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Chapter 3

The Road to Independence (1892–1920)

The "King Stove" from Kværner Works, which was launched in conjunction with the dissolution of the union with Sweden in 1905. The stove was designed by Henrik Bull and heralded a new direction in stove design. After 1905 Kværner Works and a number of other stove foundries began to develop new models with a more characteristic Norwegian style. Kværner Works was the foundry that made the most of tying national symbols to stove design.



The period from the end of the 1870s to around 1905 was marked by economic stagnation. The growth rate in important sectors either decreased or stopped. But one sector continued to grow significantly, and that was industry. In fact, almost the entire net growth in the national product from 1875 to 1905 came from industry. Within the industrial sector there were some fields that grew more rapidly than others. Especially strong was the iron and metal industry, in which employment almost doubled over the twenty years from 1880 to 1900.⁸⁷

Expansion in the iron and metal industry provided the foundation for increased specialisation. In the decades before the turn of the century, many mechanical workshops began concentrating on narrower areas of production. Some became pure shipyards, others became specialised machinery workshops, and still others became speciality factories for the mass production of iron goods and the like. In 1900 it was no longer common for one mechanical workshop to produce steamships, turbines, agricultural machinery and stoves.

As we have seen in Chapter 1, stove-casting was one of the production areas which gradually became more specialised towards the turn of the century. Actually this was one of the areas in which specialisation made the greatest strides. In 1900 it was no longer true that any workshop operation could turn to stove production when other types of commissions encountered slack periods. Such activity had long since become the domain of specialised foundries.

At Kværner Works stove production remained an important factor for a long time, and eventually this activity was organised in its own division. Yet after the turn of the century, the stove division increasingly became a more peripheral part of the Kværner company. This was especially true after 1905 when Kværner began to be more active in machine production, and the production apparatus was gradually modified for this purpose. Of particular interest was the production of turbines for

the expanding development of hydroelectric power, and up until the outbreak of the First World War in 1914 the company was gradually being converted into a special workshop for turbines. One consequence of this conversion was that the stove division assumed a different role. Until about 1900 the division was an integrated part of the company. This changed as Kværner began to focus more and more on advanced machine production. In 1914 the stove division had become a production group isolated from operations as a whole. This finally led to Kværner's management electing to sell the division, which took place in 1916.

In this chapter we shall take a closer look at the conversion of Kværner Works in the period up until the First World War, and how this came to affect the stove division. We will also follow the company into its first years as an independent operation.

Kværner Works after Onsum

After Onsum went bankrupt in 1886 the creditors began to dispose of the assets of his estate. The majority was sold off over the next three years, and the Nail Works had new owners by 1889. It took longer to dispose of Kværner Works. The company was the last large asset in the estate to be sold off, and this did not occur until 1892. So it took six years after the bankruptcy before Kværner Works obtained new owners. Why did it take so long to find new owners for the company?

It is difficult to imagine that market conditions were the cause. It is true that the years around 1890 represented a period of economic recession. On the other hand, we have seen that the iron and metal industry was a field that grew considerably during this period. And for an operation like Kværner, which concentrated on supplying the timber-milling industry, among others, times should have been rather good. Several new timber planing mills were established in the 1880s and early 1890s. The first signs of saturation in this field did not occur before the early 1890s, at the same time that Kværner Works obtained new owners.⁸⁸ Nor can it be assumed that the construction sector, which was the other pillar in Kværner's operations, was experiencing any sort of recession in this period. For one thing, the population of Kristiania rose sharply between 1885 and 1895, which must have meant great activity in the construction field.

The difficulty in finding buyers may have arisen because Kværner Works was a comprehensive plant, and thus the price was relatively high. For example, Kværner was much larger than the Nail Works. While the estate asked for a little over 400,000 kroner for the Nail Works, the price for Kværner Works was about one million kroner.⁸⁹ In addition, considerable technical, financial and administrative knowledge was required to run a company such as Kværner, and the range of available people who possessed both the necessary technical skills and sufficient access to capital was presumably quite limited. Finally, there is reason to believe that the production equipment at Kværner was not as modern as could be desired. At any rate it seems as though no major modifications to the plant were undertaken after 1875.⁹⁰ This may have also contributed to the lack of interest amongst prospective buyers for the company.

