

The 'Last Ice Age' in maritime history: An introduction

Norseng, Per G

Department of Business, History and Social Sciences - University of South-Eastern Norway
Norwegian Maritime Museum - Museer

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'The Last Ice Age' in maritime history: an introduction (preprint)

Per G. Norseng

Norwegian Maritime Museum
Bygdøynesveien 37
0286 Oslo
Norway

University of South-Eastern Norway
PO Box 235
3603 Kongsberg
Norway
Per G. Norseng@usn.no

Abstract

The point of departure of this *IJMH* Forum is an ongoing research project funded by the Research Council of Norway: 'The Last Ice Age: The trade in natural ice as an agent of modernization and economic integration in nineteenth and early twentieth century' (<https://marmuseum.no/en/the-last-ice-age>). The project is managed by the Norwegian Maritime Museum in cooperation with scholars at the University of South-Eastern Norway, the University of Hull (UK), and Old Dominion University (Norfolk VA, USA). This paper outlines and contextualises the development of Norway's natural ice trade, thereby introducing the project and setting the scene for the five other papers that comprise this Forum.

Keywords

ice trade, food logistics, fisheries, cooling technologies, Norway, Europe

Cold storage preserves the freshness of food and provides cold drinks and ice creams. From ancient times to the late nineteenth century, snow or ice collected and stored in the winter was the only source of cooling energy available in the warm seasons.¹ In industrialized societies, especially from the 1870s onwards, this ancient method co-existed with modern cooling and freezing technologies for several decades, with artificial cooling only gradually getting the upper hand, in most places, towards the First World War; in some places and industries, however, natural ice was not superseded until the interwar or even the post war period.²

¹ See, for example, Adrian W. Reinink and Johan G. Vermeulen. *Ijskelders: Koeltechnieken van weleer* (Groningen, 1981); Sylvia P. Beamon and Susan Roaf, *The Ice Houses of Britain* (London, 1990); Elisabeth David, *Harvest of the Cold Months: The Social History of Ice and Ices* (London, 1996); Ada Acovitsióti-Hameau, 'La glace dans la vie quotidienne ou les nuances du confort: exemples de l'Europe et de la Méditerranée', in *Journées d'Etudes du Pôle Universitaire Européen de Montpellier, Perpignan, Novembre 1997* (Perpignan, 1997), 133-51.

² See, for example, Reinink and Vermeulen, *Ijskelders*; Jonathan Rees, *Refrigeration nation: a history of ice, appliances, and enterprise in America* (Baltimore, 2013); Jonathan Rees. *Before the refrigerator: How we used*

Over the years, a considerable amount of scholarly, as well as popular science, literature has been produced on the social and cultural history of ice and different aspects of the modern trade in natural ice in the USA and Europe.³ In recent years, notably, some seminal works have been published in the USA on the different new ‘cold chains’ that were created by the growing use of ice for cooling, revolutionizing the food industries and food logistics, and dramatically changing eating and drinking habits.⁴

However, although much has been published on the modern trade in natural ice and the use of ice for cooling in northern and western Europe, in particular on the Anglo-Norwegian ice trade,⁵ important aspects of the ‘Last Ice Age’ in this part of the world has so far been under researched. This includes the modes of operation in the overseas trade in ice, where Norway during the second half of the nineteenth century became a dominant supplier, as well as the use of ice in many food industries and in railway and ship transport of perishable foods and drinks in the importing countries, and the dynamics between locally produced natural ice, imported ice, artificially produced ice and artificial cooling in the technological development of old and new cold chains.

‘The Last Ice Age: The Trade in Natural Ice as an Agent of Modernization and Economic Integration in the Nineteenth and Early Twentieth Century’ is an ongoing research project funded by the Norwegian Research Council. The project is managed by the Norwegian Maritime Museum in

to get ice (Baltimore, 2018); Paula Schönach, ‘From Now on We All Demand: *Give Us Pure Ice!*’ – Natural and Artificial Ice in the Service of Food Hygiene in Nineteenth- and Twentieth-Century Helsinki, Finland’, *Environment and History*, (2019), 1-29; Paula Schönach, ‘Natural Ice and the Emerging Cryopolis: A Historical Perspective on Urban Cold Infrastructure’, *Culture Machine*, 17 (2018); Per .G. Norseng, ‘Fersk fisk og kald pils i den siste istid. Om naturisens rolle i kystøkonomien og det moderne gjennombruddet i Norge’, *Heimen*, 56 (2019), 214-37; Jan Thomas Kobberrød, ‘Bruk av naturis i norsk ferskfiskomsetning, 1860–1940’, *Mennesket og havet, Årbok Norsk Maritimt Museum 2019* (Trondheim (2020), 61-91.

