1944, aiming to reconstruct pre-war levels of wood consumption. Although the sample for the whole of Norrland was 646, for the Norrbotten it was only 217 (SOU 1948:32). This provided an estimate of 7.65 cubic metres of stacked wood

per capita, which equates to around 5 cubic metres of solid wood—similar to that found for the larger and northernmost farms in Värmland in the 1920s. Consumption was higher inland, and it was suggested that this was the result of limited markets for labor, which was hence channeled into wood cutting. Later estimates for 1936, when coke probably still made up no more than 10 per cent of the market, reckoned that household consumption of firewood was around 6 cubic metres per person. These however derive from a rather uncertain origin in the estimates of "industry experts" in 1939 (SOU 1951:32). During the First World War authorities agreed in 1917 that 5 cubic metres per person was the amount required to cover essential household fuel needs in Norrbotten (SOU 1922:14: 209). If consumption had changed or not before these dates is very difficult to determine due to a lack of archival material, but the lack of information is itself perhaps an indication that firewood was not scarce. Customary law made it clear that farmers were free to log for household requirements even on forests owned by the Crown.[3] Generalizing, one could say that the cost for firewood was the opportunity cost of labor. If one has ever attempted to fell a birch tree with a hand saw, split the log with a wedge, cut it to smaller pieces and then split the pieces again with an axe, one knows that it involves heavy work that most people would gladly avoid. The question is then if there was an alternative use of labor during the winter months or not. Dan Bäcklund claimed that there were alternative uses for labor and various jobs being done also during the winter, while Nils Gustav Lundgren argued that the winter was largely a period of idleness (Bäcklund 1988; Lundgren 1984).

The early industrialization of Norrbotten from the 1870s had implications for the use of domestic energy, not through new infrastructures for energy, but through new technologies and practices within the household. Chief among these was the iron stove, replacing older hearths or tile stoves. Our argument is that the rural economics of firewood changed as the sawmills' demand for timber gave rise to a wage labor market for loggers in the late nineteenth century. At this time the rural population of Norrbotten was also expanding rapidly, with households combining a mix of agricultural work on small plots with forestry. Farm horses were also an essential element of forestry work for the removal of timber to water for log drives, and remained so until after the Second World War. The expanding wage labor market increased the opportunity cost for firewood. At the same time, rising incomes, in conjunction with falling iron prices made iron stoves more affordable. Still, it is worthy of note that a traditional open stove was a rather expensive piece of equipment but that the iron stove required new sets of pans and pots. This would have created an incentive to economize on firewood and, probably, the best way to do so was to invest in an iron

kitchen stove, since the iron stoves had a higher thermal efficiency than the traditional fireplaces.[4]

Nevertheless, this explanation for the timing of the dissemination of the stove remains informed guesswork and deductive reasoning. We do not know, for instance, to what degree the better thermal efficiency was used for saving wood or for creating a more pleasant indoor temperature, let alone creating a more comfortable working environment for women in the household. However warmth throughout the house did come to matter to women. A survey taken by Gallup of rural married women in 1943 as to the two changes that would most improve the quality of their lives, central heating ranked second after piped water and sewage disposal, with 24 per cent of respondents naming it (SOU 1947:46: 103). This was far ahead of other options, especially electric light and holidays which were named by only one per cent! Evidence based on interviews and oral history testimony points to the impact of the stove on everyday life as having been important (Sixtensson 2001).

The iron stove produced much more heat and one informant, interviewed in the 1950s about conditions around the turn of the century, noted:

> the heat from the iron stove was several times more than open stoves, and the people started to mount double glazing, so that the ice disappeared from the window glass at winter.

The iron stove also burned wood at a slower rate than the open stove, heating the iron itself from which heat radiated. This also meant that much less oxygen was consumed, which during winter led rooms other than the kitchen to actually become colder, as the chimney lowered the air pressure in the whole building, causing outdoor air to be sucked into the house. It is worth noting that the iron stove came first, *followed* by insulation to utilize heat that with earlier types of stoves would have gone up the chimney. The much smaller air intake of the new stoves also meant that less air was sucked into the chimney. This informant continued that

> the iron stoves were so hot so that the people started to walk around indoors more or less half dressed. And they tore down and threw away the bed-cabin and stated to sleep on the coach and in the imperial bed as the upper class. And the women had clean hands all day although they made fire and prepared the food. (Sixtensson 2001)

This statement tells us that there was indeed a considerable improvement in indoor temperature, and that the common practice before the iron stove must have been to wear "outdoor clothes" inside the house. Evidence on

this question is however rare and further research as to the impact of such change highly desirable. Furthermore, the bed-cabins, typical of northern Sweden, a bed design with closable doors, was abandoned. These beds have been identified as a means to conserve heat, but at the cost of facilitating the spread of contagious disease and providing literally a hotbed for lice. Obviously, the clean hands refer to soot and ashes, but also again points at the iron stove as a tool used primarily by women. The informant (in their particular style and dialect) noted,

> And afraid of soot should the women now became. They became almost like the gentleman's house maid, when they slammed the iron stove shutter and baked bread and pastry. Yes, the iron stove showed for everyone who visited what kind of women that were in the household. (Sixtensson 2001)

These statements are more suggestive of an income effect than a fuel-saving aspect behind the spread of the iron stove. Furthermore the informant suggests that the final stages of the preparation of the firewood, for which smaller pieces were used in the iron stove, was work for boys, not men.

> Many were the boys who sniffled and cried when they were forced to saw and split the firewood, when the bow saw was blunt and the birch wood was twisted like some kind of screw and too big and tough for the axe and full of large twigs. (Sixtensson 2001)

Although we cannot be sure how the total household energy consumption was affected, this suggests caution in the assumption often made in modelling that firewood consumption was higher the further one goes back in time because of the efficiency gains from improved models of stove.

We can however be certain that the introduction of the iron stove in northern Swedish households was directly related to an increased importance of paid work through attaining the capacity to purchase them. Nils Gustav Lundgren estimated that income from logging corresponded to at least 100 working days per year for a normal inland household at the turn of the century (Lundgren 1984). As income rose stoves became more affordable, at the same time it is likely, as we argued above, that the opportunity costs for domestic provision of firewood rose. It is also likely that this altered the opportunity cost of women's work. As argued by Dan Bäcklund, marginal activities at the farm, such as "outland farming," including harvesting of natural grown grass on mires, disappeared as paid forest work became more common (Bäcklund 1988). In short, Bäcklund argues that women's unpaid

domestic work became even harder, as men gave up some of the work at the farm for paid logging work. The female labor that could be saved with an iron stove may have been a motive for this investment. Without doubt, the iron stove provided additional utility in the form of an improved indoor environment and more comfortable women's work. It is therefore not surprising to find statements indicating that the iron stove was a marker of status among women. However Ruth Schwartz Cowan has argued that in America, the development of better stoves may have saved work for men, who spent less time cutting firewood, but increased expectations and hence the labor of cooking and cleanliness for women (Cowan 1984). It may have been the nature rather than the hours of female labor that changed.

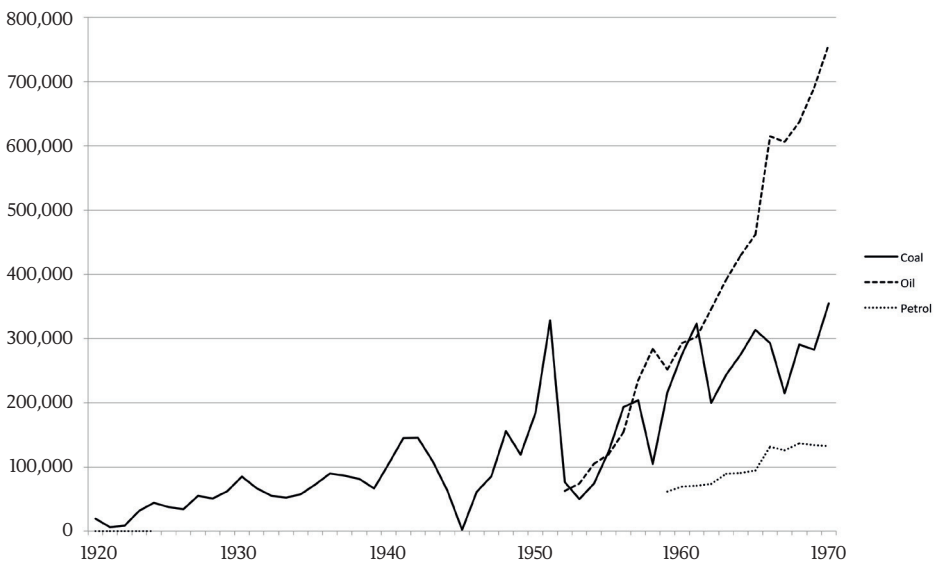
III

The first wave of change in domestic energy use in Norrbotten was related to the first industrial revolution, both in the provision of cheap iron and demand for forestry products. The use of wood fuel remained significant until after the Second World War, assisted by the scarcity of coal supplies during and in the immediate aftermath of the war.

But despite the dominance of firewood, there was a major expansion of coal imports (usually in the form of coke) from a minimal level in the early 1920s to reaching a third of Norrbotten's energy requirements by end of the 1940s (SOS Sjöfart 1911–1988). The small amount of coal arriving around 1900 was largely landed at Luleå and used by the iron industry or at Sunderbyn's brickworks (BiSOS 1900; Bergsten 2004: 100–111). Although some coal was used for metal-smelting, it remains a mystery—or at least a matter for investigation—where exactly the tens of thousands of tons arriving each year by the 1920s were used (see Fig. 2). When the Hushållningssällskapet investigated installed boilers in Norrbotten with a consumption of more than 500 hectolitres in 1932, no less than 82 boilers where reported in Luleå. These consumed reportedly 38,000 hl (c. 2,200 tons) of coke. The consumption by the boilers for which the specific annual consumption was not stated, we estimated at an additional 9,000 hl. We estimate the total consumption in Piteå at 3,600 hl, Boden 8,550 hl, Överkalix 705 hl and Haparanda 3,900 hl, making for a grand total of 3,200 tons of coke for the purpose of space heating in larger buildings in these towns (AN: Enskilda arkiv 20 F5:4).[5] It is likely that only Luleå had extensive use outside of public and commercial dwellings, as only around a quarter of the users fell into this category (presumably apartment blocks). Later estimates were that 22,000 tons of coke were used as household fuel in Norrbotten in 1936, a year in which nearly 90,000 tons of coal and coke were landed in ports from Skellefteå to Haparanda (SOU 1951:32; SOS Sjöfart 1911–1988). Many of the region's steam

engines were fueled with offcuts and waste from forestry, and the railways remained a mix of electrified line (going east-west and carrying ore from Kiruna and Gällivare) and steam (branch lines and the north-south route towards Stockholm). It seems likely that coal imports, that had long been the case in Sweden, were encouraged by their use as ballast in ships that were freighting timbers and iron ore, a spillover effect. This was especially the case in 1915, when 0.85 million tons of coal were offloaded in Luleå by German vessels seeking ore for the war effort. Anomalous years like this aside, the evidence is consistent with—but we can say no more than that—domestic coal use following roughly the same trend as imports to the region.

Fig. 2. Fossil fuels landed at ports from Skellefteå to Haparanda, 1920–1970 (tons).

