KULTURELLA PERSPEKTIV

Research article

A frozen culture

Johan Martin Dahll (1832–1877) and the overseas ice business

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Between 1850 and 1914, Norway was a major supplier of natural ice to Britain and western Europe. The blocks of ice were kept across time and distance. The cold energy of ice was transferred as it melted in cabinets and boxes. The natural ice industry had a composite range of end consumers in restaurants, ocean liners, food industries and pelagic fish trawlers. At the same time, natural ice was also a production industry, based on methods for natural resource extraction. This article argues that while macro preconditions and structural outlines are generally understood, there has been little exploration of the social or technological processes by which it came to be a source of wealth (for a few) and employment (for thousands). It singes out for attention one entrepreneur, Johan Martin Dahll, who between 1850 and his death in 1877 was crucial in shaping the industry in a Norwegian context.

Keywords: natural ice industry; refrigeration history; rural technologies; 19th century logistics; early food chains

Mellan 1850 och 1914 var Norge en stor leverantör av naturis till Storbritannien och Västeuropa. Isblocken hölls relativt intakta över tid och avstånd. Kylan från is överfördes när den smälte i skåp och lådor. Naturisindustrin hade ett sammansatt utbud av slutkonsumenter inom restauranger, oceanångare, livsmedelsindustrier och pelagiska fisktrålare. Samtidigt var naturis också en produktionsindustri, baserad på metoder för naturresursutvinning. Den här artikeln hävdar att även om makroförutsättningar och strukturella konturer är allmänt förstådda, har det gjorts lite utforskning av de sociala eller teknologiska processer genom vilka isindustrin kom att bli en källa till rikedom (för ett fåtal) och sysselsättning (för tusentals). Artikeln fokuserar på en entreprenör, Johan Martin Dahll, som mellan cirka 1850 och hans död 1877 var avgörande för att forma branschen i en norsk kontext.

Nyckelord: isindustri; kylhistoria; landsbygdsteknik; 1800-talslogistik; tidiga livsmedelskedjor

From the mid-19th century until the First World War, Norway was a major supplier of cold energy to western Europe, first and foremost to Britain (David 1995, 2000; Freeman 2018). The coldness was contained in regular-sized blocks of freshwater ice, which teams of laborers cut and shifted from lakes or specially constructed ice dams. Following periods of storage in icehouses, the product was subsequently shipped across the North Sea on journeys that usually kept more than 90 percent of the product intact (Wiborg 1943/1996). The ice trade was a maritime one, connected to the expanding capacity of the Norwegian sailing-vessel merchant navy after 1850 (Kiær 1893; Norseng 2014).

Some of the macro and climatic preconditions for the overseas ice trade have been explored systematically (Ourén 1981, 1991). In these works, the crucial explanatory variables are the climate zone variations between Nordic and Continental regions. Good ice years were caused by failing overseas ice harvests, mainly due to mild winters further south. This was not a smooth, linear process: a price index for natural ice 1866–1920 demonstrates volatility, with steep fluctuations from one year to the next (Klovland 2013). However, there was sufficient tendency and momentum in the business after 1850 to make it a regular feature of several coastal communities in the southeastern region of Norway. According to US literature, this was mainly due to the Norwegians copying the New England methods of ice water production and transportation, eventually beating them at their own game on the European and British markets (Cummings 1949: 17; Dickason 1991; Rees 2013: 26).

After 1890, the competition increased from coal-fueled plants for generating ice and coldness (Heidbrink 2022).

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Image 1. Ice being loaded onto a sailing ship, Kragerø 1908. Photographer: Anders B. Wilse. Norsk Folkemuseum collections, NF.08668-039.

Still, seasons of high demand for natural ice continued until the outbreak of the First World War. During the war, exorbitant freight rates and failing markets effectively served to halt the exports. Subsequently, foreign trade diminished to supplying some domestic, Swedish, and Danish fishing ports with natural ice. The last few ice companies folded in the 1960s.