³ For example, Richard O. Cummings, *The American Ice Harvest* (Berkeley, 1949); D.V. Proctor, ed., *Ice Carrying Trade at Sea* (London: National Maritime Museum Monographs and Reports no.49, 1981); Gøthe Gøthesen, *Med is og plank I Nordsjøfart* (Oslo, 1986); Máiréad M Johnston, *Ice and Cold Storage – A Dublin History* (Dublin, 1988); David D. Dickason, ‘The Nineteenth Century Indo-American Ice Trade: An Hyperborean Epic’, *Modern Asian Studies*, 25 (1991), 53-89; Robert David, ‘The Demise of the Anglo-Norwegian Ice Trade’, *Business History*, 3 (1995), 52-69; Gavin Weightman. *The Frozen Water Trade: How Ice from New England Kept the World Cool* (London, 2003); Carl Seaburg and Stanley Paterson, *The Ice King: Frederic Tudor and his Circle* (Boston, 2003); Bodil B. Blain, ‘Melting Markets: The Rise and Decline of the Anglo-Norwegian Ice Trade, 1850-1920’, *Economic History Working Papers 22471* (London School of Economics and Political Science, 2006); Hans-Jørgen Wallin Weihe and Carsten M, Syvertsen, *Den norske iseksporten: The Frozen Water Trade* (Stavanger, 2012); Per G. Norseng, ‘Naturisen i norsk sjøfartshistorie’, in Elisabeth S. Koren and Frode Kvalø, eds., *Hundre år over og under vann: Kapitler om maritim historie og maritim arkeologi i anledning Norsk Maritimt Museums hundreårsjubileum* (Oslo, 2014), 153-92 with further references; see also notes 2-3 above.

⁴ Susan Freidberg, *Fresh: A Perishable History* (Cambridge MA, 2010); cf Rees, *Refrigeration nation*; Rees, *Before the refrigerator*.

⁵ See note 3 above.

cooperation with partners at the University of South-Eastern Norway, the University of Hull (UK) and Old Dominion University (Norfolk, VA, USA), and individual scholars elsewhere.

The overarching aim of the 'Last Ice Age' project hence is to enhance knowledge and understanding of the scale, character, organisation and significance of the natural ice business during the late nineteenth and early twentieth centuries, focusing on northern and western Europe. The overseas ice trade is being analysed in the wider contexts of transport history, technological and logistical developments, economic integration, changes in consumer patterns and environmental factors during this era.⁶

This is a many-faceted story and indeed a vast territory to cover. In this *IJMH* Forum, five of the project's researchers present some of their findings, highlighting issues that are especially relevant for maritime history: natural ice as a 'commodity chain' linking areas of production and consumption over seas; the distinctive structures of Norwegian ice exporting firms; the emergence of shipping conferences in the sail and steam sectors of Norway's ice export business; protectionist propaganda campaigns designed to limit imports of Norwegian ice into northern France; and the tensions that arose in Germany as artificial ice makers argued vehemently that their product was cleaner, safer and cheaper than natural ice imported from Norway, but neglected to mention the key environmental point that their ice-making equipment was powered by finite fossil fuels, whereas their competitor, whether from Norway or elsewhere, was a naturally occurring sustainable resource.

Ice from luxury to staple item

Using ice for cooling was not a novelty in the nineteenth century. Long before our era, in the civilizations around the Mediterranean, in the Middle East and Asia, snow and ice were collected in the mountains and stored in ice cellars or ice houses for the production and cooling of food and beverages. In southern France and Italy, a regional ice trade emerged from the end of the Middle Ages, linked to a growing market in cities such as Marseille, Toulon and Naples.⁷

The use of snow and ice for such purposes was in pre-industrial society mainly an upper-class phenomenon. An early exception may have been the relatively egalitarian community of citizens in

⁶ See project description at <https://dms-cf-02.dimu.org/file/02349wm4N5AZ> (accessed 19 January 2022).