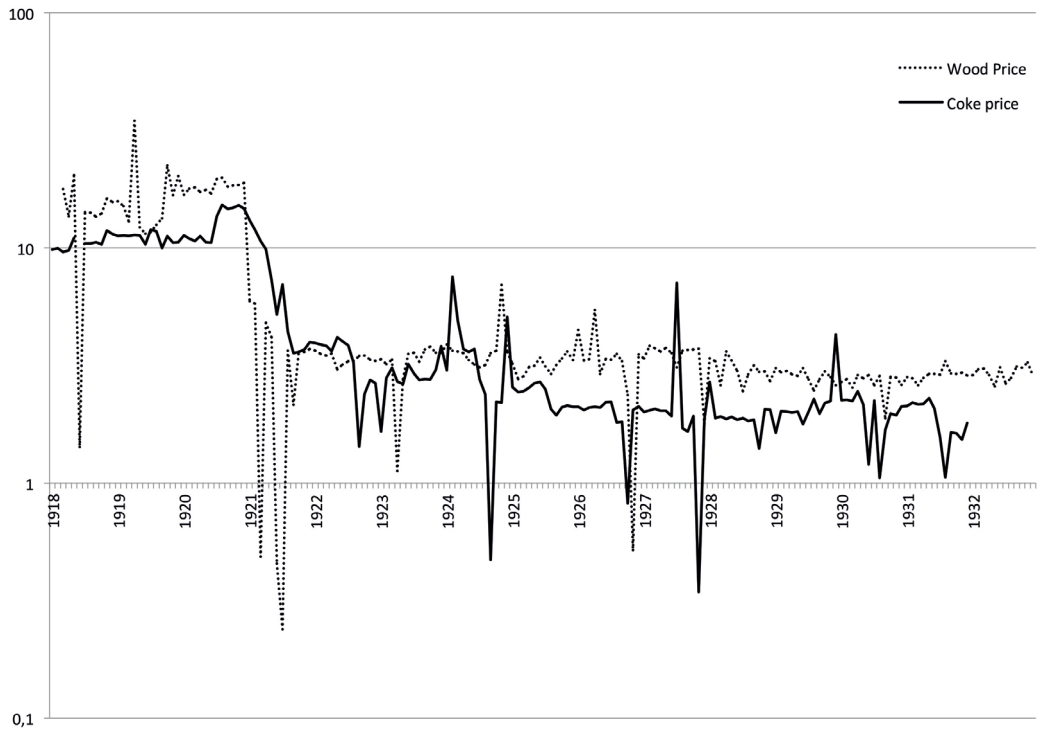


The graph includes fuel for all uses, not only households. From c. 1950 the great majority of coal and coke was for industrial use. Oil data is only recorded from 1952. Source: SOS Sjöfart 1911–1988.

Direct evidence of domestic coke use remains difficult to obtain. From the early 1920s, by which time coke was already the dominant household fuel in Stockholm, industrial censuses recorded fuel use, albeit rather unreliably (SOU 1922:56: 14). As these incorporated commercial premises such as newspaper offices and printers, cafés, bakers or butchers it is possible to see what the typical fuels for heating were. In 1925, twenty businesses in Luleå

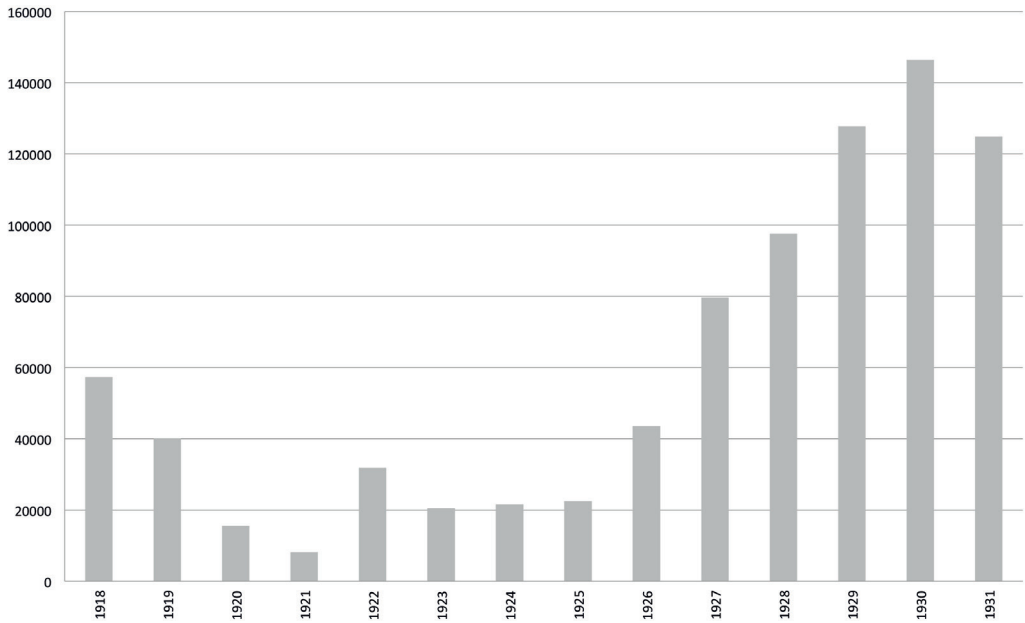
recorded fuel use, but only 7 listed coke or coal. By 1935, 25 businesses listed fuel consumption (out of 38), but only 10 recorded using coal or coke. The fuel economy, as is so often found, was mixed, but this result is still somewhat surprising (AN: Nbm 613 H:1–4). The account books of coal and fuel merchants show a clear price advantage for coke from 1925, presented in Fig. 3. This is matched in the quantities of fuel sold; before the middle of the decade most months saw greater sales of firewood from Luleå's main coal and building merchants, but after this date coke was dominant (see Fig. 4). These only provide a sample of the total number of consumers, but are indicative in terms of the scale and frequency of household purchases. By the late 1920s the company was selling over 10,000 tons of coke and coal each year, largely to household consumers, and must have dominated the Luleå market (AN: SE 534//1/G4–5).

Fig. 3. Average monthly price of wood and coke by estimated heating value sold by Luleå Kol & Materialaffär, 1918–1933 (SEK per hectolitre coke equivalent, log scale).



The wood series is a weighted average of birch and pine sales. The wood series has been adjusted to the heating equivalent in coke as estimated at the time. Source: AN: SE 534//1/G4–5.

Fig. 4. Annual sales of coal and coke from "Special account" of Luleå Kol & Materialaffär, 1918–1931 (hectolitres).



The "Special account" provides the most complete series of monthly data and made up the majority, but not all, of the company's sales. Source: AN: SE 534//1/G4–5.

By 1932 the scale of market penetration by coke was sufficient that the county government commissioned a study of relative fuel costs because of fears that it would supplant firewood and prevent the possible expansion of local forestry. This may have followed debates in the Parliament and national interest on the same question since 1930 (AN: Enskilda arkiv 20 F5.4). The study's conclusions draw our attention again to the significance of labor costs in choosing fuel. Officials checked the fuel use and boilers in a range of municipal offices, schools, banks, post offices, and commercial premises, and found coke use to be very widespread (often, again, in combination with firewood). The market prices for firewood and coke were by that date reckoned to be equivalent, regarding heat content (this may have been true more widely in the coastal region, but our own data suggests that in Luleå itself coke was already cheaper). Most boilers however could only take short pieces of wood, while coke could be shoveled in easily. Providing wood of suitable dimensions for the boilers required both higher processing costs in the forest, and also greater costs in transport and distribution. At the

same time, the volume of wood that could be fed into a boiler, and its lower energy density, meant that each fire lasted considerably less time than was the case with coke—according to the report, only around a quarter. The efficiency of wood-burning could vary considerably according to the type and moisture content of the wood.[6] A wood fire needed considerably more labor and monitoring, and in some places, finding space for wood stores was a problem. This is indicated by a document of the Luleå Tenants' Association of 1946, which reckoned heating hot water for an apartment with a bathroom to require 6 cubic metres of *pannved* (wood for boilers), or 18 hectolitres (1.8 m^3) of coke (AN: Enskilda arkiv 451.EV).

The county administration's study spent a considerable amount of time calculating, given the costs of tending the fire, the price to which firewood would have to fall to be competitive with coke in boilers of particular sizes. As it stood, the use of central heating in larger buildings or apartment blocks therefore favored coke. As shown in Table 3, the share of urban households dwelling in apartments with central heating was highest in Luleå and Boden in 1920, with around 5 and 8 per cent respectively, as compared to the national average around 4 per cent

Table 3. Share of apartments with certain amenities 1920.

Share of appartments with:	Bath	Central heating	Gas	Electricity
Luleå	3.4%	5.4%	0.0%	84%
Boden	1.6%	8.1%	0.0%	82%
Kiruna	1.1%	3.2%	0.0%	83%
Malmberget	0.6%	2.3%	0.0%	93%
All Swedish towns	4.2%	4.3%	31.6%	78%

Source: Kungl. Socialstyrelsen 1949.

The share of apartments with central heating was lower in the mining towns of Kiruna and Malmberget. This share had already risen to 40 per cent in Luleå by 1933, and 61 per cent by 1939, a similar share in Boden and above 30 per cent in Kiruna and Malmberget (Kungl. Socialstyrelsen 1949; Kungl. Socialstyrelsen 1952). Most northern towns expanded rapidly from the 1920s, but Kiruna had much of its housing stock completed by 1930, probably accounting for its slower expansion of amenities. Much of Boden's housing was built between 1936 and 1945 (Kungl. Socialstyrelsen 1952: 36–38, 211). However, construction of new dwellings cannot explain these trends entirely, as the rate of growth in central heating provision ex-

ceeded the provision of new housing stock and thus must involved some retro-fitting. In turn, this development has provided a major incentive towards switching fuel. What remained notable about Norrbotten was the absence of gasworks. By the 1940s this meant that every other urban residence in Norrland had an electric cooker, used at least in the summer, and in Norrbotten the proportion was probably higher. But a 1939 report still pointed to a "general lack of labour-saving devices for heating, water and waste" as a defining difference between rural and urban dwellings (SOU 1939:6: 76; SOU 1948:32).

By this time the beginnings of electrification, connected to the second industrial revolution, was already decades in the past. Norrbotten had in some regards been in the very forefront of this, even in an international perspective. In retrospect it is, however, clear that two energy and infrastructural systems developed in parallel: one large-scale system formed by the needs of the mining industry, and one being shaped by the more modest requirements of households. Still, the households in Norrbotten initially held an advantage in comparison to the rest of the country concerning the diffusion of electricity.

In the wake of the new ironmaking technologies of the late nineteenth century it became feasible to extract the phosphorous ores from the huge and rich orefields of Gällivare and Kiruna. However this would require transport links via either Luleå on the Gulf of Bothnia, or Narvik on the Norwegian coast. The major investment to achieve this came from the Swedish consortium Luossavaara-Kiirunavaara AB (LKAB) which was formed in 1890 for exploration and mining around Kiruna. Investments by the Swedish state would have an enormous influence on the fortune of the mines, in the long-run leading to the iron and steel sector being by far the most significant single industry in the region. The aspiration to develop the ore fields and industry more generally would also result in infrastructural development with major implications for the household use of energy. A large military installation was built at Boden to protect the ore fields from invasion from the east and in 1898 parliamentary agreement was reached in Sweden and Norway to extend the Gällivare–Kiruna railway to the west coast. In 1904, the large central Swedish mining company Grängesberg (TGO) became the main owner of both LKAB and AB Gällivare Malmfält, while at the same time a political dispute emerged between liberals and conservatives on whether the mines should be nationalized. After the conservative victory in the 1906 parliamentary election, it was decided, as a compromise, that half of LKAB's shares should be purchased by the state. Norrbotten's industrialization process was from an early date based on heavy investment, supported by nationalist ideas and optimism about profits, which equally applied to

the energy system (Hansson 2006; Viklund 2012).

