

## Concluding remarks

The story of the Norwegian natural ice industry is a story of success followed by decline. The key to the industry's success was the ability to produce a quantity of natural ice that far exceeded domestic demand, unlike most other countries in Europe, and to sell and export the ice to customers abroad. This has been a central dimension of the Norwegian ice industry as discussed in the book. Ice exports began in the 1820s and the industry grew from the 1840s until the peak year of 1898, when a total of 553,366 register tons of ice were exported. The following year, export volumes started to decline, and this continued during the First World War. By the end of the 1920s, the total volume was down to 17,251 register tons (1929). Although small quantities were still being exported as late as the 1960s, Norway's 'last ice age' was over.

## The growth and decline of the Norwegian ice industry

A focus in this book has been the development of the Norwegian ice industry from about 1870 to 1930.

Ice was the fastest growing export commodity (measured in tons) throughout the period 1865 to 1898 and we can, on this basis, conclude that the ice industry was initially a success. The industry was important as all-year-round or winter work for many people and thus contributed to employment in the ice districts. Virtually all ice was exported by ship, and it was an important cargo for both sailing ships and steamships built of wood, contributing to significant incomes in the shipping sector and securing work for the seamen onboard. Some ice exporters owned the ships they used, but chartering ships was also a common way of securing shipping space and both Norwegian and foreign ships were used. The ice industry also promoted internationalisation by (large) ice exporters

forging long-term business networks with brokers, ice agents, ice importers and others spread across Europe. The younger generation was sent to business contacts abroad to learn the trade and the language, while the sons of Norwegians abroad were sent to Norway, to learn Norwegian and the trade here. The telegraph was also important for maintaining contact within the network and for securing necessary information about the market. Strategies involving regular deliveries to known customers or regular contracts brokered by well-known ice agents, often in combination with the use of forward contracts, were used by (large) ice exporters to counteract losses due to market fluctuations.

Volumes and values fluctuated from one year to the next in line with the temperature, and the market conditions for Norwegian ice appeared in general volatile. The peaks coincided with hot summers with strong demand for ice and/or with mild winters in Europe, where local natural ice producers were unable to meet demand, leading to increased demand for Norwegian ice. Imports to Germany were particularly important in this context. Normally the country was self-sufficient, in combination with imports of ice from the Alps, but in mild winters large quantities of ice were imported from Norway. The increased German imports thus greatly contributed to the increase in both the value and the export volume during these years. In some peak years, however, the ice had a high value while the exported volume remained low. It was in such years of limited supply and strong demand that ice exports had the highest value.

During the 1890s, the Norwegian natural ice industry faced a series of problems. Factory-produced artificial ice was gaining a foothold, major British importers were using their market power to control the market, there was a total lack of cooperation among the Norwegian exporters and there was a surplus of natural ice. All in all, this caused the prices to drop. Standing out from the rest of the decade was the record year 1898, with a value on natural ice of NOK 8.97 per register ton, the second highest in the period covered by this book. It was a year which, for many ice exporters, in terms of profitability, saved the decade. After 1898, the situation for the Norwegian natural ice industry changed for the worse, with a decline in both volume and value.

A key factor in shaping this decline was innovation in refrigeration and freezing technology. Commercial refrigeration was developed from the late 1850s, making it possible to cool down goods without ice. In the late 1870s, several companies patented new improved refrigeration plants, which sold in large numbers. In most countries in which refrigeration equipment became available, its first use was typically to produce artificial ice, and ice could now be produced much closer to the end users. This was a real technological shift in ice production, involving a transition from the traditional production of natural ice from ponds in winter to the all-year-round manufacture of artificial ice in diverse locations.

Around the turn of the century, artificial ice was competitive with natural ice in both price and quality. Norwegian exporters were now offering ice that was made with what was becoming 'second best' technology. The price was falling, nevertheless natural ice continued to be produced for some time yet. Norwegian ice exporters were investing in a trade where competitive advantage could only be achieved by selling the commodity at very low prices and where profitability was created by cutting costs to a minimum. Anyway, the market for natural ice was shrinking and it was only a matter of time before refrigeration and factory-made ice took over the entire market.

Another factor contributing to this decline was the conflict between the manufacturers of factory-made ice and importers of natural ice, which centred on the purity of the two products, with natural ice gradually losing out. Artificial ice production benefited greatly from the bad reputation that natural ice was acquiring, not least in the form of larger market shares. The Norwegian ice industry, backed by the Norwegian authorities, responded to the attacks, but to little effect.

Also political factors played a major role. During the First World War, Norwegian export volumes of ice fell from almost normal levels in 1914 to virtually zero by 1918. This decline was fuelled initially by the German authorities, who in 1915 declared that UK waters were part of a 'war zone'. The situation was exacerbated in May 1916, when the UK authorities banned imports of ice, causing exports from Norway to come to a halt.

After the war, the trade in Norwegian natural ice never recovered. The almost total cessation of trade during hostilities meant that domestic

factory-made ice gained increasing dominance in the European markets. Moreover, Norway's production capability was constrained because many exporters had closed their businesses during the war, leaving much of the production infrastructure largely defunct. Lastly, the number of British ice importers had decreased during the war and storage warehouses had been demolished.

The decline in ice exports should also be seen in the light of the Norwegian economic policies in the 1920s, making Norwegian goods less competitive in international markets.

Throughout the 1920s, Norwegian natural ice represented a commodity reserve that was mobilised in years of strong demand. However, 1925, when Germany was back in the market, proved to be the final convulsion of the industry. Its success was not repeated in the following years, up to and including 1930. Although minor exports of ice continued up to the 1960s, an era was over.