One interested party appeared in 1892. A man with long experience in the workshop industry announced his interest. His name was Fredrik Wilhelm Louis Hiorth. He was an engineer and



Onsum's successor. In 1892 Fredrik Hiorth became the new head of Kværner Works.

had since 1877 operated Rodeløkken's Iron Foundry in Kristiania. This was a far smaller company than Kværner Works, but its production was actually rather similar. Rodeløkken supplied most of its machines and equipment to other industries, but like Kværner Works had concentrated particularly on machines and equipment for the timber-milling industry. In addition, Rodeløkken produced stoves and other cast trade goods in considerable quantity, so here too there were clear parallels to Kværner Works. In other words, Hiorth was completely familiar with the products on which Kværner Works was based.

Hiorth was not the sole buyer, of course. He belonged to a consortium consisting of a group of influential men in the capital that financed the purchase. The consortium consisted of Andreas R. Lind, who was a co-owner in the trading firm of A. Hiorth,⁹¹ and who was also Hiorth's brother-in-law. Other participants in the consortium were shipowner Thomas Fearnley and the CEO of Christiania Telephone Company, Knud Bryn. Evald Rygh was also a member of the consortium. Rygh had been finance minister in Emil Stang's government from 1889 to 1891, and he had been mayor of Kristiania from 1880 to 1889.

The consortium's ambitions for Kværner Works were extensive. In the initial public offering for the new corporation, which was announced in April 1892, it was stated that existing areas of production would be expanded.⁹² But entirely new areas of production would also be initiated, and "electrical machinery, paper mill machinery, railroad freight cars and locomotives" were mentioned in particular. The production plants would also be modernised and expanded. The ambition was, as stated in the offering, to convert Kværner to a "first-class workshop with machinery for 500 to 600 workers, with fully modern equipment operating at the lowest possible cost." New areas of production would thus go hand in hand with efficiencies of operation.

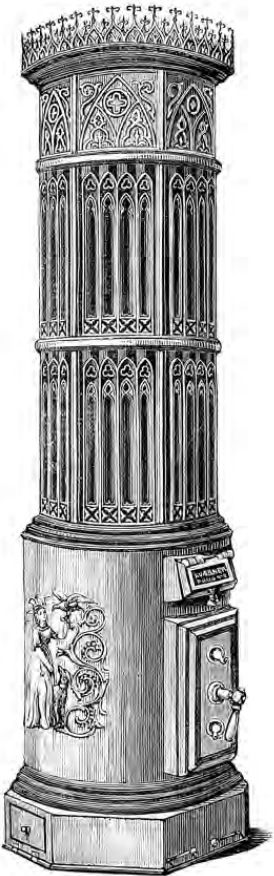
Kværner Works with the new machine workshop that was finished in 1894. Vålerenga School can be seen in the background.



According to the stock offering, the consortium planned to purchase Kværner Works – including land, buildings and equipment – for about 750,000 kroner. In addition, modernisation would cost at least 100,000 kroner and possibly a good deal more. Another 150,000 kroner would be spent on purchasing machinery and equipment at Rodeløkken, which in conjunction with the purchase would be transferred to Kværner. Finally, the corporation would need operating capital. Altogether, the consortium planned on a capital requirement of 1.2 million kroner.

Initially they operated with a minimum capital of 800,000 kroner. Of this, 360,000 kroner was already earmarked in advance at the time of the stock offer, and the members of the consortium contributed the majority of the funds. In addition, Hiorth invested 100,000 kroner in the form of an instalment towards the purchase price of Rodeløkken. Onsum's estate also bought in as a shareholder for 340,000 kroner of the purchase price. With this the minimum limit for the stock capital was reached, and the Kværner Works Corporation was established on 17 June 1892. The next day Hiorth was hired as managing director. At the same time, wholesaler Conrad Anker was elected as the first chairman of the board, while Evald Rygh and Andreas Lind were elected to be members of the board of directors.