The difficulty and expense of transporting loads on the "ore railway" and especially the Kiruna–Narvik line, along with difficulties in operating steam engines in the extreme Arctic conditions, lead to major investment in electrification of the railway and provision of power. This was achieved by the state-sponsored construction of the Porjus dam on Luleälven, completed in 1914 (Hansson 1994). At 55 MW this was then one of the largest hydropower projects in Sweden. The power plant was deliberately oversized to provide a basis for other industrial establishments in the area. Here we see another trait in the industrial development in Norrbotten, namely an active industrial policy, which would also be decisive both in the 1940s and 1970s. Roine Viklund has shown how the electrification of the railroad was part of wider nationalist industrial policy (Viklund 2012). The project made great demands on technological development, including the development of transmission lines and powerful electrical locomotives.

In the case of electrification, it is also important to remember that there were two parallel processes. At the same time as the Porjus plant was built, a number of smaller power plants for local power supply for lighting purposes were launched on municipal, private and co-operative initiative. Many were converted water mills equipped with a generator for local electricity supply. Porjus accounted for 88 per cent of the total installed hydroelectric power around 1923. About 10 per cent of the total electricity production was then based on steam in thermal plant. Staffan Hansson has called Porjus and the associated distribution system "Norrbotten's mega system," fully adapted to the needs of the mining industry. The established towns' electricity supply was generally based on significantly smaller plants, but the towns that grew rapidly to provide a workforce for the mines, notably at Kiruna, were connected to the "mega system." Concerted efforts at rationalization were led by the county government at the end of the 1910s to integrate local providers into the larger regional grid, and by the 1920s Norrbotten had a much greater presence of electrical motors than other regions of northern Scandinavia (Hansson 1991; Warde 2019).

Norrbotten's households seem to have benefited from the early industrial electrification as the share of households with electrical light was somewhat higher in Norrbotten than in the country as a whole, as figures for 1920 previously shown in Table 3 reveal. By the end of the Second World War 99 percent of dwellings in urban Sweden were electrified (that is, had electric lighting), but coastal regions of Norrbotten were among the best connected rural regions nationally, also reaching around 99 percent. More remote inland areas had reached 85 percent, reaching 96 percent by 1950 (SOU 1947:3: 76; SOU 1951:32: 14). In combination with the increasingly

widespread installation of central heating, this made it easier to use multiple rooms in the house simultaneously and easily move between them, making in turn reliance on a central boiler more desirable. Such standards had also become the norm in the construction of especially urban housing. Indeed a report of 1947 articulated the expectation that the great majority of urban residences built after 1919 would have central heating (SOU 1947:3: 59).

IV

In the late 1940s domestic energy use remained very much a mixed energy regime. Firewood was still prevalent as we have seen, with many, especially rural households being dependent on the iron stove fueled with wood, as they had been for decades. In towns, stoves fueled by wood or coke provided both space heating and heat for cooking, although use of electrical hobs was becoming more widespread. By 1947 there was an electric cooker for every 3.5 inhabitants in 9 surveyed towns in northern Sweden, suggesting that they were now present in nearly every dwelling. Approximately a quarter of rural dwellings in the four northern counties (Norrland) of Sweden had electric cookers (SOU 1947:3; SOU 1948:32). The greater prevalence of coal and coke in cities was probably driven by availability associated with its use as ballast and demand from locomotives and steam engines, although elec-

Fig. 5. Coke deliveries by A. Johnson & Co to apartments with central heating in Luleå, 1954. Photo: Espling Rune. Source: Luleå kommuns historiska bildarkiv.

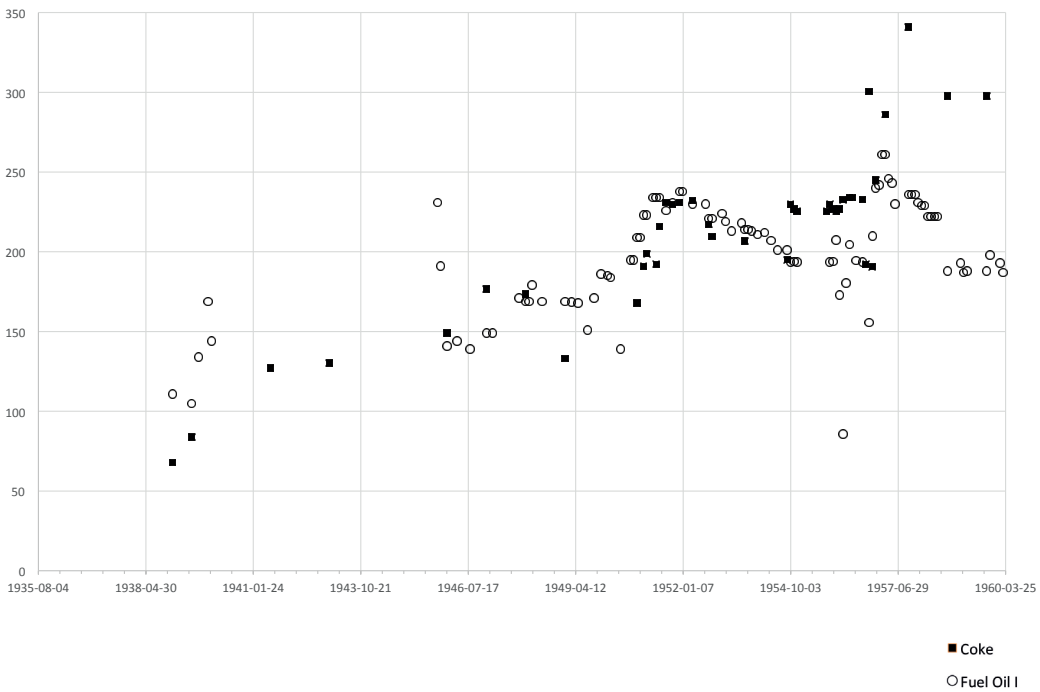
trical motors were the major source of stationary power. Given that purchases from coal merchants suggest that roughly 1.5 tons of coke (25 hectolitres) were consumed per household annually, this would have sufficed for 10,000 households if all the coke had been used for these purposes.[7] Calculations by the Luleå Tenants' Association at this time of fuel use in a typical apartment block with 20 apartments and 4 shops came to 49 hl per unit, or around 3 tons of coke, 22 per cent of which was used for hot water and the rest for heating (Fig. 5).[8] This in turn suggests that most households purchasing coke were not in fact using it as their sole fuel but mixing it with others, probably wood. However it may also have been the case that centralized boilers in apartment blocks were run for longer. In some blocks heating was arranged centrally, but in others individually by each tenant, indicating that they must also have had separate boilers. The transition to fossil fuel is sometimes observable in tenant contracts and purchases, as with a tenant's contract from 1921 that stated that, "to the apartment belongs space in the wood barn." However, by 1932, this property saw 417 SEK spent on coke and coal, but only 85 on firewood.[9]

However during the 1950s coke virtually disappeared as a household fuel in Sweden. This was a national trend, and the revolution also impacted the north, as all older fuels were replaced by oil (SOU 1957:4: 12, 19). Low oil prices after the war are a central part of this story. Falling prices were clearly seen by the oil industry itself as the main reason for the expansion of demand (SOU 1957:4: 13). Between 1952 (when navigation statistics first distinguish between fuel oil and other oil products) and 1960 oil imports rose fivefold in Norrbotten and tenfold by 1970 (SCB Sjöfart 1911–1988). Nevertheless, there are other aspects to this story aside from price. First, the ongoing electrification had supported the diffusion of electrical household equipment. Electric stoves increased at the expense of both the iron and the gas stove. As demand for gas dropped it was no longer profitable to produce the main by-product, namely coke whose supply began to fall nationally. By 1954 it is clear that the landing of coal in Norrbotten was predominantly directed to the NJA steelworks in Luleå. In 1955, NJA consumed around 190,000 tons of coke (Jonsson 1987: 276). By the late 1950s, the coal merchant Larson & Lind continued to sell between 1,000 and 2,000 tons each year to industrial users and steamships, but the household market had largely disappeared although apartment blocks still used small amounts of coke at this date (AN: Enskilda arkiv 17 AB Larson & Lind, 17 January 1963).

This transition is visible in business activity. Coke and coal merchants such as Larson & Lind and the Luleå Kol & Materialaffär also provided building materials or dealt with shipping, selling fuel inland to the consumer or property associations of Kiruna. They dealt generally with heavy material

arriving at the town's wharves. Surviving account books suggest that domestic sales were geographically limited (AN: Enskilda arkiv 17 Larson & Lind G3; AN: SE/534//1/G4–6). But fuel suppliers large enough to be listed in the telephone books of the 1940s were restricted to Kiruna and Malmberget, and came in the category "wood and coal" rather than "coke and coal." Inland in smaller settlements it is likely that households either self-supplied or could easily purchase firewood. By 1953, a rapid change was underway. Although more coal merchants in Haparanda and Kalix were now advertising in the telephone book, fewer businesses marketed firewood, and we can find firms selling heating oil equipment (including in Haparanda). Oil suppliers were however identical to the owners of petrol stations that had already proliferated throughout the region. Only a year later, the number of retailers advertising oil-burners leapt upwards, although many were still actually based in southern cities like Gothenburg. By the early 1960s, as well as coke merchants and petrol stations supplying heating oil, oil-burning equipment

Fig. 6. Price of coke and Fuel Oil No. 1 in Luleå, 1939–1961 (m^3 oil equivalent).



Each marker denotes the price of a purchase by the Luleå Tenants' Association or the Gradin family for their apartment blocks. Coke price has been set at the contemporary equivalent of heat content for a cubic metre of fuel oil, where 28.9 hectoliters of coke are reckoned to be equivalent to 1 cubic metre of oil. Sources: AN: Enskilda arkiv 451:1 E5; Enskilda arkiv 609, Bränslekostnader.

could be installed by a range of heating engineers based in the region's larger settlements: Kiruna, Kalix, Piteå, Boden, Haparanda, Gällivare, and of course Luleå, as well as southern suppliers being active.[10]

Fig. 6 shows price evidence from the tenants' association in Luleå. Seen purely in terms of the cost of the heat content, coke and fuel oil had roughly reached parity by the autumn of 1951, and oil become markedly cheaper from the autumn of 1955, the latter change driven by the rising price of coke. Even the oil price spike of the Suez crisis did not dent its price advantage. In between these dates there was no clear advantage, although oil was slightly more expensive, demonstrating that there was more to the transition already under way than just the contemporary market price. By the early 1960s, fuel oil was 20–25 per cent cheaper in nominal prices than had been a decade earlier, so home heating was becoming considerably cheaper in real terms.

Fig. 7. Oil cisterns in Luleå, Pontushamnen, 1930s. Photo: Gustaf Holmström. Source: Luleå kommuns historiska bildarkiv.