⁷ For example, Reinink and Vermeulen, *Ijskelders*, 45-61; Beamon and Roaf, *Ice Houses of Britain*, 7; Jill Norman, 'Introduction', in David, *Harvest of the Cold Months*, xi-xii; Acovitsióti-Hameau, 'La glace dans la vie quotidienne'; Melissa Calaresu, 'Making and eating ice cream in Naples: Rethinking consumption and sociability in eighteenth century Naples', *Past & Present*, 220 (August 2013), 35-78.

ancient Athens.⁸ And in the southern Italian city of Naples, snow and ice were by the end of the eighteenth century considered a necessity in relatively broad sections of the population, and were, among other things, used in numerous coffee and ice cream parlours. We also know this to have been the case in Rome in the early 1800s. To the astonishment of visiting observers from northern Europe, sorbets and ice creams were even sold on the streets of Naples in the second half of the eighteenth century and were thus accessible to virtually all classes of society.⁹ However, this relatively widespread and rather 'democratic' use of ice for cooling does not, on the other hand, seem to have been reflected in other economic spheres in the Mediterranean world, like the trade in fish and other foods, in this epoch. In fact, sceptical attitudes towards the idea of using ice for preserving fresh fish were long lasting in those parts.¹⁰

Ice houses and ice cellars are also known north of the Alps from the Late Middle Ages and became quite widespread on royal and aristocratic estates in early modern times. They were, however, probably for a long time mostly restricted to aristocratic households in town and countryside in these more temperate parts of Europe. Sorbets, ice creams, soufflés, chocolates, cakes, cold drinks and the like became part of the upper-class culture in the seventeenth and eighteenth centuries.¹¹ Even on a fringe of Europe like Norway this fashion arrived, probably with Danish officials. The oldest known mention of an ice cellar is from the Danish governor's residence in Larvik in 1688. From the eighteenth century, ice houses or ice cellars have been documented in numerous Norwegian mansions, vicarages, etc.¹²

In large northern and western European cities, this pre-industrial and somewhat luxurious use of ice for cooling could assume a scale that formed sufficient basis for local or even regional trade. For example, a few years ago an enormous underground ice cellar from the 1780s was excavated in London. It has such dimensions that it must have been built for commercial purposes.¹³

⁸ Norman, 'Introduction', xi-xiii; David, *Harvest of the Cold Months*, 55-140.

⁹ Calaresu, 'Making and eating ice cream in Naples', 57-78; David, *Harvest of The Cold Months*, 141-88.

¹⁰ For example, Solfrid K. Surland, 'Ice as an agent of change in a colonisation project: Norwegian ice to Algeria in the nineteenth century' (Unpublished MA thesis, University of Oslo, 2021), 19-21.

¹¹ See for example, Reinink and Vermeulen, *Ijskelders*, 63-127; Beamon and Roaf, *Ice Houses of Britain*; David, *Harvest of the Cold Months*, 310-28.

¹² Norseng, 'Fersk fisk og kald pils i den siste istid', 220.

¹³ Sarah Murdon, 'William Leftwich and the Ice Well', All things Georgian, 17 January 2019. https://georgianera.wordpress.com/2019/01/17/william-leftwich-and-the-ice-well/?fbclid=IwAR1NTpHBp_LT8LDbwq3Oosm5p7eSqmk93I-zgMu4Oo566Z-82SoWDHE6f0E (accessed 19 January 2022).

And an author from Austria who visited St. Petersburg in 1835, claimed that there were no less than 10,000 ice cellars in the city, with many private households apparently using ice for cooling.¹⁴

Summers were short, but could be very hot even in these parts. And winters were cold. In the Russian capital, there was ample access to both snow and ice from the Neva River. The extensive use of ice for cooling did not, therefore, prompt long-distance trade in ice. Neither did any use that peasants here, or in other Northern countries, may have had for ice and snow to preserve fresh food. And even in London, it appears that demand could until the mid-nineteenth century normally be covered by ice and snow collected locally. But there, for climatic reasons, the supply situation was more precarious even before ice became a staple commodity.¹⁵

Under the headline 'Trade speculation with Norwegian ice', the Norwegian newspaper *Morgenbladet* reported on 11 August 1822 that the English ship *The Spring* from Yarmouth, which had sailed to Norway on 17 March, had taken on board nearly 300 barrels of ice in an unnamed place some 100 miles north of Trondheim. 'Mr. Leftwich, confectioner in London' had chartered the ship, and on 8 May 1822 he arrived on the Thames with his ice cargo. He experienced major problems with customs clearance because ice was not an item in the customs tariff. Finally, he was charged a discretionary duty of 20 per cent of the value (however that may have been calculated) and was allowed to unload the ice. According to the newspaper, it was sold at an enormous profit. Allegedly there had been no snow or ice to be seen in London between October 1821 and May 1822, which had put all confectioners and fishmongers in the city in dire straits. They now flocked in large numbers to buy the ice that Leftwich had brought from Norway. He could, therefore, sell it in small and very expensive portions.¹⁶