The "ventilation stove" from the 1890s. The stove was more than 2.5 metres tall.



Good times for the foundry industry

So what did the change in ownership mean for the portion of the Kværner company which is the focus of our presentation? At first, not very much. Indeed, it was machine production that was central to the modernisation over the ensuing years. As of spring 1894 a total of 400,000 kroner was spent on expansion and modernisation, and most of it was used for the construction and outfitting of new machine halls. But the stove division was partially renovated as well. For one thing, a transport rail system was built with wagons that facilitated transport between the various production processes in the foundry. The rail system was also connected to the warehouse where the casting moulds were kept. In this way transport was made more efficient at the same time that it eased working conditions for the manual labourers and assistants. A newly designed polishing machine was also purchased for the stove workshop to polish the stove cylinders. The machine ensured a better, more attractive product while it helped save man-hours.

What financial significance did the stove division have for Kværner Works in the period just before and after 1900? Anker Olsen writes about Kværner Works in 1990 that “stoves and other cast-iron goods for residential construction were still a very important part of production”.⁹³ We do not have concrete figures on the scope of production or the financial results in the individual divisions for this period either. But for the stove foundry there is reason to believe that the 1890s represented a good period overall. In this decade, for instance, the population of Kristiania climbed by a total of 47 per cent. This meant feverish construction activity and good market conditions for suppliers of building materials. The latter part of the decade exhibited a major boom in residential construction and property in the capital.

Even the stove foundry at Kværner was, however, hit by the so-called Kristiania crash of 1899, which marked the end of the construction boom. Results were weak for some years after 1900, and in fiscal year 1904-05, which probably represented the lowest point, the operating profit was only 5,850 kroner, according to Anker Olsen.⁹⁴ After 1905, however, the market began to revive. The

period from 1905 to 1914 was marked by strong, steady growth, which also prompted good turnover in the stove market.⁹⁵ There is much to indicate that the stove foundry at Kværner expanded quite rapidly during this period. For one thing, the number of employees increased considerably. A report from 1904 shows that the foundry had about 45 employees. By 1914 that number had increased to around 85. This corresponded to about 20 per cent of Kværner's total work force. Throughout the First World War (1914–1918) the number was presumably even higher.⁹⁶ In 1916 it was reported that the capacity of the foundry for the past few years had been fully utilised.⁹⁷ Finally, we know that the stove foundry operated with a large profit in the first years after it was sold. There is little reason to believe that things were any worse in the years immediately preceding the sale.

Kværner Works are modernised

Consequently, the stove division must have been an important source of income for Kværner Works. But this did not change the fact that the division in the years before the start of the First World War in 1914 was in the process of becoming a more peripheral part of the company. As we have seen, after 1905 Kværner began placing greater emphasis on machine production. Consequently, operations that were not directly related to the main areas of focus were consigned to the background. This policy had particular significance for the stove division.

The historian Knut Kjeldstadli has studied the reorganisation of the Kværner company in these years and writes as follows: "Around 1900 Kværner was a diversified and somewhat old-fashioned company. The operational activities were all organised under manufacturing, with a single management, and the tempo and style were almost pre-industrial. After the conversion it became a specialised workshop, mechanised and electrified, with a modern, cohesive operating organisation."⁹⁸

Perhaps the most important single measure taken in this period was the introduction of a new administrative structure in 1913. At the same time this reorganisation illustrated the position that the stove foundry had attained.