Of course, in the countryside where four-fifths of the population still lived, things were different. Generally, the premium of fossil fuels over the Luleå price in nearby towns was low—no more than 5–7 per cent for fuel oil in the early 1960s in Boden, Piteå or Kalix, for example. However in more remote settlements, like Pajala, Vittangi or Arjeplog the premium was much higher,

at 20 per cent, and doubtless higher still at earlier dates when oil's penetration into the domestic market was not yet underway. In contrast, the price of firewood, driven largely by labor, was much less variable generally being within 5–10 per cent of the Luleå price if purchased on the market. Unless one had access to cheap firewood as a by-product of another activity, coke and oil were already cheaper fuels in the coastal region at the beginning of the 1950s, but far inland a price advantage for oil was probably established later in the decade. By the early 1960s, it was the cheapest fuel by far nearly everywhere (AN: Enskilda arkiv 20:1 F5:4).[11]

Boilers used for residential heating could just as easily be fired with wood or coke. The Gradin family, who owned an apartment block on Storgatan in central Luleå built in the 1930s, had been pioneers in installing an oil-fired boiler for central heating but later in that decade added a wood kiln to this equipment as oil became increasingly expensive and hard to obtain during the war. Later in the 1940s this could be used to burn coke, which continued to be used alongside oil until 1958 (AN: Enskilda arkiv 609). However conversion to oil required considerable expense. In 1957, calculations obtained by the Luleå Tenants' Association shows that installing the smallest oil-burner viable for apartments to have cost around 3,200 SEK, a similar price to 300 hectolitres of coke. Given that this could be as much as ten times a household's annual consumption of coke, the capital investment was clearly very large for free-standing properties. However the marginal cost for buying larger burners was quite small, and ceased to rise once a consumption of 1,400 hectolitres was reached (probably the size of a large apartment block) (AN: Enskilda arkiv 451.EV). Based on the initial investment the incentives to switch to oil were thus much greater for those running collectively-managed blocks, a type of housing that expanded rapidly in the post-war years in urban areas. By 1965, 80 per cent of urban dwellings in Norrbotten had central heating with some kind of boiler, and in smaller settlements 65 per cent and nearly half of rural housing (SOU 1965:32: 60).

However we have already seen that the labor intensity of tending the boiler was a significant consideration in fuel choice (Fig. 8). Whilst coke had an advantage over firewood, oil-fired boilers required less attention than either. In 1932 it was reckoned that firewood required more labor in the form of stoking as compared to coke. As the boiler needed to be refueled every second or third hour there was an additional cost estimated at 1.56 SEK per corresponding hectolitres of coke (AN: Enskilda arkiv 20 F5:4). Thus, it was far from only the fuel price itself that determined the price of the heat service from coal and firewood, but also the trend of increasing wages. This is important because after the Second World War Sweden entered an unprecedentedly long period of high, unbroken real wage growth, with its highest

rates in the early 1950s. Interestingly, the early 1920s were also a period of very rapid growth.[12] An informant born in 1946 tells us that in his childhood home, a two-storey building built the year of his birth with central heating and with one apartment of three rooms and a kitchen on each floor, they would frequently alternate between using wood and coke depending on the season and the coke price. The boiler, however, required close su-

Fig. 8. Advertisement for Götaverken boilers 1930. Source: *Affärsvärlden* 27 March 1930.

pervision and during the winter was filled with fuel morning, noon and evening. When the informant's mother started to work in the early 1960s, it was no longer possible to heat the boiler with solid fuels.[13] The old boiler was therefore converted to oil by inserting a relatively cheap oil burner and installing an oil tank of 3–4 cubic metres in the basement where solid fuels had previously been stored.[14] Government officials also noted that the low handling costs of an oil boiler were an incentive to switch (SOU 1957:4: 13).

Changing from solid fuels to oil was therefore not a major investment if a burner could be installed without the need for a new boiler. Much must have depended on the ease with which older boilers could be converted into oil-burners. When capital costs were still high, it suggests that labor market considerations must have been important to such a switch, which otherwise made little financial sense. Such considerations were evident from the Swedish Association of Creameries from the late 1940s to early 1960s, as their members considered the merits of switching to oil-burners. Around 1950 oil was still too expensive, despite the savings in wages, but near the coast creameries were using coal over the next decade. By the early 1960s coal was no longer considered an option, and oil had become very considerably cheaper. But a major incentive to switch was the fact, already demonstrated at Kalix's creamery, that an oil furnace required only 13 per cent of the labor-hours of wood in stoking (AN: Enskilda arkiv 20 F5).

Again, there were several lines of development converging at this point in time. The rise in the importance of women's work outside the household may have been a factor in this process. The opportunity cost of solid fuels rose as female wage labor became more frequent in the 1950s. By 1950 around 75–80 per cent of young unmarried women were working, but between 1950 and 1965 the proportion of married women of all ages working rose from 14 per cent to 30 per cent, a trend particularly marked among women aged 35–54, rising from around 15 to 37–38 per cent (SCB 1968: 22–23, 102–103). Although shares were lower in Norrbotten they understate the reality because married women working on farms were not included. Growing prosperity had led to a rapid diffusion of the private car after the war. This led to an induced demand for petrol produced in Swedish refineries. As a consequence, the supply of heavier fuel oils increased proportionally since the output mix of different oil grades in the refining process is basically constant, and supply of petrol necessarily meant the supply of fuel oil. The increased supply of fuel oil contributed to the low oil prices. Simultaneously, electrical household appliances, including the electric cooker, the washing machine and the refrigerator, along with an increased output of manufactured and semi-manufactured foodstuffs, helped to increase the productivity of household work. The increased efficiency of household labor as well as

growth in service sector employment outside the home increased the supply of female labor to the market. As the children of the post-war baby boom became teenagers around 1960s, switching from solid fuels to oil became one of the essentials, at least for families living in one-family houses. Oil use did give flexibility in that the boiler could be switched on and off with no loss of fuel. In contrast, once a solid fuel fire was lit, it had to be left to burn down. This meant that where equipment allowed switching, it was preferable to use more expensive solid fuels through the winter, but the more flexible oil outside of the coldest months—a strategy we can see was adopted by Luleå's apartment block owners (AN: Enskilda arkiv 609, 9 February 1940).

The choices faced were different, although related, for those owning individual houses, and those running apartment blocks with collective boilers. Price concerns, and the costs of installing new equipment were common to both, but labor costs were reflected differently through the opportunity cost of time, or the price of paying a wage for someone to keep the boiler running (probably in combination with other work as a janitor). However the increasing proportion of the population who lived in apartments would have had such choices made for them, and only had an opportunity to raise concerns through the tenants' association (Ivarsson & Tengling 1988). Fuel costs seem to have been generally subsumed into rents.[15] The investigations undertaken by the Luleå Tenant's Association also show that a daytime indoor temperature of 18 °C and a night time temperature of 15 degrees were considered reasonable. The reports do, however, show that these were not always maintained, and that indoor temperatures slightly above 10 degrees were reported. In the private block owned by the Gradin family, with a generally well-to-do set of professional tenants, shops, and offices, a basic fuel charge included in the rent with a supplement added after the actual costs of fuel were calculated at the end of the heating year (in September). The supplement was scaled according to a set proportion for each apartment, so individual tenants had no control over the level of payment, nor any incentive to economize on use.[16]

V

It is clear that the organization of the household's energy supply became more connected to the large scale energy infrastructures after the 1930s. The evolution of household energy became more intertwined with developments in manufacturing industry as well as with wider energy policy, which up until the first oil crisis in 1973 and the growing environmental concerns during the late 1960s, was essentially part of the general industrial policy.

During this period there was one development that would have important repercussions for domestic energy use beyond 1970, namely the con-

struction of a steel plant in Luleå in 1939. Although by the 1970s economic problems led to the effective bankruptcy of both NJA and the wider Swedish steel industry, a rescue package from the state in 1979 saw all Swedish steel plants unified as Swedish Steel (SSAB). Under the new ownership an extensive modernization and restructuring program was initiated. In connection with this crisis, SSAB and Luleå municipality decided to form a co-owned power company, LuleKraft, to use process gas from the steel and coke plant for the generation of district heating. The plant was taken into operation in 1982, which was comparatively late compared to the provision of district heating in other Swedish municipalities which had started already in the 1950s, then fuelled by oil. The major expansion of district heating, today supplying around 50 per cent of the household heating demand in Sweden, had begun after the oil crisis in 1973. The Luleå district heating system, utlizing waste heat from the steel mill had its origins in the 1970s (Söderholm 2018). Sweden was at that time one of the world's most oil-dependent economies, and the incentives to quickly move away from oil were therefore strong among most economic actors. Government subsidy programs were directed to industry, municipalities and the households with the aim of phasing out oil from the heating systems in the second half of the 1970s. Strategies included the expansion of both district heating and direct electricity.

As the district heating systems were run by the municipality, the regulation at the time stipulated a "self-cost principle," implying that the activity should not generate any profits exceeding the municipality's (low) capital costs. District heating was therefore competitive in terms of prices. Another forceful instrument was the municipal planning monopoly from 1947 which meant that the municipality determines how land is used in the municipality, including plans for every residential area. Municipalities could for instance in these detailed plans decide that if a property owner replaced an old boiler, the property should be connected to the district heating system. This planning monopoly was a significant instrument for expanding district heating. In previous decades consumers had responded to the availability and price of fuels that was often conditioned by wider industrial markets and state action. Now, that autonomy was receding for many urban households.

By 1996 Norrbotten had 16 district heating plants, of which Luleå's was by far the largest. Lesser plants in the urban districts of Kiruna and Piteå made extensive use of waste industrial heat as well as peat and wood. Outside of these operations, even quite small communities operated district heating plants but used the locally available fuels of peat and firewood (NCM 1998).

In the early twenty-first century, Norrbotten remains by far the highest

per capita consumer of energy in Sweden (five times higher than central Stockholm), but this is primarily driven by industrial use, above all in the SSAB plant in Luleå. The gap in household consumption is very much lower but still substantial, at 45 per cent in 2008, having risen from 16 per cent in 1990. One might expect that in the case of heating climate would provide a primary explanation, and is part of the story. However in recent decades Norrbotten has also enjoyed relatively cheap supply: although pricing is obviously a matter of policy on the part of the national distribution network retailers, by the 1980s Vattenfall, the main state-owned electricity supplier and owner of the national distribution company, was offering electricity in Norrbotten at 25 per cent below the average national price. The gap between Norrbotten and its southern neighbors is the cumulative effect of greater use of firewood, district heating and electricity. Rather than being related to labor regimes among rural households who work in their own lots of woodland or as loggers, increasing use of firewood and biofuel in district heating systems is permitted by the use of waste products from the region's now capital-intensive and very highly mechanized forestry industry. Here we see yet another spillover from what is effectively an industrial sector. We may hypothesize that part of the growing gap between Norrbotten and the rest of the country is a result of lock-in to an energy regime that makes extensive use of by-products and keeps prices low (Warde 2019).

We have seen how the domestication of household energy, seen here in a northern perspective, has evolved through various stages, gradually connecting the household to wider energy systems. The first significant moves from the open stove to the iron stove had profound effects on both female domestic work and indoor climate. We therefore argue that there was an important relationship between female work and the domestication of household energy. Simultaneously, the emergence of male paid work provided the means for buying the new energy equipment. As firewood remained the dominant fuel in the countryside, coal became more important in the towns, clearly exemplifying the close relationship between industrial energy demand, where coal was the preferred fuel especially for steam engines and locomotives, and that of the urban household. From the 1920s, electricity also became widespread, partly as a side effect of the industrial need for electricity and subsequent investment in power and grids. The 1950s and early 1960s saw a rapid diffusion of oil as the main fuel, a process driven by low oil prices, but also from the fact handling costs for attending an oil fueled boiler were low compared to coke, not to say firewood. This also had a connection to women's work, as oil liberated the single family household from frequent attention to the boiler. The next stage was set during the 1970s, with a rapid expansion of district heating and centralization of domestic energy systems through this and fur-

ther electrification. If possible future energy scenarios reverse this trend, they will have to take into account the overwhelming importance to people of how they spend their time.