The small notice in the *Morgenbladet* in the summer of 1822 illustrates how ice had become an important commodity in the city of London at that time. In the same year, ice was imported from the Greenland Ocean as well. This had also occurred sporadically in previous decades. But still, demand had normally been covered by snow and ice that could be collected more locally in the winter and stored for later use. In times of scarcity, ice was probably also transported from the Highlands of Scotland.¹⁷ However, the winter of 1821/1822 had been particularly mild and created a great need to import ice.¹⁸

¹⁴ David, *Harvests of the Cold Months*, 294-7.

¹⁵ See David, *Harvest of the Cold Months*, 310-37.

¹⁶ *Morgenbladet*, 11 August 1822; cf. David, *Harvest of the Cold Months*, 332-4.

¹⁷ David, *Harvests of the Cold Months*, 321-36.

¹⁸ See also, William Paulin, 'An account of the several days in each winter on which the Berwick Shipping Company's Stock of Ice was laid in, from the year 1821 to 1845', in *A History of Berwickshire Naturalists' Club* (Berwick-upon-Tweed, 1849), 144.

Although Leftwich was probably the first person to import ice to London from Norway, we cannot rule out the occasional arrival of Norwegian ice to other British ports in the preceding years. More importantly, this incident is a reminder that not only London's confectioners, but also the local fishmongers, needed ice. This is an indication of what was to come for Norwegian ice exports. In the following decade, there were individual reports of imports of ice to Britain from Greenland, Iceland, the Faroe Islands and Norway.¹⁹ The British Treasury apparently from 1822 onwards granted tariff exemption for ice imported for the fisheries.²⁰ Ice had been used since the 1780s to transport fresh salmon from Scotland to London, instead of salting it as before.²¹

From now on, ice was gradually being used for more everyday purposes, and as industrialisation proceeded became an important factor in a sweeping logistics revolution that in the second half of the nineteenth century changed the eating and drinking habits of broad sections of the population in the industrialized parts of the world and led to increased economic integration.²² Fredrik Wallem, a Norwegian journalist and very keen advocate for ice in the fishing industries, commented on this process while reporting from an international fisheries exhibition in London in 1883. He described the situation in the ice market as follows: 'For fishmongers, butchers, dairies, breweries, confectioners, hotels, passenger steamships, etc. in most countries it has become necessary to have an even supply of ice [...]. In the modern household, ice has become indispensable.'²³

Wallem was probably exaggerating the proliferation of ice in average households, but this enthusiastic contemporary report nonetheless illustrates how using ice for cooling had become a cornerstone of modern urban life in western and northern Europe. He might have added that ice was also being used for pain relief in hospitals as well as for cooling chemical and other processes in industries.²⁴

The rise of the overseas trade in ice in Europe

In 1822, Norwegian newspapers reported on other British ships that came to Norway on the same errand as Leftwich and *The Spring*. Two of these sailed via Bergen south to the Hardanger fjord and

¹⁹ David, *Harvests of the Cold Months*, 325-6; Iain A. Robertson, *The Tay Salmon Fisheries since the Eighteenth Century* (Glasgow, 1998), 41-7.

²⁰ David, *Harvests of the Cold Months*, 334-6.

²¹ David, *Harvests of the Cold Months*, 325-6; Robertson, *Tay Salmon Fisheries*, 41-7.

²² For the USA, see, for example, Rees, *Before the refrigerator*, vii-x, 61-77.

²³ Fredrik Wallem, *Den internasjonale Fiskeriudstilling i London 1883: Beretning til Selskabet for de norske Fiskeriers Fremme* (Bergen, 1885), 256-7; see Kobberrød, 'Bruk av naturis i norsk ferskfiskomsetning', 61.