The administrative reform of 1913 basically consisted of three elements: the remodelling and new technical outfitting of the divisions, a new operating organisation based on a more bureaucratic and formalised decision-making structure, and new systems for accounting and calculation. The background for the reform was that by this time Kværner had grown so large that it was difficult to create clear lines of command amongst the various divisions, and between the individual division and management. One of the purposes of the reform was to ensure better utilisation of the production apparatus and more precise project calculations through plotting the costs associated with each individual division and product.⁹⁹

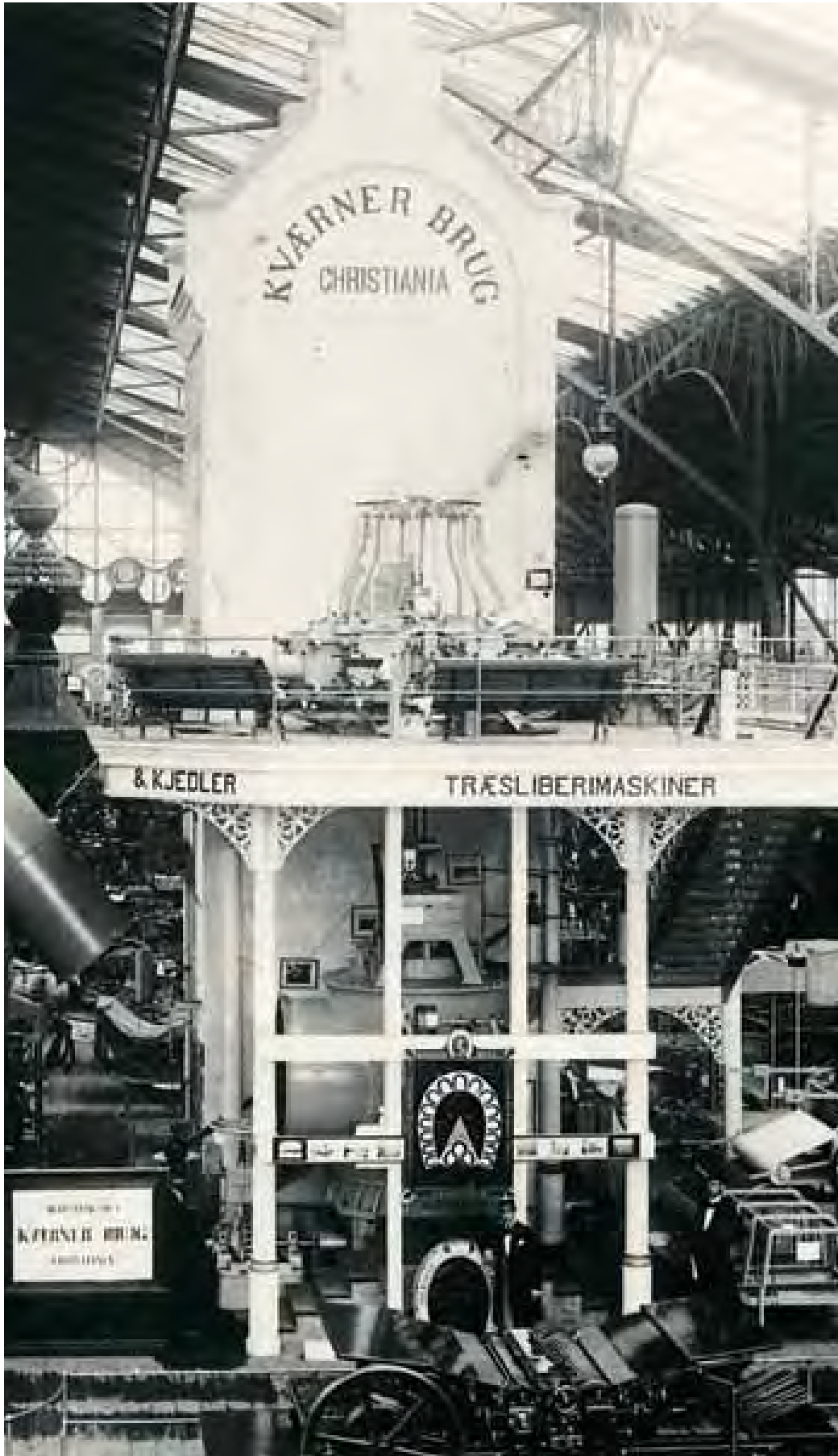
The stove foundry, however, was the only division not included in the reform. There the old organisational model was retained, and there was no emphasis placed upon modernising the production apparatus or rationalising operations in any other way. This was probably due to the fact that the stove foundry was not integrated into the rest of the operations as the other divisions were. For this reason the need for conformity was not as great. But the situation also indicates that the division was no longer included in the company's plans for the future. As Anker Olsen writes, "The

Cylinder stove from the 1890s.