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NOTES

1 Arkivcentrum Norrbotten (henceforth AN) Gunhild Waara, Klass 7 (1952), Bygdespegeln, uppsatser, Tärendö socken, Niva, Storbyn. F 1:25.

2 AN. Sten Juuso, klass 7, Bygdespegeln, uppsatser, Tärendö socken, Niva, Storbyn. F 1:25.

3 This customary law only came in conflict with the state as farmers started to regard logging for selling saw-timber to forest companies as household requirements.

4 For an argument about this transition in America, see Cowan 1984: 57–61.

5 AN: Enskilda Arkiv 20 F5:4. Norrbottens hushållningssällskaps organisationskommitté.

6 On this problem, see SOU 1924:42: 26–27.

7 In 1950 the household sales by Larson & Lind were generally 25–30 hl. At a weight of 610 kg per cubic metre of coke, this would approximate to 1,525 to 1,830 kg of coke if the hl was "solid." However, inevitably it was not, with higher grades of coke coming in larger pieces, and hence leaving more air in between them. Householders generally purchased the middle grade of coke with pieces of 40–60 mm in size. AN: Enskilda Arkiv 17, AB Larson & Lind, 17 January 1963.

8 These were fairly large apartments of 40 m^2. AN: Enskilda Arkiv 451.EV.

9 AN: Enskilda arkiv 252 Alida Granberg G1:1.

10 This is based on a survey of telephone books from 1944 to 1962, first of "district 9" covering most of Norrland, and later Luleå, covering Norrbotten county; and also the local Haparanda telephone book from 1951. Of course, given that advertising in the telephone book had a cost, not all suppliers or engineers would have been covered, but it is likely that those with any substantial business would be.

11 These fuel costs are described in documents supplied in both typed reports and handwritten notes by various creameries around Norrbotten as part of discussions over investment in equipment and fuel within Norrbottens läns producentförening.

12 Real wages are calculated from Prado 2010 and Edvinsson & Söderberg 2010.

13 Interview with man, born in central Umeå in 1946. Umeå 15 March 2016.

14 Instructions for ABSO boilers intended for coke states that oil burners may be installed in boilers larger than 1.5 m^2 by authorised personnel only. AB Skoglund och Olsson AB Trycksak nr 1149-B. AN: Arkiv Familjen Östlings arkiv 539 Ser L1:30.

15 AN: Bodens Hyresgästförening. Arkiv 1201:1: F containing Bränsleklausul för exklusiv-

kontrakt. Statens Hyresråds bränsleklausul, Eskilstuna 1941. See also SOU 1938:22: 208.

[16] See AN: Enskilda Arkiv 609. Heating bills are preserved for most apartments from the mid-1940s to the early 1960s.

REFERENCES

Archives

AN = Arkivcentrum Norrbotten
Bodens Hyresgästförening. Arkiv 1201.
Enskilda arkiv 17. AB Larson & Lind.
Enskilda arkiv 20:1 F5. Norrbottens Läns Producentförening.
Enskilda arkiv 252. Alida Granberg G1.
Enskilda arkiv 451.E. Luleå Hyresgästförening.
Enskilda arkiv 609. Fastighets AB Forellen.
F 1:25 Bygdespegeln, uppsatser.
Familjen Östlings arkiv 539 Ser L1:30.
Nbm 613, Staffan Hanson.
SE 534//1, Luleå Kol & Materialaffär.
Luleå kommuns historiska bildarkiv.

Literature

Anselm, J. (1992). *Vattenkraft och naturskydd. En analys av opinionen mot vattenkraftutbyggnaden i Sverige 1950–1990* ['Hydropower and nature protection. An analysis of opposition against hydropower development in Sweden, 1950–1990'], Linköping: Linköping University.

Bäcklund, D. (1988). *I industrisamhällets utkant. Småbrukens omvandling i Lappmarken 1870–1970* ['On the outskirts of the industrial society. The transformation of small-scale farming in Lapland during the period 1870–1970'] (Umeå Studies in Economic History 8), Umeå: Dept. of Economic History, Umeå University.

Bergsten, J. (2004). "Tegelbruken" ['The brickyards'], in *Sunderbyn under 500 år*, eds. J. Bergsten, Y. Brander, L.E. Nilsson, N. Nyberg, R. Vikström & S.E. Vikström, Södra Sunderbyn: Jan Bergsten, pp. 101–111.

BiSOS = Bidrag till Sveriges officiella Statistik (1900). L, *Statens Järnvägstrafik* ['National rail traffic'], Stockholm: Kongl. Jernvägsstyrelsen.

Brewer, P.J. (2000). *From Fireplace to Cookstove. Technology and the Domestic Ideal in America*, Syracuse: Syracuse University Press.

Cowan, R.S. (1984). *More Work for Mother. The Ironies of Household Technology from the Open Hearth to the Microwave*, New York: Basic Books.

Edvinsson, R. & Söderberg, J. (2010). "The evolution of Swedish consumer prices 1290–2008," in *Historical Monetary and Financial Statistics for Sweden, Volume 1. Exchange Rates, Prices, and Wages, 1277–2008*, eds. R. Edvinsson, T. Jacobson & D. Waldenström, Stockholm: Ekerlid, pp. 412–452.

Enflo, K., Henning, M. & Schön, L. (2014). "Swedish regional GDP 1855–2000. Estimations and general trends in the Swedish regional system," *Research in Economic History*, 30, pp. 47–89.

Eriksson, M. (2015). "Beyond industrial policy. State intervention in the Swedish electrici-

ty supply industry, 1936–1946," *Business History*, 57:6, pp. 1–16.

Gerschenkron, A. (1962). *Economic Backwardness in Historical Perspective. A Book of Essays*, Cambridge, Massachusetts: Belknap Press of Harvard University Press.

Hansson, S, (1994). *Porjus. En vision för industriell utveckling i övre Norrland* ['Porjus. A vision of industrial development in upper Norrland'], Luleå: Luleå University of Technology.

Hansson, S. (2006). "Gigantiska satsningar banade väg för norrbottnisk industrialisering och samhällsomvandling" ['Gigantic investments paved way for industrialization and society transformation'], *Årsskrift 2004–2005 Norrbottensakademien*, Luleå: Norrbottensakademien, pp. 13–28.

Innis, H.A. (1930). *The Fur Trade in Canada. An Introduction to Canadian Economic History*, London: Oxford University Press.

Ivarsson, M. & Tengling, U. (1988). *Ett hem i folkhemmet. Berättelsen om en levande folkrörelse. Hyresgästernas riksförbund 65 år* ['A home in the people's home. The story of a living social movement. 65 Years of the National Tenants' Association], Stockholm: Hyresgästernas riksförbund.

Johansson, N. (2006). "Atlantprojektet. En studie av planerna för det största projektet i svensk vattenkraftshistoria" ['The Atlant project. A study of plans for the largest project in the history of Swedish hydropower], bachelor's thesis, Luleå University of Technology.

Jonsson, S. (1987). *NJA – stålverket i norr. Förhistoria, bildande och första år* ['NJA – the steelworks in the north. Pre-history, creation and first years'], Luleå: Norrbottens museum.

Kaiserfeld, T. (2005). "Värme från när eller fjärran" ['Heat from near or far'], *Historisk tidskrift*, 125:3, pp. 516–524.

Kungl. Socialstyrelsen (1924). *Allmänna bostadsräkningen år 1920* ['General housing census 1920'], Stockholm.

Kungl. Socialstyrelsen (1949). *Allmänna bostadsräkningen år 1939* ['General housing census 1939'], Stockholm.

Kungl. Socialstyrelsen (1952). *Bostäder och Hushåll. Enligt allmänna bostadsräkningen 1945 och därtill anslutna undersökningar* ['Housing and households according to the general housing census of 1945 and associated investigations'], Stockholm: Kungl. socialstyrelsen.

Lundgren, N.G. (1984). *Skog för export. Skogsarbete, teknik och försörjning i Lule älvdal 1870–1970* ['Forest for export. Forest work, technology and supply in the Lule valley, 1870–1970'] (Umeå Studies in Economic History 6), Umeå: Umeå University.

NCM = Nordic Council of Ministers (1998). *Energy Report on the Nordic Parts of the Barents region*, Copenhagen: Nordic Council of Ministers.

Ödman, P. (1920). "Några undersökningar rörande förbrukningen av virke till husbehov inom Västernorrlands landsbygd" ['Some investigations concerning the use of firewood for household need in rural Västernorrland'], *Svenska skogsvårdsföreningens tidskrift*, 18:1–2, p. 1–47.

Prado, S. (2010). "Nominal and real wages of manufacturing workers, 1860–2007," in *Historical Monetary and Financial Statistics for Sweden, Volume I. Exchange Rates, Prices, and Wages, 1277–2008*, , eds. R. Edvinsson, T. Jacobson & D. Waldenström, Stockholm: Ekerlid, pp. 479–527.

Rinkinen, J., Shove, E. & Torriti, J. (eds.) (2019). *Energy Fables. Challenging Ideas in the Energy Sector*, London: Routledge.

SCB = Statistiska centralbyrån (1968). *Folk- och Bostadsräkningen den 1 november 1965* ['The population and housing census of 1 November 1965'], Stockholm: Statistiska centralbyrån.

SCB (1969). *Historisk statistik för Sverige. D. 1. Befolkning 1720–1967* ['Historical statistics for Sweden. Part 1. Population 1720–1967'], Örebro: SCB.

Shove, E., Pantzar, M. & Watson, M. (eds.) (2012). *The Dynamics of Social Practice. Everyday Life and How it Changes*, Los Angeles: SAGE.

Shove, E. & Trentmann, F. (eds.) (2018). *Infrastructures in Practice. The Dynamics of Demand in Networked Societies*, London: Routledge.

Sixtensson, R. (2001). "Spisar och andra eldstäder" ['Hearths and other fireplaces'], *Västerbotten*, 2001:1, pp. 2–11.

Söderholm, K. (2018). "Pioneering industry/municipal district heating collaboration in Sweden in the 1970s," *Energy Policy*, 112, pp. 328–333.

SOS = Sveriges Officiella Statistik, Sjöfart 1911–1988 ['Sea navigation 1911–1988'], Stockholm: Kommerskollegium; www.scb.se/hitta-statistik/aldre-statistik/innehall/sveriges-officiella-statistik-sos/sjofart-19111988/; access date 23 Oct. 2019.

SOU = Statens offentliga utredningar (1922:14). *Statsmakterna och bränsleanskaffningen under krigsåren. Av Bränslekommissionen avgiven berättelse över dess verksamhet åren 1917–1921* ['Government and fuel supply during the war. Report of the Fuel Commission on its activity 1917–1921'], Stockholm.

SOU (1922:56). *K. Socialstyrelsens utlåtande med förslag till lag angående hyresregleringens avveckling m.m.* ['The National Welfare Board's opinion with suggestions on the law regarding the fixing of rents'], Stockholm.

SOU (1924:42). *Förbrukningen av virke till husbehov på Värmlands läns landsbygd. Betänkande avgivet av de Sakkunniga för utredning om anordnande av skogsavverkningsstatistik och taxering av Sveriges samtliga skogar* ['The use of wood for household needs in rural Värmland County. Report of the experts on the investigation of the organisation of wood-felling statistics and measurement of Swedish forests'], Stockholm.

SOU (1938:22). *Betänkande med förslag till reformerad hyreslagstiftning* ['Report with suggestions on the reformed rent laws'], Stockholm: Norstedt.

SOU (1939:6). *Underlättandet av kvinnornas arbete i de mindre lanthemmen* ['The faciliation of women's work in smaller rural homes'], Stockholm.