²⁴ See, for example, Wallin Weihe and Syvertsen, *Den norske iseksporten*, 112, 164.

fetched ice from the Bondhus glacier. Local peasants were hired to carry the ice on their backs from the mountains to the fjord. One ship was going to London. The local vicar Niels Hertzberg in Ullensvang, who wrote about this in *Morgenbladet* three years later, reported that the ice was intended for the confectioners there. The other ship is particularly interesting in our context because the ice was allegedly heading for Scotland to be used in the transport of the fresh salmon to London.²⁵ Moreover, the same applies to two Scottish ships according to a notice in another Norwegian newspaper, *Den Norske Rigstidende*. On 20 May 1822, it reported that these ships called into a fjord northeast of Bergen to fetch ice from the mountains there for use in the salmon trade.²⁶ The mild winter of 1821/1822 was obviously a problem for the Scottish salmon traders as well.²⁷

When William Leftwich sailed to Norway for ice in 1822, he used barrels to convey the ice. This packaging was probably well adapted to the kind of ice harvests that he knew from England, where the ice did not settle particularly thickly on rivers, ponds and lakes. But at that time, the American businessman Frederic Tudor had conducted long-distance trade in ice from New England for almost two decades, at first to the southern states of the USA and the Caribbean. This was the start of a more permanently organized mass production of natural ice. Tudor and his successors gradually developed various specialized tools and methods to handle the ice on the way from the lakes in the northeast to consumers. The ice was cut into large blocks and transported in bulk. Eventually the growing metropolis of New York became a dominant market, but ice was also shipped from New England to South America, Southeast Asia and Australia.²⁸

Shipments of ice from the United States to Britain commenced in the late 1840s. The North American ice was effectively marketed as very clean. So-called 'Wenham Lake' ice became a brand that enjoyed a niche market in the UK for a very long time.²⁹ Nevertheless, it was the Norwegian ice that from now on was gradually to dominate the British import market for ice, as well as other northern and western European markets.

Ice exports 'the American way'

²⁵ *Morgenbladet*, 4 October 1825.

²⁶ *Den norske Rigstidende*, no.40, 20 May 1822.

²⁷ Paulin, 'Account of the several days', 144.

²⁸ See, for example, Reinink and Vermeulen, *Ijskelders*, 129-42; W.J. Lewis Parker, 'The East Coast Ice Trade of the United States', in Proctor, *Ice Carrying Trade at Sea*, 1-2; Weightman, *Frozen Water Trade*; Seaburg and Paterson, *Ice King*; David, *Harvests of the Cold Months*, 288-94; Rees *Refrigeration nation*; Rees., *Before the refrigerator*, 8-25.

²⁹ For example, Reinink and Vermeulen *Ijskelders*, 92; David, *Harvests of the Cold Months*, 278, 325, 342-3, 346-7.

The Reverend Hertzberg in Hardanger envisioned that ice exports would become an important industry for the locals in his district, although in the years after 1822 shipments of Norwegian ice were sporadic, for it was mostly after extra mild winters that the British needed to import ice. But in 1825, Dutch vessels allegedly called on Risør, a port on the Skagerrak coast, to fetch ice for France. And from the 1830s, the rapidly growing Norwegian merchant fleet joined the ice traffic. In 1835, according to official statistics, an export of 1,310 register tons of ice from Norway was customs cleared. This corresponded to perhaps five or six shiploads.³⁰ And in the spring of 1846, after another mild winter in Britain, no less than 12 Norwegian ships were reported to have been chartered to carry ice to English ports.³¹

Although attempts were also made later to make a profit from exporting glacier ice from western Norway, this proved to be a dead end for the emerging ice trade. Exports from this time on took place mainly from southeastern Norway.³² Here, the winters were colder in the lowlands, compared to western Norway. The ice normally settled thickly on ponds and lakes, even in coastal areas, virtually on the shores or in the immediate vicinity. Consequently, conditions were better suited for efficient production and shipping of ice ‘the American way’, the logistics of transporting the ice to the harbours less complicated and less costly, and the distance to the most important markets shorter.

In some cases, during these years, ice was shipped all the way to Portugal and even to the Mediterranean; for example, a single cargo was carried to the French colony of Algeria in 1839.³³ In the second half of the nineteenth century, although some ice went to ports elsewhere in the Mediterranean, and even the Black Sea, Algeria became the most important southern recipient of Norwegian ice. More exceptionally, Norwegian ice was shipped to Iceland, the Faroe Islands and far into the Baltic Sea to Finland and Russia. Between 1880 and 1890, a number of cargoes were also sent to New York,³⁴ and we know of individual cases where Norwegian ice was exported to more exotic areas such as the Red Sea, Congo, Cuba, Burma and Batavia.³⁵

³⁰ See Jacob S. Worm-Müller, ‘Fra klipperen til motorskipet. Verdenskrigen’, *Den norske sjøfarts historie fra de ældste tider til vore dager*, vol II:1 (Oslo, 1935), 688; Gøthesen, *Med is og plank*, 122; Norseng, ‘Fersk fisk og kald pils’, 219.

³¹ *Morgenbladet*, 25 March 1846; David, *Harvests of the Cold Months*, 344.