From Kværner Works' pavilion at the industrial exhibition in Stockholm in 1897. By then the wood products industry had become the company's most important new market, although efforts were made in many other areas as well. In the lower foreground a newspaper printing press can be glimpsed.

Kværner's exhibition pavilion attracted a great deal of attention and demonstrated that in many areas Norwegian industry was on a par with Swedish industry.



old Kværner was left there as an isolated complex at the site where the stove foundry operated. The stove division was topographically, administratively and technically an annex with no organic connection to the other operations of Kværner Works.”¹⁰⁰

It is possible that Kværner’s management was already working on plans to sell the stove foundry as early as 1913. But it is also possible that it simply allowed the division to go its own way as long as it was profitable, but without investing any ambitions or resources in it. At any rate it does not seem as if there was an active effort to sell off the division. A sale was first mentioned in the autumn of 1916, and only because a buyer had made an appearance.

On its own feet

Sometime during the autumn of 1916 Kværner’s purchasing chief, Herman Anker, announced that he wanted to purchase Kværner’s stove foundry. We do not know how the ensuing negotiations between Anker and Kværner’s management proceeded, but apparently they were quite painless. In November of the same year the parties had reached an agreement which stated that the stove foundry would formally become independent as of 1 January 1917. The purchase price was 446,000 kroner. This sum included the foundry and associated buildings, machinery and other inventory, 24 acres of land, patterns and patents, and warehouse stock. Of this amount, 246,000 kroner would be paid in cash, while the rest would be converted to an interest-bearing mortgage bond.

Who was this man behind the purchase, and what was behind his desire to become a foundry owner? Herman Anker was young, only 26 years old in 1916, but he had already established a career for himself in the Kværner company. He had a mercantile education, and after finishing his studies in 1910 he started as a secretary in the company’s purchasing department. Here he apparently soon attracted attention as a talented staff member. As early as 1913 he was appointed head of purchasing for the entire Kværner company, in conjunction with the implementation of the new administrative organisation. At the time he was only 23 years old.

Anker’s interest in the stove industry was no doubt based on his family background. He was related to Peder Anker – the first prime minister after Norway’s detachment from Denmark in 1814, and owner of Bærum’s Iron Works, which had long been the country’s largest manufacturer of iron stoves. By all accounts, even as a youth Herman Anker was fascinated by the history of the old family factory and the traditions of the stove industry. It was probably this interest that led to his desire to acquire the stove foundry at Kværner Works.¹⁰¹

There is doubtless some truth to such an explanation. Several things indicate that Anker entertained a special interest for the old Norwegian stove culture. He often talked about the need to reinstate the artistic traditions of the old iron works in the Norwegian stove industry. And later on he also spent considerable effort in promoting historical knowledge about the old-time Norwegian stove culture. Indeed, he was the one who took the initiative with the great 300-year anniversary of the Norwegian stove industry in 1924; on the same occasion he commissioned an anniversary book about the stove production of the old iron works.¹⁰²

Herman Anker, founder of Kværner Stove Foundry and the driving force in its early years as an independent company.



The administrative director of Kværner Works from 1900, Hans Gerhard Stub. It was Stub who was responsible for directing Kværner towards the manufacture of turbines and who made the company the leader in this area in Norway.

However, nostalgia was not the only thing that drove Anker. As we shall see, he also represented a highly modern and future-oriented type of industrial leader. He had a keen interest in rationalisation and efficiency, in market-driven product development, and in new ways to organise the business. In addition, the purchase of the stove division was a financially sound investment – despite everything the stove foundry was going very well.