A new look at the beginnings of the Norwegian ice exports

This article aims to shed new light on the formative period of the Norwegian overseas ice trade. This formative phase may be defined in several ways. Here it is taken to mean the period from about 1850 to the end of the 1870s. This was a period in which the ice trade moved from a sporadic endeavor to an annually occurring phenomenon. An intricate logistical system was built to facilitate long periods of storage and transportation, aiming to raise the profitability of the trade. There is no scholarly discussion of the social and cultural factors that may explain how this came about. This omission offers opportunity for new insights into processes that for decades led thousands of individuals to participate in the ice production, transportation, and trade.

The problem may be approached from different angles. This article looks closer into a central entrepreneur of the early Norwegian ice trade: merchant and minerals tycoon Johan Martin Dahll (1832–1877). Dahll hailed from the seaport of Kragerø on the southeastern coast of Norway, situated a few days' sailing distance from most North Sea trading hubs. The town was one of the southeastern ports of the timber and mining exports region of Norway, which played a crucial role in the economic expansion of the 1840s–1875 period (Sandvik 2018: 61–102). Surrounded by an archipelago with scores of freshwater lakes close to the seaways, Kragerø was one of the chief locations of the Norwegian overseas ice trade (Ourén 1991). Local historiography agrees that Dahll's activities were crucial to this (Steffens 1916: 331; Olsen 1981; Pedersen, Amund & Vaale, Lars-Erik 2016: 251), but the matter is suggested and not really examined. His 1877 obituary simply stated that Dahll was "the first in the [Kragerø] district to subject ice harvesting to rational operation" (*Morgenbladet*, 12 December 1877. All quotes from newspaper sources translated by author).

In order to gain better understanding, the objective is to investigate the elements of Dahll's apparent "rational operation". As such, the inspiration is Weberian: an actor analysis that places emphasis on the "the values and aims that the actions are meant to realize" (Engelstad 1999: 13). Dahll's involvement with ice is a case in point of entrepreneurial activity in mid-19th century Norway. Historian Francis Sejersted claims that the "new entrepreneurs were the heroes of their time", operating with support from a "modernizing ideology combined with a remarkably strong sense of optimism" (Sejersted 1993: 73). This impulse was tempered by technological conservatism, however, as all-encompassing changes conducive to social disruption were long avoided (Sejersted 1993: 74). How does this outlook fit the case of the ice industry, as demonstrated by one of its protagonists, Johan Dahll?

The answer to these questions have been sought in diverse sources, which have been located and read as part of the author's PhD project. Fragments of Dahll's company archive have survived (BKM). A family

chronicle has passages on Dahll and the ice business (Dahll 1959: 246–258). The piece was likely penned by the geologist Tellef Dahll (1825–1893) and contains crucial detail. However, the celebration of Johan Dahll's personal achievements in the ice business disregards any other actors except for his younger brother Georg Dahll (1835–1875), who acted as broker and agent for the family firm in London. The chronicle also neglects the fact that the technological basis for Dahll's success originated in the United States. No clues are given to how he transferred those tools and procedures onto Kragerø soil, whether through acquisition or imitation. In these and some other matters, contemporary newspaper reports and articles have been studied, augmenting the source base to a degree. Some details remain obscure, but the sources make it possible to analyze the ice trade in the context of contemporary economic, social, and technological developments. Transport logistics were important for the latter. The telegraph came into the mix in the 1850s and was a technology of major import to the fledgling overseas ice trade.

The rest of this article falls into three main parts. The first part sketches the very first ice exports from Norway, as a necessary context for the actions and aims of Dahll, who then stands as a representative for the new modes of ice export. The second part discusses and describes the Dahll system of ice production and exportation. Finally, the concluding discussion addresses social aspects that impacted the establishment of the Norwegian ice trade.