³² Ouren, *Norwegian Ice Trade*, in Proctor, *Ice Carrying Trade*, 37.

³³ Surland, *Ice as an agent of change*, 43-4; Norseng, ‘Fersk fisk og kald pils’, 219.

³⁴ Worm-Müller, ‘Fra klipperen til motorskipet’, 688-705; Surland, *Ice as an agent of change*, 35-6; *Norges Sjøfartstidende*, 20 February 1895.

³⁵ Worm-Müller, ‘Fra klipperen til motorskipet’, 695-6; *Akershus Amtstidende*, 30 July 1887, 18 July 1888; *Morgenbladet*, 7 April 1878; *Morgenbladet*, 27 April 1878.

However, ships with Norwegian ice primarily and most regularly sailed across the North Sea and other nearby waters. When ice exports were established as a large and well-organized industry in the second half of the nineteenth century, London, the fishing ports on the east coast of England and other ports in the British Isles were usually the most important and stable markets. The rest of the exports were mostly distributed to ports in northern and western Europe, especially in Germany, the Netherlands, Belgium, western France, Sweden and Denmark. On the continent, the German market for natural ice was notably extensive, but it was largely supplied by domestic production as well as ice from Norway.³⁶

From the 1850s, a domestic market for ice also emerged in Norway. Ice was to some extent used in the Norwegian fisheries, first to a limited extent for the urban fresh fish markets, from the 1860s also for export of fresh fish, initially mostly mackerel and salmon, later especially for the export of herring. By the late 1850s, a nascent market for ice had also emerged in other industries, and in private households in Christiania (Oslo) and other cities.³⁷ But compared to the USA, Britain and the countries on the continent, the domestic market was more limited, both for climatic reasons and due to a weaker and later urbanization and industrialization. Moreover, in spite of a considerable export trade, the Norwegian fisheries were late with a major transition to the export of fresh fish.³⁸

Consequently, it was the foreign ice markets, especially in Britain, that initially stimulated the expansion of the Norwegian ice business into a regular and well-organized trade. 'Following' the ice from Norway, as Atkinson suggests in this Forum, we can see that the growing London ice market was always important. What at an early stage may have triggered the rise of Norwegian ice exports even more, however, is the growing market for fresh fish both there and in other cities in Britain from the 1840s; the corresponding expansion of the British trawler fleet; and the innovative practice of bringing ice to the fishing banks, allowing the catch to be put on ice immediately and kept chilled and fresh on the voyage back to the fishing ports, and from there by railway to London and other urban markets. This made fresh fish available to broader sections of urban society – often sold as fried fish in the streets to working class people and eventually accompanied by French fried potatoes as 'fish & chips'. The early development of railways in the UK is obviously a key factor. But it is no less obvious that this technological shift in the fisheries and the fish trade could not have taken place at such an early stage without growing imports of natural ice, mainly from Norway.³⁹

³⁶ See Ouren, 'Norwegian Ice Trade', 36.

³⁷ Kobberrød, 'Bruk av naturis i norsk ferskfiskomsetning', 61-91; Norseng, 'Fersk fisk og kald pils', 230.

³⁸ For example, Norseng, 'Fersk fisk og kald pils', 230-1.

³⁹ See Robb Robinson, *Trawling: The Rise and Fall of the British Trawl Fishery* (Exeter: University of Exeter Press, 1996), 23-33, 69-71; Karl E. Johansen. 'Nye tider på sjø og land, 1880-1920', in Nils Kolle, ed., *Norges fiskeri- og kysthistorie*, vol bind III, (Bergen, 2014), 30-1.

From harvesting Nature's gifts to cultivating natural ice

The trade in Norwegian natural ice started with harvesting an abundant natural resource, but as this resource was commodified, the ice business developed into a complex logistical and commercial operation. To meet the growing demand for ice, from about 1860 a considerable infrastructure emerged in the major exporting areas. Artificial ice dams were built to extend the surface from which ice could be harvested. This amounted to a transition from merely harvesting what Nature offered to cultivating ice. Huge store houses were also erected to enable the ice merchants to distribute the exports throughout the year, and thus to some extent adjust to seasonal changes in demand and prices in a very volatile and speculative market, and even store ice from one year to another. Often transport from the ice ponds and lakes was enhanced by the construction of wooden railways or ice slides, sometimes more than a kilometre long, to save manpower and horsepower and instead make gravity do the job of moving the heavy ice blocks to the quays. Moreover, as shown in the papers by Bagle and Nygaard in this Forum, the natural ice business also involved complicated ownership structures and legal issues, a huge fleet of ships employed temporarily or on a permanent basis in the ice trade, and great technical and commercial know-how.⁴⁰