Anker was, however, not solely responsible for the purchase. The company was to be organised as a corporation, and Anker had gathered together a consortium which was to invest capital. It consisted of the firm P. Schreiner & Co., director Jonas Skougaard Høy, supreme court attorney Nils A. Petersen, Thomas Glad, Jacob Swensen, wholesalers Ludvig Foss and Anthon Bernhard Laurantzson, and Albert and Fredrik Hiorth, the latter being the same man who had managed Kværner Works from 1892 to 1900. Altogether they invested about half a million kroner.

Additional capital was required, however. According to the plan, large investments in modernisation and expansion were to be undertaken, including almost doubling the production capacity. The share capital was thus set at 800,000 kroner. The amount that was not already subscribed was to be raised through a public stock offering. It was offered in December 1916.¹⁰³ Within a few days the share capital was fully subscribed.

The statutory general meeting was held on 12 January 1917. Twenty-nine shareholders were registered, of which 15 attended the general meeting. The promoters presented proposals for by-laws which, after minor changes, were adopted unanimously. These established that a general meeting should be the highest organ in the corporation. The general meeting would appoint the president and elect members of the corporation's board. It would also determine the utilisation of the corporation's profits. However, the by-laws stipulated that these profits as a basic rule should be paid out at 6 per cent of the share capital. In addition, the board should receive 10 per cent as a bonus.

As we can see, the shares were dispersed to a good number of hands. But a narrower circle of individuals soon formed which appointed themselves as the leaders of the company. Anker, naturally, took on an important central position. He was the entrepreneur, presumably one of the largest stockholders, and the very man to be president of the corporation. Moreover, he was to have a permanent position on the board. The attorney Nils Petersen became a central member of the board in the early years, as did director Skougaard Høy. Definitely the most important individual beside Anker, however, was wholesaler Anthon Bernhard Laurantzson. He was one of the largest shareholders, and he became the first chairman of the board – a position, by the way, that he held almost continuously until his death in 1952. Engineer Fritz Frølich must also be mentioned; he became a shareholder and member of the board in the mid-1920, but remained on the board until after the Second World War.

World War and prosperity

Kværner Stove Foundry was created during a time when the world situation was far from normal. Two and a half years before the company was founded, in August 1914 to be precise, the First World War had broken out, and by New Year's of 1917 war was raging all over Europe. Even though Norway during the entire war was amongst the nations which chose to remain neutral, the war



Wholesaler Anton Bernhard Laurantzson was involved in the formation of Kværner Stove Foundry in 1916 and became the corporation's first chairman of the board - a position he held almost without interruption until 1951.

had a great effect here as well. Most noticeable were the shortages in consumer goods. Throughout the war years the belligerent nations reduced their export of goods. This was also true of Great Britain, which was Norway's most important trading partner. In addition, commercial shipping – including that under neutral flags – was affected by the war on the high seas. The consequence was that to a large extent the international trading system broke down.

For a small country such as Norway, which was completely dependent on imports, this had a very noticeable impact. Lower imports resulted in both shortages and price increases. In the cities many products became the object of speculation, and some disappeared altogether from ordinary trade. It was a time of high prices. Problems also struck the business community. Prices of raw materials and production equipment rose sharply. And in the latter part of the war, the import of energy was also greatly reduced, which had serious consequences for both business and home. Never before had Norway been so dependent on imported energy – primarily coal and coke – than in the years of the First World War. Of the total energy consumption in Norway in 1914, imported fuel accounted for about 70 per cent. Towards the end of the war the share had fallen to 40 per cent.¹⁰⁴

From the assembly department in Kværner Works some-time between 1905 and 1910. Here King Stoves are being assembled and readied for sale.



The price increases and the lack of energy and other component materials also affected the foundry business. In the latter part of the war there was a great shortage of coke and cinder, and at times it was also difficult to obtain pig iron and scrap iron. These were problems that Kværner Stove Foundry also had to face throughout much of the war and in the first years afterwards. Operating costs climbed sharply, and at times it was difficult to keep operations running because of the shortages of coke and pig iron.