Early ice exports and American influences

By 1850, exports of Norwegian ice had been underway for almost three decades. The first shipments in 1822 were organized by British ice merchants, partly to supply the northern British salmon industries with transport ice for fish sent to London. The harvesting was done by local peasants and farmers on the Folgefonna glacier in Western Norway (*Morgenbladet*, 4 October 1825). This was a demanding and expensive way of fetching ice, compounding the perception of a commodity for luxury consumption.

From the 1830s, the source of ice would be brackish sea water, making for a rather turbid product. Nonetheless, ships were being loaded with such ice on their first journeys out for the sailing season. In some instances, this was caused by rumours of demand for ice in cities like Le Havre or London, but captains were also being charged with finding any place to sell ice. The latter type of journey is documented for the Kragerø vessel the *Commerce*, which eventually unloaded 1200 Francs worth of ice in Algeria in the spring of 1839 (Bagle 2022: 77–81). Very likely, ice was also initially considered a means of ballasting sailing vessels, instead of using rocks. An indication of this is an 1842 Norwegian parliament decision stating that ice, along with hay and rocks, was to be exempt from shipping fees (Bagle 2022: 88–90).

In March 1851, Norwegian newspapers reported a "strong speculation" in ice in Kragerø and the surrounding districts (*Christiania-Posten*, 20 March 1851). The demand was caused by a mild winter in countries of "southern latitudes", mainly Britain, Ireland, and France. All were depicted as countries consuming "a great amount of ice" (*Christiania-Posten*, 20 March 1851). Temperature data suggest that January 1851 was warm in Central England, with a mean temperature of 5,6°C as opposed to 0,7°C the year before (Beamon & Roaf 1990: 142–147). The underscoring of local temperatures failing to yield ice indicates that Norwegian ice substituted local production, which generally seems to have been a continuation of occurrences in the past. Norwegian ice was used by ice cellars, kitchens, and cafés, as well as butchers, wild game shops and fishmongers (*Christiania-Posten*, 24 March 1851).

However, the quality of ice was measured against the New England product on the European markets (*Christiania-Posten*, 2 February 1851). The company marketing *Wenham Lake Ice* was renowned for its transparent and sediment-free ice. It became the trade name for clear ice in Britain from the 1840s. Another byword was "Yankee blocks of crystal" (Dickason 1991). The foundation for the regular supply of this "crystal ice" was a number of innovations that have been linked to the "Boston Ice King" Frederic Tudor (1783–1864), as well as his business associate *and* rival, the Massachusetts ice harvester and engineer Nathaniel Wyeth (1802–1856) (Cummings 1949: 17–31).

The essential part of the American ice harvests was to use freshwater as the source and to cut the ice in regular-size blocks of about 25 square inches. The smooth surfaces made by the steel blade ice saws made for a smaller total melting area, reducing the speed of the melting. While the actual cutting, transports, and storage in icehouses (see below) were vital steps, so was the pre-harvest grooming of the ice. As soon as the ice was thick enough for support, horse powered shovels or planes were used to clear the ice for snow, twigs and leaves and any other visible contamination.

The details of how these procedures, and their accompanying implements, were transmitted to Norway remain slightly unclear. Given the rather open nature of the technology, and the fact that patent rights were not respected, the industry seems to have been ripe with possibilities for technology transfers. In Norway, a number of merchants acted as pioneers, each in their district. In Kragerø, the position of regional ice pioneer came to be the young entrepreneur Johan Martin Dahll.

There is no mention in my sources of Dahll going to the US to learn about the technology, which, however, does not exclude the possibility. The family chronicle depicts the events starting with the younger brother Georg Dahll, who settled in London in the early 1850s, registering a great demand for ice from the English fishmongers. Noting that the saltwater ice being supplied was inferior, Johan and Georg Dahll thought of

Image 2. Ice harvesting, apparently on a Kragerø lake. The blocks were cut and hauled out of the water manually. Photographer: Gustav Borgen, date unknown (probably 1900-1910). Norsk Folkemuseum collections, NFB.33657.

starting a business based at the lake on the family property (Dahll 1959: 255).