By the end of the nineteenth century, natural ice was one of Norway's most important export commodities, next to fish and lumber. In 1898, the total export was almost 554,000 register tons or c. 1.5 million metric tons. The average for the 1896-1900 was close to 442,000 register tons. Thousands of people and hundreds of ships were involved in the ice export.⁴¹ The overseas transport was at this time mainly carried by Norwegian ships, but foreign ships were also involved. Most of the ice carriers were still wooden sail ships. Steam ships were only very gradually introduced from the 1870s, notably from the 1880s, but they did not surpass sail ships in export volume of ice until 1911 (see Nygaard's paper).⁴²

Norwegian vs. North American and Baltic ice

Why Norway, and not the USA, became the main overseas exporter of ice to Britain and other countries in northern and western Europe, is easy to explain in terms of distance to the markets and transport costs once the American way of harvesting ice was adopted. But the ice trade did not develop in Sweden, Finland or Russia – why not?

⁴⁰ Norseng, 'Fersk fisk og kald pils', 220-8; Gøthesen, *Med is og plank I Nordsjøfart*, 127-63.

⁴¹ Ouren, 'Norwegian Ice Trade', 35; Norseng, 'Fersk fisk og kald pils', 215, 227.

⁴² Ouren, 'Norwegian Ice trade', 40; Norseng, '*Naturisen I norsk sjøfartshistorie*', 165-81.

Oslo, Stockholm, Helsinki and St. Petersburg are approximately on the same latitude. Conditions for growing natural ice are even better along the northern shores of the Baltic than in south-eastern Norway. And as in Norway, even in the post-1945 period, natural ice was harvested for domestic markets in, for example, Helsinki and Stockholm, and also used in the fishing industries on the western and southern coasts of Sweden.⁴³

The ice business is far less researched in these areas than in Norway. We know, admittedly, that newspapers reported of substantial amounts of natural ice being exported from Sweden in 1884, for example from Stockholm and Luleå on the Gulf of Bothnia.⁴⁴ But this is clearly not representative, for 1884 was a year of great ice famine and extraordinarily high imports in Germany and the British Isles due to a mild winter. In Norway, therefore, ice was harvested for export not only in coastal areas, but was also being transported overland by railway from lakes in the interior with lower winter temperatures to satisfy the growing demand and profit from high prices.⁴⁵ The same applies to reports of ice exports from the northern Baltic region in 1898, when demand for imported ice was exceptionally high in the German and British markets due to periods of very mild weather during the winter, and Norwegian ice merchants experienced very serious difficulties in providing sufficient ice to satisfy their foreign customers. This caused extensive speculation. Ice resources in the interior that were normally not exploited for export, were again mobilised at great extra costs in manpower, railway and river transport etc. By the same token, according to a Norwegian shipping newspaper, in this year for the first time ice was exported from the northern Baltic region to Western Europe.⁴⁶

All this makes sense – under more normal circumstances Norwegian ice and Norwegian ice merchants, because of shorter distance and lower transport costs to the markets in the North Sea area, would have an obvious comparative advantage. Shorter sailing seasons due to the ice conditions in the Baltic may also be added. At the same time, the ice markets in the southern Baltic, which were closer to Finland and Sweden, were in most years probably too small for producers and traders there to build up the kind of physical infrastructure, business networks and expertise that would have been necessary to compete with Norwegian ice exporters.

⁴³ See Schönach, 'From Now on We All Demand'; Schönach, 'Natural Ice and the Emerging Cryopolis'; Arne Liljemark and Henrik W. Aas, *Naturis og konstis till kylning av fisk* (Göteborg: Svenska Institutet för konserveringsforskning, Rapport nr. 52, 1958); Gunvor Vretblad, 'Djupfryst', in *Mat. Fataburen: Nordiska Museets och Skansens Årsbok* (Stockholm, 1989), 145-8.

⁴⁴ *Morgenbladet*, 20 April 1884; *Halden*, 1 May 1884; *Fedrelandsvenden*, 23 April 1884.

⁴⁵ See Ouren, 'Norwegian Ice Trade', 36; Harald Hals, *Eidanger bygdehistorie* bind II (Porsgrunn, 1968), 139; *Vestlandske Tidende*, 8 January 1884; *Bergens Aftenblad*, 8 January 1884; *Ugeblad for Fredrikstad og omegn*, 9 January 1884; *Nordre Trondhjems Amstidende*, 15 January 1884.