A comparison of the prices of the most important components in 1914 and 1918 illustrates the scope of the price increases. In 1914 a tonne of cinder cost 22 kroner in Kristiania. A tonne of scrap iron cost about 45 kroner, and a tonne of pig iron about 50 kroner. By 1918 the prices had risen to 300 kroner, 250 kroner and 600 kroner, respectively. In the course of less than four years cinder had become 14 times as expensive, scrap iron almost 6 times as expensive and pig iron 12 times as expensive. In addition, wage costs rose, although not as sharply as the prices of raw materials. The average wage for a skilled worker in a foundry in Kristiania went up from 47 to 84 øre an hour in the years between 1914 to 1918. For assistant labourers it went up from 36 to 72 øre.¹⁰⁵ Hence the wage increase was far from comparable with the price increase for raw materials. On the other hand, wages were the largest entry in the operating budget.

The majority of increases in the prices of raw materials took place during the latter part of the war. It was not until the beginning of 1916 that the price rise for iron and coke became noticeable. Towards the end of the same year it started to be difficult to obtain such goods. "The delivery of pig iron [has been] restricted significantly and partially come to a complete halt from England and Germany... There have been similar difficulties in obtaining cinder," wrote the National Stove Foundry Association in the autumn of 1916.¹⁰⁶ In this connection, however, it may seem that Kværner Stove Foundry was quite well situated. Along with the purchase of the foundry at the beginning of 1917 came a stock of raw materials that would last for at least one year at full production.¹⁰⁷ In addition, the company managed to buy more lots of pig iron from Tinfos iron works and Arendal smelting plant towards the end of the war.¹⁰⁸

In spite of the many problems created by the war, this was a good period for Kværner Stove Foundry from an economic point of view. First, the demand for stoves climbed sharply throughout the war years. The shortage of coke caused many people to exchange their coke-burning stoves for wood-burning stoves, while the rising fuel prices led many to exchange old stoves for new, more fuel-efficient ones. Second, the higher production costs were largely offset by price increases. As with many other products, prices for cast-iron goods of all types rose considerably during and immediately after the war.

The first price increase at Kværner Stove Foundry was initiated in the summer of 1916, just as the prices of raw materials took a turn upward. The price rise was 20 per cent. But new surcharges soon followed. In October of the same year prices were raised another 25 per cent. And in January and June 1917 additional surcharges were added of 55 and 25 per cent, respectively.¹⁰⁹ In less than a year, prices had risen by 125 per cent.

Price increases were obviously necessary to compensate for the increased production costs. On the other hand, it seems likely that the opportunity was seized to increase earnings. At any rate, Kværner Stove Foundry was producing at full tilt during these years. For the operating year 1917 the accounts were totalled up with a profit of 306,500 kroner. This corresponded to a return on capital of 38 per cent. In 1918 profits were 258,000 kroner, and in 1919 they were 267,000 kroner. However, most of the profits were put back into the company. In the years from 1917 to 1920, share dividends were never issued at more than 10 per cent.

Norwegian Machine Industry Ltd [Norsk Maskinindustri A/S]

The years during and just after the First World War were therefore good ones for Kværner Stove Foundry. They were also good for large parts of the Norwegian business community in general. In spite of the problems that resulted from the shortage of imported raw and finished materials, the period was primarily marked by a strong economic boom. The merchant marine was experiencing an unprecedented period of prosperity, as were large sectors of industry. Because the belligerent nations had largely converted to war production, the export of Norwegian industrial goods rose at the same time that competition from foreign industry on the domestic market diminished. Profits in the overseas economy rose dramatically, and the earnings created a cash surplus of unprecedented dimensions. In this situation many capital investors lost their aversion to risk, and money was invested in a huge number of both plausible and implausible projects. In the years 1915–1920, 1600 new corporations were established in Norway, and at the same time the share capital in Norwegian businesses was tripled.¹¹⁰ Over 1300 stock brokerages were started during the period from 1914 to 1918 to handle the increased investment activity.¹¹¹