It is only through contemporary newspaper reports that it emerges that Johan Dahll modelled operations on American methods. For example, the workers used one or more horse-drawn ice ploughs to mark out the grids for ice blocks, which were subsequently sawn by teams of workers standing literally at the water's edge. The reported "improved ice cutting techniques" referred to the use of iron or steel ice saws and a "way of getting the ice much cheaper and faster into the ships than before" (*Morgenbladet*, 3 March 1853). The latter is a reference to a gravity chute from the lake's dam to the shipping point. It can be inferred that by the 1851 and 1852 seasons, Dahll was selling ice that adhered to what emerged as a business norm of 24–25 squares inches. The clue to this is information that the horse powered ice plough making the grooves had cutters "one Alen" apart (*Morgenbladet*, 3 March 1853). An *Alen* equals approximately 24 inches).

Shaping a local ice community

Aside from the somewhat unclear mechanisms of technology transfer in this case, it is evident that they rested on local endowments and topographical features. Location was key to Johan Dahll's entry into the ice business. The Kalstadtjern lake on the family property had a surface area of at least 300 metric hectares, and only a couple of hundred meters from the shipping piers of the fjord. The surroundings provided tranquility and good conditions for crystal ice formation.

Demand for labor in the ice harvests and shipments contributed to the social formation of the community. Without going too deeply into statistics, I will give an overview of the effects on the local community. In the 1845 census, Frydensborg had 77 persons living in 17 households. The corresponding numbers in 1855 were 128 persons spread into 23 households; in 1865 the numbers were 63 houses and 84 households with a total of 391 persons (Bagle 2022: 111–112). The population growth was not likely due to the ice industry alone. Its seasonal rhythm seems to complement the seasons of agriculture and sailing vessel shipping. Men taking part in the February-April ice harvests would be enlisted as crews on the ships taking the ice overseas, and in this respect the industry – viewed in relation to its logistical chains – did offer longer periods of employment. This suggests that the availability of an experienced labor stock must have been a great advantage to Dahll's ice ventures. Social formations added to the "favorable location" of the Frydensborg ice traffic.

Dahll expanded the productive area of freshwater ice production by having workers make ponds. In 1853, it was noted that "a piece of land has been dammed for collection of ice" (*Morgenbladet*, 3 March 1853). It is likely to have been the first inundation of land for the purpose of ice production in Norway. This was also very much a matter of location, as the fields were dammed in the vicinity of the sea and the shipping lanes. The dams or lakes were often connected to the loading piers or icehouses by wooden chutes that might stretch for kilometers. The practice of making such dams came to be widespread in Kragerø and other Telemark and Oslofjord locations. Making artificial ice ponds was one way of expanding the production capacity. Dahll also initiated business on nearby ice lakes (Dahll 1959: 248).

Expanding the seasons

It also seems reasonable to conclude that Dahll pioneered the systematic use of icehouses in the Kragerø ice trade. The single term *icehouse* refers to a variety of materials, architectural principles, construction methods and performance levels. In the 19th century,

Image 3. An ice chute with a block of ice in motion, at Hellefjorden in the Kragerø district, ca. 1910. Photographer: Johan Lyng Olsen, Berg Kragerø Museum/Telemark Museum Collections, BKM.F.000845.

it could cover anything from the most ornate masonry structure on a manor to wooden sheds for private farm use (Beamon & Roaf 1990: 3–6). Significantly, the term also encompassed a lot of different arrangements for ventilation of the water evaporation, which if left unchecked accelerated melting.

Dahll contributed to making a spacious variant of the American style over-ground, insulated wooden icehouse a common feature of the Norwegian ice business. The largest reported icehouse in the Kragerø region, by the 1870s, was a construction of 70 x 15 meters, and seven meters high (Nemda 1953: 63). These barn-like structures became a noted feature in ports and rural communities along the southeastern shores of Norway.