SOU (1947:3). *Redogörelse för detaljdistributörerna samt deras råkraftkostnader och priser vid distribution av elektrisk kraft* ['Report on distributioners and their basic costs and prices in the distribution of electrical power'], Stockholm: Kommunikationsdepartementet.

SOU (1947:46). *Betänkande angående Familjeliv och Hemarbete* ['Report concerning family life and domestic work'], Stockholm.

SOU (1948:32). *Utredning rörande skogstillgångarna och skogsindustriernas råvaruförsörjning i övre och mellersta Norrland m. m.* ['Investigation into forest access and the supply of forest industry wares in upper and middle Norrland'], Stockholm.

SOU (1951:32). *Bränsle och kraft. Orientering rörande Sveriges energiförsörjning* ['Fuel and power: guide concerning Swedish energy supply and reports on investigations into fuel'], Stockhom: Nordiska bokhandeln.

SOU (1954:24). *Klenvirke. Användningen av barrklenvirke, lövvirke och sågverksavfall. Betänkande* ['Small-diameter wood. Use of small-diameter coniferous and deciduous wood and sawmill waste'], Stockhom: Nordiska bokhandeln.

SOU (1957:4). *Oljelagring* ['Oil storage], Stockholm.

SOU (1965:32). *Höjd bostadsstandard* ['Higher housing standards'], Stockholm.

Summerton, J. (1992). *När fjärrvärmen kom till stan. Ett energisystem växer fram* ['When district heating came to town. Growth of an energy system'], Linköping: Linköping University.

Trägårdh, K.F. (1940). "Kraftledningsbygget Porjus–Västerås" ['Power line construction Porjus–Västerås'], *Teknisk Tidskrift*, 1, pp. 1–7.

Viklund, R. (2012). *Riksgränsbanans elektrifiering. Stat och företag i samverkan 1910–1917* ['Electrifying the border railway. The cooperation of state and private enterprise, 1910–1917'], diss., Luleå: Luleå University of Technology.

Warde, P. (2019). "Energy regimes in the Fennoscandian north, c. 1900–2015," in *The Politics of Arctic Resources. Change and Continuity in the "Old North" of Northern Europe*, ed. E.C.H. Keskitalo, London: Routledge, pp. 140–160.

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Reviews

Frances Abele & Chris Southcott (eds.), *Care, Co-operation and Activism in Canada's Northern Social Economy*, Edmonton: University of Alberta Press 2016, ISBN 978-177212-087-5, 256 pp.

Much has been made in recent years of the transformative potential of the so-called "social economy:" a broad range of place-based activities, from artists cooperatives to local lending programs to self-help projects, all of which seek to create opportunities for job creation, economic regeneration, equity reduction, and enhancement of human well-being and environmental health (Amin *et al*. 2002). Arguably, the concept has been overtheorized in the academic literature (in a way similar to the early literature on adaptive management), with far more people extolling the virtues of the idea than are presenting practical examples of works in progress that we might learn from. Fortunately, Abele and Southcott (2016) do not continue this trend with their fantastic new contribution on social economy in the Canadian North. Rather, they have presented a compendium of practical examples where communities are forging new niches to strengthen local communities through a variety of initiatives, examples that are presented in a structured and easy to digest manner.

Based on work done in association with the Social Economy Research Network of Northern Canada (http://yukonresearch.yukoncollege.yk.ca/sern/), the book provides a scan of fifteen not-for-profit projects in locales across the north, projects that range in nature, from a local periodical to a recycling program, all of which in the editors' words seek to "enhance the social, economic and environmental conditions of communities" (p. xii). The stories are uplifting and compelling, and illustrate the impressive resilience, adaptability, and innovation for which northern peoples are often recognized (Gerlach *et al*. 2018; Pearce *et al*. 2015). Delivered in a structured way, the cases succeed in two ways. First, they give a flavor of the place-based diversity inherent to the challenges being engaged (e.g., from the complex health issues facing the Inuit and Metis of Labrador to the practical challenges of running a greenhouse in the food and energy insecure land of the midnight sun). Second, they effectively highlight the importance of details that some might mistake

as menial or prosaic to project success. Indeed, every case shares similar section headings, including "History," "Impact on Community," and "The Reasons for Success and Barriers to Success."

Likewise, there are examples from a cross-section of sectors, from health to journalism to fisheries, making the volume useful for other researchers and practitioners in a variety of sectors. For example, a case study by Boutet of the Torngat Fish Producers Co-operative (Chapter 3) offers multiple helpful insights for my and others' work in the area of enhancing community fisheries and food security (e.g., Loring, Gerlach & Harrison 2013; Brinson, Lee & Rountree 2011).

Admittedly, the near cookie-cutter format of the cases does make the book a difficult cover-to-cover read. Though some of the cases do manage to exhibit a lot of colour and local essence, the repetitive nature starts to make the overall volume feel dry and repetitive. Given how place-based each of these great cases are, I worry that some important detail is missed because of the format.

The only other point to note about the volume is that while the authors do well to situate each case in the broader issues at hand (employment, HIV, men's health, climate change, etc.), I find myself wondering whether these local successes can remain durable through the next decades, given the tremendous impacts we expect on northern communities because of climate change, biodiversity loss, and their concomitant social impacts through food and energy markets, migration, and environmental security. Ostensibly, social enterprise is important both in how people come together to address specific challenges, but also because how, in so doing, they strengthen community capacity to respond to other changes and surprises (Southcott 2015; Armitage *et al*. 2011). What is missing in this volume is a compelling discussion of how or whether this happens, how these projects translate to enhanced adaptive capacity or perhaps even sovereignty, the latter being perhaps the most important determinant of how northern communities will respond to the impacts of climate change (Loring 2017).

These minor points aside, the volume is sure to be of value to a variety of readers. It certainly stands out for how well it foregrounds local action without overshadowing the lessons in jargon or theorizing, and this is a refreshing change. For academic audiences, I suggest pairing this with Southcott's (2015) earlier contribution. For policy-makers, I urge close attention to the volume, both for the inspiring agency and creativity that these cases illustrate, and also to the evidence they provide that local people, when empowered with the necessary resources and flexibility, can make meaningful change for their neighbors and communities.

REFERENCES

Amin, A., Cameron, A. & Hudson, R. (2002). *Placing the Social Economy*, Routledge; https://doi.org/10.4324/9780203166123.

Armitage, D., Berkes, F., Dale, A., Kocho-Schellenberg, E. & Patton, E. (2011). "Co-management and the co-production of knowledge. Learning to adapt in Canada's Arctic," *Global Environmental Change. Symposium on Social Theory and the Environment in the New World (dis)Order*, 21:3, pp. 995–1004; https://doi.org/10.1016/j.gloenvcha.2011.04.006.

Brinson, A., Lee, M.-Y. & Rountree, B. (2011). "Direct marketing strategies. The rise of community supported fishery programs," *Marine Policy*, 35:4, pp. 542–548; https://doi.org/10.1016/j.marpol.2011.01.014.

Gerlach, S.C., Loring, P.A., Kofinas, G.P & Penn, H.J.F. (2018). "Human and social resilience in Bering, Beaufort, and Chukchi Sea communities," in *Adaptation Actions in a Changing Arctic. Perspectives from the Bering/Chukchi/Beaufort Regions*, eds. P. Outridge & L.D. Hinzman, Oslo: Arctic Monitoring and Assessment Program.

Loring, P.A. (2017). "Food (in)security and food sovereignty in the North," *Northern Public Affairs*, April 2017, pp. 56–59.

Loring, P.A., Gerlach, S.C. & Harrison, H. (2013). "Seafood as local food. Food security and locally caught seafood on Alaska's Kenai Peninsula," *Journal of Agriculture, Food Systems, and Community Development*, 3:3, pp. 13–30; https://doi.org/10.5304/jafscd.2013.033.006.

Pearce, T., Ford, J., Cunsolo Willox, A. & Smit, B. (2015). "Inuit traditional ecological knowledge (TEK), subsistence hunting and adaptation to climate change in the Canadian Arctic," *Arctic*, 68:2, pp. 233.

Southcott, C. (2015). *Northern Communities Working Together. The Social Economy of Canada's North*, Toronto: University of Toronto Press.

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Ian Peter Grohse, *Frontiers for Peace in the Medieval North. The Norwegian-Scottish Frontier c. 1260–1470*, Leiden: Brill 2017, ISBN 978-90-04-34253-8, 297 pp.

More than twenty years ago Steinar Imsen, then a teacher at the Norwegian University of Science and Technology, began to look at the history of the tributary islands, the "scatlands," of the realm of Norway. He assembled scholars in the international "Norgesveldet" project, published four volumes of papers by kindred enquirers (2010–2013), and eventually the beautiful collective volume *Rex Insularum* (2014), and his own elfin contribution, *Land og folk i den norrøne verda ca. 900 til 1450* (2015).

Imsen's younger colleagues included Randi Bjørshol Wærdahl, whose fine *Incorporation and Integration of the King's Tributary Lands into the Norwegian Realm c. 1195–1397* appeared in 2011. Now Ian Peter Grohse comes forward with a related study, about the experience of Orkney as part of the realm from 1266–1468. Together all these works have transformed our view of Orkney, and Shetland, and the other tributary lands in the Middle Ages.

Change was much-needed, especially with regard to Orkney. Until this century the shadow of Peter Andreas Munch loomed over our debates. "His ethno-national bias is pervasive," says Grohse, and that is to put it mildly. From P.A. Munch to Barbara Crawford, from Anton Brøgger to Gordon Donaldson (who liked to maunder about "race" and "southern blood"), events in Orkney were regarded as a "diametric" struggle between Scotland and Norway.

None of these historians understood that "nationalism" was a feature of the eighteenth rather than the fourteenth century, despite the huge amount of discussion about the matter by scholars in recent decades (see the walloping that Roger Mason handed out to William Ferguson on the subject in the *Scottish Historical Review*, 79, 2000, for a brief introduction). Grohse is not afflicted with the same ignorance.

His thesis is simple. He has found a limpid quotation by Jacob Grimm, from 1843: the border should "not be treated merely as a dividing, but rather also as a unifying principle from which, in addition to the necessary separation, a bond of contiguity and community unfolds." Grohse regards the "frontier" between Norway and Scotland—Orkney as a boundary of peace, rather than conflict. Those islands, he says, were "a frontier community allegiant to one monarchical state and allied with another," and the period from 1260–1468 "a successful and long standing experiment in cooperative frontier management."

It is an attractive proposition. It is, by the way, rather different from the one in the essay that Grohse contributed to *Rex Insularum* in 2014, "Defending country and realm. Military features and the Norse-Scottish frontier." At that point he envisaged more conflict. Now he sees a "deliberate strategy for promoting inter-state cooperation," and a "bond of contiguity and community" between the kingdoms. In this analysis Orkney is a "thoroughfare for peaceful discourse between political allies." It must be said that there is a lack of direct evidence for such cooperation, as Grohse acknowledges; but he makes a good case with the material available.

There are difficulties. Grohse argues that the scatlands were "extra-national entities." They "lay beyond the bounds of Norwegian society and demonstrated no ethnic or national affiliation to the mainland kingdom or its kings." This is problematical. It implies that there was nationalism in the two motherlands, but that for some reason Orkney wasn't afflicted by it. It is much more likely that all the medieval societies had the same characteristics.