## Thomas Johannes Wiborg's business operations

A second central dimension of the book has been the in-depth study of the fortunes of one of Norway's largest ice exporters, Thomas Johannes Wiborg (1845–1929). He was active in the ice export trade for nearly 60 years, and he also became a shipowner. This has provided further insights into the growth and decline of the Norwegian industry; the challenges and problems ice exporters were faced with in this volatile industry. It reveals factors that appear to have fostered success or failure.

For the transport of ice from Norway to customers abroad, the Wiborg companies used exclusively chartered ships. In fact, a significant proportion of the ice was sent in foreign ships via the international shipping market. This brings out a novel aspect of how the Norwegian ice industry operated. In the literature, the shipping of Norwegian ice (and also timber) has been seen as a typical Norwegian activity, and the typical ice exporter as the owner of the ship. In this book, we have shown that chartering ships was common and that the ice trade was a part of the international shipping market. We have described a major Norwegian ice exporter who for many years did not own ships but chartered largely

foreign vessels for transport. The main requirements were probably that the crew had knowledge about transporting ice, the price, and that it could be in the loading port at the right time.

It is often believed that it was common for ice exporters to confine all of their activities to a specific geographical area: a city or a customs district, usually in close proximity to where the ice was produced. Wiborg cast his net much wider. The company's office was located in Kristiania, Norway's centre for market information, where many brokers and agents were based and communications were good, including telegraph connections abroad. Operations spanned across several locations within the two main areas for ice export. This created good conditions for ice production even under difficult temperatures, while at the same time providing market insight into the whole industry.

In the literature, the sale of ice abroad is often described in terms of ice exporters selling to one country or to one specific city. In Wiborg's case, however, export destinations were numerous and widely dispersed; the main market was the UK, but Wiborg also exported ice to a number of other countries. Often it was an ice agent who brokered the sale. The international ice market was complicated, with large distances and a number of players in different locations and countries. It was, therefore, challenging for a participant to keep up-to-date and on track. Wiborg developed relationships with a number of ice agents and delivered ice wherever the agent offered profitable business. Interestingly, after the agent had mediated contracts between Wiborg and a buyer for a period, the agent was dismissed, and the company and the buyer switched to doing business directly. Wiborg therefore also had a group of customers with whom it did direct business.

The literature on the Norwegian ice industry has until recently placed emphasis on domestic developments, with less focus on international aspects. What we can note is that Wiborg was intimately connected to a large number of foreign business contacts and connections and, in effect, built up a sizeable international network. The export destinations ranged from the Shetland Islands in the north to Algiers in North Africa in the south. Many of the connections lasted for several decades. Wiborg invested a great deal internationally, and the company succeeded in

establishing long-term business relationships and regular trade transactions. Since ice export was a volatile business, good broker contacts and loyal customers were important and, as we have seen, when the market was in decline, they helped the company to survive.

The use of different types of contracts was also important, and two types of contracts were extensively used by Wiborg. Large-scale, multi-year 'industrial shipping contracts' on an FOB (free on board) basis created predictable and stable revenues over time, while CIF (cost, insurance and freight) terms created the greatest revenue opportunities, but at the same time entailed greater uncertainty, since profits could change to losses due to delays that caused extensive melting, or by an increase in the rates for chartering ships after a contract for ice sales had been signed. Both types of contracts were regularly combined with forward contracts, for example, by entering into a contract in one year for delivery the following year.

Long-term financial relations in Norway also contributed to lessen the impacts of market decline. For instance, in the troubled 1890s the company was able to draw on its long-standing bank connection, the banking firm Thos. Joh. Heftye & Son. The bank postponed payments on loans, while in 1898, when Norwegian ice exports peaked, it financed short-term leases on ice plants which allowed Wiborg to increase production capacity. This support played a major role in the company surviving the years of decline and achieving a record high export volume and profit in 1898.

In the declining period that followed, Wiborg made further changes. Between 1902 and 1915, he terminated most of his leasing contracts for ice plants, produced less ice and instead purchased large quantities of ice from other ice exporters, to be sold abroad. This seems to have worked well and was indeed a fortunate turn, since the termination of the leases seem to have eased the problems that T. J. Wiborg had with the Norwegian tax authorities, which were linked to the leased facilities.

During the First World War, the decline in Norwegian ice exports continued and almost came to a halt in 1918. The shipping sector, on the other hand, experienced a wartime boom and in 1915, Wiborg expanded into the booming sector as shipowner in the tramp trade, carrying bulk cargoes. Similar to the export of ice, the shipping business relied on a

wide range of information and knowledge, spanning from pricing and technical issues to market characteristics and uncertainties. Interaction with external partners was therefore necessary to create the knowledge base that was required. Wiborg had been a charterer of ships for many years and had built up good long-term business relationships, and the knowledge required was largely accessed through these business links and, undoubtedly, through the crews and skilled employees. In other words, Wiborg apparently had good opportunities to succeed in shipping as well, which it did not do. The reason why can be explained by the international market situation. When the tramp trade was hit hard by the interwar crisis of the 1920s, the venture caused heavy losses for the Wiborg company.

The market for ice exports revived after the war, and in 1921–1923, the company was Norway's largest ice exporter. However, from late 1925, problems arose also here for Thomas Johannes Wiborg. In the wake of the Norwegian economic policy, the banks were under pressure, and in October 1925, Wiborg's bank terminated the company's overdraft facility. In June the year after, sadly, Thomas Johannes Wiborg's son and partner Tom died by suicide. The company was now in a liquidation phase, and both the ice and shipping business were wound up in 1927. Two years later, on New Year's Eve 1929, the ice exporter and shipowner Thomas Johannes Wiborg passed away, 84 years old.