The descriptions from the 1851 spring season indicate that the product was cut and transported to the ships for immediate overseas shipment. Dahll's initial business model was to grow, cut and sell the freshwater ice to *other* Kragerø merchants, who then filled their ships and contracted with overseas buyers. This intermediate state of affairs only lasted a couple of years in pure form. By 1853, Johan Martin Dahll evidently sold on his own account to British purchasers (BKM/Ba 114/J.G. Dahll Letterbook/12 August 1857). The first icehouse at Frydenborg was a "large icehouse" that was filled with ice in March 1853 (*Morgenbladet*, 3 March 1853).

The use of icehouses has been identified as crucial to the regularity, by way of profitability, of the Norwegian ice exports (Ourén 1991). While the New England ice merchants operated their own icehouses in the Caribbean and India, and in some cases established regional monopolies (Dickason 1991), the Norwegian ice merchants seem to have had vested interests in their own icehouses. They acted, as will be demonstrated in the next section, under competitive circumstances on established British and European marketplaces. Still, the capacity to delay sales of ice until more favorable times in the season was hugely important. The initial shipments of ice in the April-June stretch were to be called "spring shipments", and they occurred on either pure speculation, or on contracts closed months before. The "summer shipments" were the ones starting in July and went on for as long as there were markets into the autumn. The change has been quantified: in the 1850–1870 period, typically 20–30 percent of ice was sold as "summer shipments", and after that the figure grew to 70–80 percent (Ourén 1991).

The pace of change can be observed in the case of Johan Dahll's ice business. In 1860, only about seven years after the first icehouse was erected, his business was reported to have exported 5500 tons of ice in 14 consignments, to markets in England, Ireland, and France. Only about half of the spring's harvests were being shipped. Between 4–5000 tons were loaded in icehouses for summer shipments (*Kragerø Adresse*, 28 April 1860). While this is just one observation, it suggests that Dahll's business was ahead of the trend with regards to summer shipments. The icehouses filled an important function in this process. Keeping in close touch with the overseas markets was essential.

Communications

As much as anyone in the business, Johan Martin Dahll depended on a trading network, in particular on his younger brother J. Georg Dahll (1832–1875). Georg Dahll left Kragerø for London in the early 1850s and established a brokering office in 1858 (Dahll 1959: 255). A letterbook from J. Georg Dahll from the period of 1856–1859 sheds some light on the commercial side of the early ice business on the British markets, tracking partly his role as agent for the Dahll ice (BKM/Ba 14/ Letterbook G. Dahll 1856–59).

On the 12th of August 1857, Georg informs Johan that he visited the offices of the American *Wenham Lake Ice Company*, without disclosing the result. The day after, he "had been around at several ice merchants" and a Mr. Newby was in the market for 200 to 300 tons (BKM/Ba 14/Letterbook G. Dahll 1856–59: 94–96). Georg then inquires of Johan whether he has any ice left for delivery, an instance reflecting the shift to summer shipments depicted above. There are references to competitor Norwegian suppliers, some of whom where shipmasters acting on their principals' behalf. Ice

Image 4. Thousands of tons of ice stacked in a roofless stack, awaiting transportation. From Svartjern, Kragerø, date and photographer unknown (probably after 1900). Berg Kragerø Museum/Telemark Museum Collections, BKM.F.003905.

merchant Newby had thus already commissioned "a cargo" from Captain Hjorth on the *Thor* of Christiania. The negotiations included allusion to the qualities of ice demanded.