⁴⁶ *Norges Sjøfartstidende*, 3 January 1899.

However, natural ice was to some extent also being exported from the Swedish west coast, *inter alia* to New York. On these occasions the ice was allegedly harvested on the great lakes in the interior and transported on the Göta canal to Gothenburg.⁴⁷ In the coastal areas of western and southern Sweden, the climatic conditions for harvesting ice were poorer than in south-eastern Norway. The fishing industries there were actually importing ice from Norway until the early 1960s.⁴⁸ The Swedish ice export to New York was probably prompted by ice famines and high prices in North America. The extra inland transport that would have to be incurred probably inhibited regular ice exports from western Sweden, even to European markets. This, however, remains to be researched, as do many other aspects of the ice trade in the Nordic countries.

Local history in a global modernization process

The international trade in natural ice in northern and western Norway came to an almost complete halt during the First World War. It never really picked up again after the war, losing out to artificially produced ice and modern cooling and freezing techniques.⁴⁹ But in the preceding decades Norwegian ice exporters had been part of an important global transformation in the preservation and trade of fresh food. And to numerous small towns and coastal villages, especially in the Oslo fjord and Telemark region, the local ice businesses played a very significant economic role for almost two generations before the outbreak of war in 1914.

Partly because the harvesting of natural ice continued in many places to the 1950s and 1960s for local use in private households, restaurants, fisheries, dairies, grocery stores and on farms,⁵⁰ there is often a very high awareness of the glorious days of the Norwegian ice export trade in these communities. This is a topic that lends itself easily to dissemination, and to demonstrating the relevance of international and global developments to local history as well as the other way around. The 'Last Ice Age' is still remembered with pride by many locals, and a great number of local history studies have been written about the ice trade, by amateurs as well as by trained historians.

Although useful for some purposes, the history works on the ice trade are often limited in scope and ambition. We know a lot about local ice dams, local ice harvesting and local ice traders.

⁴⁷ Vretblad, 'Djupfryst', 147

⁴⁸ See <https://lokalhistoriewiki.no/wiki/Isdrift>; <https://www.porsgrunn.folkebibl.no/bok/bedrifter/sg-1994/sg-13.html> (accessed 19 January 2022).

⁴⁹ Ouren, 'Norwegian Ice Trade', 35.

⁵⁰ For example, Gro Hoddevik, 'Oslo Ismagasin på Årvoll', *Groruddalen historielag årbok 1987* (Oslo, 1987), 33-37; <https://oslobyleksikon.no/side/Isskj%C3%A6ring>; <https://lokalhistoriewiki.no/wiki/Isdrift> (accessed 19 January 2022); Norseng, 'Fersk fisk og kald pils', 223-4.

However, we have far less systematic knowledge about how ice merchants, shipowners and other links in the logistic chain, as well as the food and transport industries and consumers in the quickly growing foreign markets, adapted to great fluctuations both in supply and demand of ice.

The overseas trade in ice was a complicated and sophisticated business that needs to be studied on several levels. It was highly speculative, with supply, demand and prices depending heavily on seasonal changes in temperatures as well as weather variations from one year to the next. It also became very competitive, with artificial ice makers rivalling and then superseding natural ice providers in the major industrial markets. In this transitional process, to bolster their market share some of the ice industrialists, individually and collectively, resorted to unsubstantiated and false claims about the impurity and economically damaging effects of natural ice imports, as Dorovitsa and Heidbrink demonstrate for France and Germany respectively. In undertaking the 'Last Ice Age' project, it is our ambition to reach a more profound understanding of the different ways of operating in this business, and of how the various players, both in Norway and in the importing countries, endeavoured to meet and cope with these challenges – and ultimately, of how the international trade in natural ice interacted with technological developments in transport, by ship and by rail, contributing to a logistical revolution that became an important part of modern life in northern and western Europe.

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Author biography

Per G. Norseng is emeritus professor at the University of South-Eastern Norway and a retired senior curator in the Norwegian Museum of Cultural History/Norwegian Maritime Museum, Oslo. He has formerly inter alia been Head of Research and Director of the Norwegian Maritime Museum and Head of Department at Telemark University College. He has also held academic positions in the universities of Oslo, Trondheim and Stavanger. Norseng has published extensively on Norwegian medieval urban, regional and legal history, and medieval and modern Norwegian coastal history. He is project manager of the 'Last Ice Age' project, funded by the Research Council of Norway.