In chapter 2 Grohse gets to grips with the Orkney earls, who have featured so prominently in the historians' accounts. They were certainly special. In 1308 Hakon V abolished baronial and earldom jurisdictions throughout the kingdom—"excepting for the sons of kings and the earls of Orkney" (*Diplomatarium Norvegicum*, 11, no. 6). According to Wærdahl and Grohse, the Orkney earldom, unlike others in the realm, had never been a threat to the unity of the kingdom. Moreover, the Orkney earls had had their wings clipped between 1195 and 1267. The downgraded earldom remained useful, or at least palatable, to kings on both sides of the border, whether the earls were natives or Scots.

In any case, the Imsen school is less interested in the earls than its predecessors have been. It "deemphasizes" the role of earls, and looks more closely at other actors in the society: royal governors and clerics, for instance. Grohse's chapter about the governors, building on and refocusing Crawford's work, is exemplary. Like the earls, the governors were often "foreigners." Grohse is willing to imagine that the kings were not conscientious enough in making some of these appointments—that the newcomers sometimes threatened "the foundations of public life in the isles:" David Menzies' uproar in Orkney in the 1420s is a good example.

The best chapter in the book is about bishops and their manœuvres. Munch, Crawford, and even Willie Thomson thought that after the Black Death the Orkney bishopric, staffed by foreign clerics, became a channel for malignant Scottish influences. Munch wrote balefully about Bishop William III, whom he regarded as a Scot, and thus, by definition,

"licentious." He did so by ignoring the extensive documents about William's career from the 1320s. Munch's campaign against the bishop is an extreme demonstration of his and others' crazy view that Orkney in the late middle ages was becoming "Scotticised."

Munch also had it in for William IV. He brooded about a problematical document of 1369 (*Shetland Documents* 1195–1587, no. 12), where the bishop came to an agreement with Hakon Jonsson, a royal governor. Munch assumed that William was an aggressive Scot, on a collision course with his Norwegian neighbours. Grohse, following Thomson, argues that in this case the issue between the two sides wasn't a "national" disagreement, but a dispute about the manipulation of *local* public institutions.

His account of Bishop William Tulloch, who assisted in the transfer of Orkney from Denmark to Scotland in 1468, is equally convincing. William was a mediator; not, as he has been portrayed, a traitor or dupe. The bishops' "itinerant careers," says Grohse,

> made them especially suited to negotiating the cultural dynamics of foreign diplomacy. Along frontiers, bishops were often preferred by kings to broker settlements that may have eluded more war-minded secular leaders.

There was sometimes strife, of course. In 1312, for instance, there was diplomacy between Hakon V of Norway and Robert I of Scotland, following "certain injuries, losses, and displeasures done to the men of the king of Norway" by Scots (*Records of the Earldom of Orkney*, no. 1). Later that century Earl Henry I killed his opponent Malise Sperra in Shetland. Munch gets into more trouble than usual about that, because both were Scots. In the fifteenth century "Wild-Scots" from the Hebrides attacked Orkney. Grohse's contention, however, is that these events were trivial and local rather than "national."

His explanation of the events of 1468, so often agonised about, is simple. "It was neither the outcome of a longstanding struggle between national kingdoms," he says, "nor a symptom of 'Scottification.'" He puts it down to the waning of Scandinavian interest in Orkney: "With grain as [Orkney's] principal commodity, revenues from the isles would have made hardly a splash." The union monarchs "were enthralled with aspirations of lordship in Northern Germany"—"honours which better appealed to their sense of grandeur on a European stage than did the comparatively pastoral archipelagos in the west." It's convincing.

And even then there wasn't strife. The local community wasn't disaffected from the new regime. In 1266, following the Treaty of Perth,

Alexander III introduced Scots law in the Hebrides and Man. James III didn't do that in Orkney after 1468. The change of monarchs

> did not compel Orcadians to portray themselves and their community as an extension or microcosm of the Scottish nation, nor to renounce their ties to Norway and the Norse world.

I spotted one howler in the book. When Grohse ventures into the early modern period he makes an awful error. Discussing "Earl Patrick I" (*sic*), he complains that that nobleman's "confiscation of the lawbook and communal seal" of Orkney "marked the beginning of the end of Norse law" there. He should have read Peter Anderson's *The Stewart Earls* (2012) more carefully. Patrick Stewart did no such things. In this single case Grohse has fallen into the same error that Munch and his successors committed again and again: he creates a fictional "national" commotion in Orkney.

I hope that the price of *Frontiers of Peace* doesn't discourage readers from becoming acquainted with the new history of medieval Orkney. Imsen, Wærdahl and now Grohse have rewritten the history of the tributary countries; the new version deserves to be better-known and discussed than the old.

REFERENCES

Anderson, P. (2012). *The Stewart Earls of Orkney*, Edinburgh: Birlinn.

Imsen, S. (ed.) (2014). *Rex Insularum. The King of Norway and his "Skattlands" as a Political System c. 1260–c. 1450*, Bergen: Fagbokforlaget Vigmostad & Bjørke.

Imsen, S. (2015). *Land og folk i den norrøne verda ca. 900 til 1450* ['Land and people in the Norse world, c. 900 to 1450'], Oslo: Samlaget.

Mason, R. (2000). "[Review of] *The Identity of the Scottish Nation: An Historic Quest* by William Ferguson (1998)", *Scottish Historical Review*, 79:2, pp. 240–242.

Wærdahl, R.B. (2011). *Incorporation and Integration of the King's Tributary Lands into the Norwegian Realm c. 1195–1397*, Leiden: Brill.

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Daniel Lindmark & Olle Sundström (eds.) 2016, *De historiska relationerna mellan Svenska kyrkan och samerna. En vetenskaplig antologi* 1–2, Skellefteå: Artos & Norma bokförlag 2016 (Forskning för kyrkan 33), ISBN 978-91-7580-795-9, 1,135 pp.; Daniel Lindmark & Olle Sundström (eds.), *Samerna och Svenska kyrkan. Underlag för kyrkligt försoningsarbete*, Möklinta: Gidlunds förlag 2017, ISBN 978-91-7844-975-0, 217 pp.; Daniel Lindmark & Olle Sundström (eds.), *The Sami and the Church of Sweden. Results from a White Paper Project*, Möklinta: Gidlunds förlag 2018 (Religion i Norrland 4), ISBN 978-91-7844-397-0, 255 pp.

The volumes discussed in this review—an 1,135-page two-volume "scientific anthology" authored by a variety of historians, theologians, and other scholars, along with a more succinct and synthetic summary volume published in Swedish (217 pp.), and with certain additions in English (255 pp.)—represent the fruits of a five-year white paper project aimed at describing the often problematic relations between the Lutheran Church of Sweden (and its Catholic predecessor) and members of the Sami nation. The project ran from 2012 to 2017, but grew out of earlier discussions that have their roots in broader processes of intercultural/postcolonial reconciliation that have occurred since the end of the Cold War and fall of the South African Apartheid regime. The notion of examining the relationships between Christian authorities and Sami people was first raised in the Lutheran World Federation Assembly, held in Brazil in 1990, and again in the World Council of Churches Assembly, held in Australia in 1991 (Lindmark & Sundström 2018: 26). The White Paper Project built on a dialogue (Ságastallamat) begun in 2011, co-organized by the Church of Sweden's theological committee and the Sami Council in the Church of Sweden, who met together in Giron (Kiruna) to discuss a framework for pursuing reconciliation. The ensuing project—funded by the Church of Sweden, with additional monetary and academic support from Umeå University—conceptualized its work with reference to Tore Johnsen's four-phase model of reconciliation, consisting of acknowledgement, repentance, restoration, and forgiveness (Lindmark & Sundström 2018: 26). The "scientific anthology" seeks mainly to contribute to the first phase of this process, documenting and interpreting the historical actions perpetrated by church officials or

institutions that proved traumatic or destructive to Sami people. The briefer and more synthetic later volumes summarize the findings of the original two-volume anthology, but also offer some reflections on ways in which the assembled materials can contribute to the three subsequent phases of reconciliation, namely repentance on the part of members or leaders of the Swedish church, restoration of the culture and welfare of an injured Sami nation, and possible Sami acts of forgiveness toward their former transgressors at the completion of the process.

The English volume noted above consists of three sections: 1) "A Summary of the Scholarly Anthology" (six chapters), written by Björn Norlin and David Sjögren; 2) "Perspectives on Reconciliation" (three chapters), written by Tore Johnsen, Carl Reinhold Bråkenhielm, and Sylvia Sparrock; and 3) "Concluding Reflections" (two chapters), written by Daniel Lindmark and Olle Sundström. The Swedish-language scientific anthology includes contributions from a number of the scholars mentioned above, as well as Karl-Johan Tyrberg, Carola Nordbäck, Gunlög Fur, Anna-Lill Drugge, Bo Lundmark, Siv Rasmussen, Håkan Rydving, Sölve Anderzén, Johan Hansson, Lars Elenius, Louise Bäckman, Anna Westman Kuhmunen, Rolf Christoffersson, Hans Mebius, Krister Stoor, Olavi Korhonen, Märit Frändén, Johannes Marainen, Gudrun Norstedt, Lars Thomasson, Lena Karlsson, Marianne Liliequist, Per Axelsson, Erik-Oscar Oscarsson, Maja Hagerman, Carl-Gösta Ojala, Roald Kristiansen, and Veli-Pekka Lehtola (contribution in English). The perspectives on reconciliation offered by Johnsen, Bråkenhielm, and Sparrock appear only in the Swedish and English summary volumes and are very valuable reflections for scholars interested in either postcolonial theology or the historical process of reconciliation unfolding in world religious and secular societies today. Where Johnsen and Bråkenhielm situate processes of reconciliation within a Lutheran Christian theological context—in which humanity is conceived as having received forgiveness from God and in which human beings are in turn enjoined to show forgiveness to one another—Sparrok offers perspectives on "ways forward" for Sami in relation to a Swedish church and state that in many ways continue to enact the colonial policies and attitudes identified and castigated in the scientific anthology's various articles. Sparrok points not only to continued structural racism affecting Sami livelihoods and resource rights, but also daily aggressions and microaggressions in which Sami are left to feel bullied, belittled, and beleaguered. Sparrok notes quite recent and painful instances of church decisions that give evidence of anything but support for Sami rights and equality, such as decisions not to take a stand in favor of ratification of ILO-169 or the UN Declaration on the Rights of Indige-

nous Peoples (Lindmark & Sundström 2018: 156–158), stands later reversed by church leaders, with Archbishop Antje Jackelén proving a particularly forceful and effective voice for Swedish admission of past wrongs and actions for achieving eventual reconciliation. The role of the White Paper Project in this complex and aching process is discussed in detail in the valuable final syntheses provided by Lindmark and Sundström in the English summary volume (Lindmark & Sundström 2018: 181–212).

Given that the purpose of the project is to document and discuss instances of injustice and oppression (albeit in a wider context of overall church–people relations that includes also positive relations and events), the anthology of articles and two summaries do a good job hitting on most of the most egregious historical misdeeds, either those consciously effectuated as the results of explicit policies of the church, or those in which church officials—clergymen, catechists, church-run school educators, etc.—perpetrated wrongs on their own, acting in what they believed was a manner consonant with the church's mandate and the spirit of Christianity. Instances include the suppression and punishment of traditions related to non-Christian beliefs ("idolatry")—sometimes including execution of people arrested for such deeds, particularly in the seventeenth and eighteenth centuries—the deleterious effects on language and culture of various schooling schemes throughout Sami colonial history, the complicity of church institutions in nineteenth- and twentieth-century archaeological and racial investigations that exposed Sami remains as well as living children and adults to various anthropometric investigations in the pursuit of evidence that would define Sami as different from (and inferior to) their non-Sami neighbors. Articles in the scientific anthology also explore the notion of reconciliation in its particular historical context in contemporary Sweden, as well as methodological and ethical issues.