In 1857, there were ten ice merchants listed in London, most with backgrounds as fishmongers (Kinross 1991: 27). Georg Dahll would have been aware of all of them, and of agents and merchants in other UK ports. In the early 1860s, the company of Carlo Gatti evolved as an important customer for Norwegian ice. The link between Gatti and Dahll has been expounded on (Kinross 1991: 28–31). Carlo Gatti (1817–1878) was Swiss and came to England in 1847. He first made his mark as an ice merchant and confectioner, before later establishing restaurants and music halls, all served by ice vaults at the Regent's Canal and some others in the London docks. Gatti is credited with a major part in making ice cream available to the general public, by organizing the carts of Italian-speaking ice cream vendors offering "penny-licks". In 1901 the Gatti company merged with two other firms to become the United Carlo Gatti, Stevenson, and Slaters company. The link to the Gatti ice and restaurant venture constitutes one case of natural ice imports impacting or facilitating cultural change. Ice cream as a product of mass consumption may be traced back to these developments.

Georg Dahll performed the salesman legwork described above and collected intelligence on the several different ice markets around the British Isles and Ireland. He also kept track of individual buyers and the experiences from direct interactions, as when he reported to Johan Dahll in 1857 about ice dealer Mr. Thomson. Thomson was still unconvinced, having received a cargo of "poor ice" from Dahll in 1853 (BKM/ Ba 14/Letterbook G. Dahll 1856–59: 26). Furthermore, Georg Dahll monitored shipments and issues, such as trouble with the unloading or weighing of ice. With some modifications, the relationship between the two brothers in this rather new enterprise rested on an institution observed in many cultures and time periods: the strategic deployment of kin in distant trading ports.

The traditional mode of this network blended with new modes of getting in touch across the oceans. The electric telegraph was instrumental, perhaps on a level comparable to the icehouses, in making it possible to delay shipments of ice until market conditions were favorable for the ice exporters. The first Norwegian line connecting the country to abroad was built in 1855 (Rinde 2005: 56–60). It ran from country's southeastern tip on the Swedish border, up the Christiania fjord and further through the port cities on the Telemark and southern coast, including Kragerø. The speed of communication over great distances was reduced from days and weeks to a matter of hours. This enabled ice exporters and producers to monitor overseas markets. It is not surprising to find Johan Dahll among early adopters. The telegraph, which put Kragerø within hours' reach of London and other important destinations, expanded the range and speed of decisions coming out of the company office.

Ice generating wealth

It has already been noted that Dahll was far from solely engaged in ice. The other lines of his business, apatite, and nickel extraction, rose to economic significance equal to the ice exports. The mining business was carried out adjacently to the ice business. It is a fact that for the majority of both owners and workers of the ice industry, it was just one element out of many in a mix of economic activities or means of subsistence. In 1853, Dahll was hired as local manager for the UK company Evans & Askins apatite works, and for the same company's nickel mines at Bamble, where noted UK geologist David Forbes (1828–1876) was also present at the time (Dahll 1959: 250). The family chronicle emphasizes his direct involvement in the methodical

development of the nickel ore, getting a far superior product containing close to 70 per cent nickel content. Dahll had a "modern laboratory for its time" built at Hestøen, close to Kragerø, where the smelting occurred (Dahll 1959: 250).

By the mid–1870s, the various businesses of mining, shipping and ice had made Dahll Kragerø's second richest individual, judging from the Kragerø tax rolls. For 1875 he was listed with an assessed estate at 115 000 Speciedaler, and 1876 with 125 000 (*Morgenbladet*, 12 April 1875, and 22 January 1876). The capital estimates were probably very conservative. Dahll's enterprise was one of unbound capital accumulation, but a few more traits must be considered. Dahll's most significant operations had a regional or local base.

When Johan Dahll died unexpectedly in 1877, the most "magnificent and expensive" funeral in the town's history was held in Kragerø, bankrolled by the municipality to honor the deceased "pioneer" (Hougen 1936: 186). An honorary guard was set up by some of the 400 workers who were counted as regular in the Dahll labor force, who "had for a long time looked up to him as a decent and caring employer" (*Morgenbladet*, 8 December 1877). Dahll and the other ice entrepreneurs starting up in the 1850s and 1860s depended on an experienced workforce. The image of the ice entrepreneurs acting as social benefactors was expressed in many ways. A Morgenbladet 1866 article on one of the Oslofjord ice entrepreneurs praises him by claiming that "many mouths are fed by his money, long before he sees a penny on his expenses"(*Morgenbladet*, 14 September 1866).

The ice business emerged an important source of salaried work for the rural labor force during the wintertime. This was important in a maritime town like Kragerø with surrounding districts. Sailing was predominantly a summer activity, but with the ice industry came several winter tasks such as building and mending chutes and icehouses, as well as to shovel and keep the dams clean as ice was forming (Hopstock 1975: 250). As the industry grew, both before and after the death of Johan Dahll, owners and entrepreneurs of the ice business continued a paternalist tradition of offering work to a labor stock that was largely, but far from exclusively, local. As time wore on and the business came to create even more demands for labor and space in the 1880s and 1890s, cracks emerged, and ice workers came to organize some of the earliest strikes of the Kragerø district (Finstand 1999). However, in a very broad perspective, it may be concluded that although the ice industry represented innovation, new markets and employment, it never really caused any significant changes in traditional working life relations.

Concluding discussion

This article has thematized the nineteenth century ice trades from Norway, specifically the 1850–1870s shift from random occurrences to a regular ice industry. The contribution of this paper is to connect this shift to observable actions and possible strategies of one of the dominant early ice merchants in Kragerø, thereby also investigating the ice trade within a local sociocultural context. As the features of the "breakthrough" 1851 season illustrates, Johan M. Dahll was never the only player. While certain businessmen were powerful linchpins in their regional settings, the ice industry was decentralized.

How may the transformations in the actual practices of ice exporting have been impacted by the strategic deliberations of a powerful actor like Johan Martin Dahll? He was a businessman who reaped profit opportunities in land and mineral resources. The basis for these approaches can be found in his immediate networks. Dahll's modernizing impulse also fed on a practical-minded willingness to learn from, copy, and adapt technologies and practices developed elsewhere.

The rudiments of the freshwater ice harvests, as developed in New England over the preceding decades, were mastered by Dahll and his workers by 1851. In the first few seasons, this mainly concerned shifting to lakes as sources of ice and employing ice ploughs and harvesting methods. These provided the square blocks that usually weighed about 150 kilograms, all handled manually with the assistance of ice saws, spikes, and tongs. In the first two or three seasons, the business model was mainly to supply natural ice to other Kragerø and Norwegian shippers who would then take it overseas. Systematic improvements followed in the 1850s and 1860s. Dahll implemented double-walled icehouses insulated by wood shavings or straw, which contemporaries labeled "American" icehouses. It is also apparent that Dahll was an early adopter of the telegraph communications network to enhance his ice trade.

The entrepreneur Johan Martin Dahll acted in a time of industrial and infrastructural innovations, which gives reason to further examine the possible "industrial logic" to these events. Johan Martin Dahll's ice business was a manifestation of a modernizing ideology that blended optimism and conservatism, much according to the view held by historian Francis Sejersted (cf. above). Technological changes that would lead to social disruption were avoided. The ice industry was mainly developed as a rural phenomenon, providing opportunities for wintertime employment. The work cycle, with its push to mobilize workers before the spring harvests in the fields or the departure of ships, contributed to the dynamic and fluid professional life of southeastern coastal communities. However, there were limits to the degree of innovation. In this sense, the ice industry almost offers a metaphor for social life in the late 19th century. The blocks of ice served to preserve foodstuffs in distant locations, for instance in the restaurants of Dahll's business connection Carlo Gatti in London. Likewise, ice exports represented a force of conservation to the social structure of Kragerø. It is likely a similar case in other Norwegian communities engaged in the ice trade.

Author bio

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