It is beyond the scope of this brief review to discuss all the many fine articles assembled in the scientific anthology's two hefty volumes, apart from noting the overall high quality of the contributions, the impressive range of topics surveyed and explored, and the rigor and quality of the arguments presented. The anthology is certain to become a standard reference work for the study of Sami–church relations, not solely in Sweden, but also in the Nordic region more broadly. It is also certain to serve as a valuable benchmark for the international study of decolonizing processes between Christian church institutions and Indigenous communities, in the arctic region and throughout the postcolonial world. Particularly significant is the anthology's interrogation of the injurious effects of educational schemes, the examination of structural racism ev-

idenced in church conduct and policies over time, and the charting of various ways in which Sami people resisted colonization through both overt and covert actions, from steadfast refusals to abandon earlier ritual traditions, to subtle circumnavigation of child naming practices, to a quiet but pointed skepticism regarding the intentions and trustworthiness of various church institutions and representatives.

A somewhat surprising omission in the White Paper Project as broadly conceived was reference to those historical parts of the realm of Sweden that no longer belong to the Sweden of today, particularly Finland. Norwegian materials are frequently included in various articles and discussions, but Finnish materials are frequently omitted. As the English synthesis puts it, "the area is restricted to the part of Sápmi [...] that can be found within the borders of present-day Sweden" (Lindmark & Sundström 2018: 9). This logistic choice, of course, does an injustice to the topic, imposing a boundary to the actions of the Church of Sweden that did not obtain until the nineteenth century, and reinforcing in so doing the seeming salience of Nordic political borders that have never been of great importance to members of the Sami nation, except insofar as they inform different colonial regimes and systems of external control. The avoidance of Finnish materials is partly remedied in the Swedish scientific anthology by Veli-Pekka Lehtola's "Historical encounters of the Sámi and the church in Finland" (Lindmark & Sundström 2016: 1,085–1,120) which, since it is written in English, can serve an international readership as well as a Swedish one. It is partially summarized in the English summary volume (Lindmark & Sundström 2018: 81–84). An understanding of the important relations between Sami and Orthodox Christian authorities, which predominate on the Kola Peninsula and in some northern parts of what is today considered Norway and Finland, would also have been welcome, but the omission here can be justified more easily as not belonging within the parameters of a project focused on Western Christian church institutions. The anthology also explores the relations of Sami to other Christian religious movements in Sweden, such as the free church movement and Læstadianism.

While the White Paper Project overall outlines a further process of reconciliation that the current project may serve, it also leaves unstated some other avenues and ends for future reconciliation efforts. The challenge with any dialogue between religious cultures is to ensure that the terms and concepts that are the basis for the proposed dialogue adequately reflect the core values and conceptualizations of each polity. From the dramatically anthropocentric perspective of virtually all

forms of Christianity—in which the all-powerful maker of the entire universe is said to have chosen to become incarnate as a human being in particular and to hold out a special afterlife exclusively for human beings—it would seem natural to frame a discussion of the effects of the Swedish church in Sápmi on Sami people alone, with no reference to the plants, animals, lands, waters, or other beings that make up that place. Yet it can be argued that the Swedish church had a tremendous effect on Sápmi more broadly, particularly through the ways in which it discounted the sacrality of places, "inanimate" beings, and non-human sentient beings like animals, all of which played roles in the religious system that Sami people were consciously part of before missionization. These questions are raised deftly in some of the articles of the scientific anthology (e.g., the contributions by Bäckman, Westman Kuhmunen, Christoffersson, and Stoor), but are less prominently featured in the Swedish- and English-language syntheses (cf. English summary, Lindmark & Sundström 2018: 49–53). In echoing some of the findings of these insightful articles in the scientific anthology, consider what the great Sami intellectual Johan Turi (1854–1936) writes of his understandings of the Christian Last Judgment in his *Muitalus sámiid birra* ['An account of the Sami'], the first "secular" book ever written in Sami by a Sami author. He writes:

> Ja buores áiggis leat hupman visot eallit ja muorat ja geaɖggit ja visot mii gávdno eatnama alde, ja nu galget hupmat maŋinus duomu áiggi nai.
>
> ['And in the olden times all the animals and trees and rocks and everything found on earth was able to talk. And they will all be able to talk again at the Last Judgment'] (Turi 2010: 114; Turi 2012: 123).

Perhaps the next step in the wider process of acknowledgement, repentance, restoration, and possible forgiveness is for church institutions to consider the effects of their policies on other creations besides solely human beings: how did the missionization of Sápmi affect lands, waters, trees, animals—all of which played sacral roles in Sami religious practices before and during the missionary era? To what extent is the current world climate crisis a product of attitudes of "resource" exploitability enabled or justified by Christian interpretations of scriptures or theology? In a world in which Indigenous concepts are increasingly beginning to find reflection in state legal and social frameworks—such as Bolivia's 2009 Law of Mother Earth—it is intriguing and exciting to consider what the next steps may be for the Church of Sweden in acknowledging and possibly repenting the effects that its policies and

practices have had on all of Sápmi, including its human inhabitants. Given the seriousness with which the present white paper project was undertaken, it seems likely that the Church of Sweden may eventually pursue these questions—once aware of them—with the rigor and care that they so greatly deserve.

REFERENCES

Turi, J. (2010). *Muitalus sámiid birra*, ed. M. Svonni, Karasjok: ČállidLágádus.

Turi, J. (2012). *An Account of the Sámi. A Translation of Muitalus sámiid birra, based on the Sámi Original*, transl. and ed. by T.A. DuBois, Karasjok: ČállidLágádus.

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Heikki Pihlajamäki, *Conquest and the Law in Swedish Livonia (ca. 1630-1710). A Case of Legal Pluralism in Early modern Europe*, Leiden: Brill 2017 (The Northern World 77), ISBN 978-90-04-33153-2, 299 pp.

Livonia became part of Sweden through the Truce of Altmark in 1629. Before, it had belonged to Poland for almost 70 years but had been an arena of war (and of hunger and plague that came with warfare) from the middle of the sixteenth century onwards. Russia occupied the area from 1710 in the Great Northern War and it was annexed to Russia in the Treaty of Nystad (Uusikaupunki) in 1721. Pihlajamäki's main question is "what happened to Livonian law during this period of Swedish rule?"

In Sweden itself, the seventeenth century was a period of major change, mainly in the form of adopting features from Roman and learned professional law. Livonia, however, had been a part of the Holy Roman Empire until 1561 and therefore somewhat closer to German law. Pihlajamäki states that there was tension between the "unlearned" archaic law of the conquering Swedes and the learned law of Livonia.

Pihlajamäki uses this tension as the starting point of his book and investigates how far the Swedes tried to establish their own legal system in Livonia and to which extent they succeeded in it, or whether the Swedish legislation and legal system influenced the development of their Livonian counterparts during the Swedish reign.

The question of Swedish influence on the development of Livonian law is divided into three main areas: the judiciary, the procedure, and the legal sources. These also correspond with the structure of the book; the three areas get a chapter each after a background chapter on the state of the law and the legal system in Sweden and Livonia at the beginning of the period of study, and are followed by a conclusion which closes the book. Methodologically, the study, while concentrating on one area, claims to be situated in a comparative framework where the concepts of empire, composite state and colonization are important, albeit overlapping: as an early modern (colonial) empire or composite state, Sweden was prepared to let the legal order of the new territory take shape according to its particular needs.

The only way to find out about legal pluralism is to go to the archives. The bulk of the material used in the study comes from judicial archives—specifically those of the Lower Court in Tartu (Estonia) and the Dorpat High Court (or Court of Appeal, depending on emphasis) in Riga. Studies on legal scholarship form a background for the case materials, but, as Pihlajamäki states, since specifically Livonian legal scholarship did not exist until the nineteenth century, it is difficult to use legal scholarship to form a picture of early modern Livonian law. The same applies for legislation since the normative standing of written law was far less important than today, even though various statutes and ordinances tell us something about the legislators' aims.

Pihlajamäki concludes that the Livonian law and legal system were indeed very different from their Swedish counterparts at the beginning of the period. Livonian legal culture was more learned and more professional, and its links to German legal culture were stronger and remained so. Swedish law was rooted in the needs of the local peasant society whereas Livonian law had, under German influence, developed a more defined and socially more encompassing *gemeines Recht* or *ius commune*. Despite the more culturally developed side of the Livonian system, the practical judiciary in Livonia had largely been destroyed by the continuous and frequent wars by the time the Swedes occupied the country. Therefore, unlike many other early modern empires, Sweden felt an urgent need to reform the Livonian judiciary. The intention at that point was, according to Pihlajamäki, to make the new Livonian

system as similar to the Swedish one as possible, but local circumstances posed limits to this aim. Where it failed in practice, was at Livonian lower courts (*Landgerichte* in Livonia, *häradsrätter* in Sweden). Whereas in Sweden the land-owning peasants formed an essential part of the agency involved—as accusers, plaintiffs, witnesses as well as defendants—in Livonia there were simply not enough free peasants to form such agency. Therefore, the *Landgerichte* came to be considerably more dominated by noble judges who decided which other groups were heard and represented in legal decision-making. Peasants usually appeared only as defendants in criminal cases. The High Court in Dorpat was established in 1630 with Swedish, German and Livonian judges but the proportion of Swedish judges remained low. Although half of the posts were allocated to noblemen, at least they were often men with some legal training.

The structure of the judicial system itself remained unchanged during the Swedish era but the legal procedures changed. In criminal procedure, official prosecutors and the inquisitorial procedure became more common by the end of the seventeenth century. Judicial torture was renounced and the accusatorial procedure remained in a dominant position especially when the accused was not a peasant. Pihlajamäki discusses the commonly held scholarly opinion that this was largely what happened in other parts of Europe, too, but concludes that without a thorough archival study (in addition to studies based on legal literature), large gaps in knowledge make it impossible to determine what other procedural modes were in use in different areas of Europe. While Pihlajamäki is correct here, there might be a considerable number of studies conducted by non-legal historians of crime, administration and society that could be used for such an evaluation. However, the sheer volume of material and the multitude of languages they are presented in may turn out to be a challenge to a systematic comparison.

Pihlajamäki also points out that references to legal literature and legal sources are rare and suggests that this problem can be approached differently in Livonia than in either the continental heartlands or in Sweden proper. In the small and relatively coherent area of Livonia, it was not necessary to discuss legal sources in the same way as in the German area. On the other hand, Livonian discussions seem more open and less dependent on statutory law than Swedish ones. In sum, Pihlajamäki concludes that Swedish law acquired a limited influence only in Livonia during the eight decades of Swedish rule. The book also demonstrates how the Swedish state as a whole was far from homogeneous—vertically across geographies as well as horizontally across

classes and estates—and how it was being influenced from various directions.

There are a number of typographical errors in the book such as the claim on page 2 that the Academy of Turku was established in 1630 (it was established in 1640). In general, however, the book is written in a clear and accessible language, its structure is simple and there is a helpful index at the end of the book. It is a recommended read.

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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" ['Walrus ivory and the Norse colonies of Greenland'], *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" ['Naming traditions among the Bashkirs'], *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 2007*a*, 2007*b*, 2007*c* etc.:

Simmons, I. G. & Innes, J. B. (1996*a*). "An episode of prehistoric canopy manipulation at North Gill, North Yorkshire, England," *Journal of Archaeological Science*, 23, pp. 337–341.

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