Norwegian Machine Industry Ltd [Norsk Maskinindustri A/S] was one corporation that was formed on the surge of the economic upswing, the cash surplus and the general optimism in these years; it would also come to be significant for Kværner Stove Foundry. This corporation was established in late 1917 as a merger of two of the country's largest mechanical workshop companies – Thune's Mechanical Workshop and Hamar Iron Foundry and Mechanical Workshop. Over the next few years the company grew to be a major firm by Norwegian standards. This occurred mainly by the acquisition of a number of established Norwegian companies, but also through starting new companies. Norwegian Machine Industry became one of the country's largest industrial conglomerates, and one of the first of its type in Norway. We shall now take a closer look at the formation of this company, because Kværner Stove Foundry was one of the many companies that was included in the merger.

Norwegian Machine Industry was not a phenomenon of speculation like many of the castles in the air that were created in the years during and just after the war. As we have seen, large established companies entered into the merger; the same can be said of several of the companies that were added later on. From this perspective, Norwegian Machine Industry had substance. At the same time there was a clear industrial vision behind the creation. The purpose of the corporation was, as stated in the stock offering, "to institute and utilise the advantages of industrial co-operation amongst various companies and – where such might be found favourable for the exploitation of industrial opportunities – employing any methods to start, operate, purchase, participate

in, support or finance industrial enterprises of interest to industry, and operate any business whatsoever to promote these objectives, including trade".³¹²

The goal was thus to promote co-operation between companies, primarily by creating opportunities for the rationalisation and efficient organisation of administration and production through such co-operation, or as it was stated in the offering, "through co-operation or joining forces with different companies to exploit advantages of various types, such as the advantages of specialisation, combined purchasing, reduction of costs and simplification of administration, etc."

Norwegian Machine Industry therefore built on the idea of industrial integration. The group's primary objective would be to join forces with similar and disparate companies in the iron and metal industry. Within the group, former competitors would give up portions of their production to the benefit of other companies, and in turn would receive exclusivity in other fields of production – what is called horizontal integration. In this way larger production series and more uniform production would be achieved in the individual company, which in turn would promote advantages of scale. Furthermore, an effort would be made to combine companies at various levels in the production chain, what is called vertical integration. By joining with a group of companies

From the foundry sometime in the 1920s. Casting is still being done in two-part sand moulds on the floor. Moulds ready for use are in the foreground.



which together covered a wide field of the machine and iron industry, one would be as self-reliant as possible with the semi-fabricated items on which each workshop was dependent. By freeing oneself from independent subcontractors, one would avoid a costly link in the chain of production, and at the same it would be easier to co-ordinate production between the various links. Finally, there would be much to gain in economy of scale through consolidating the administration.

The responsible parties behind Norwegian Machine Industry were obviously inspired by the trend towards rationalisation which had won increased acceptance in Norwegian industrial circles in the years before the First World War. The impetus for this came mostly from American industry, where modern management models (scientific management) and new production organisation (the assembly line) had gained prominence after the turn of the century. A few Norwegian industrial companies had adopted elements of these organisational principles quite early; one of them was the new administrative arrangement that we saw introduced at Kværner Works in 1913, inspired by American organisational principles.¹¹³ Norwegian Machine Industry, however, represented a step further on this road. In Norway rationalisation and increases in efficiency had largely been restricted to measures taken in individual companies. What was new about Norwegian Machine Industry was the idea of rationalisation through integration of different companies.¹¹⁴

The basis of Norwegian Machine Industry was therefore an idea about rationalisation through co-ordination and large-scale operation. But how were owner relations envisioned between Norwegian Machine Industry and the individual member companies? And how would the consolidation proceed in practice?

The plan was for Norwegian Machine Industry to acquire the majority share in the companies that joined the group. This was done in the case of the two companies that formed the cornerstone in the group, Thune's Mechanical Workshop and Hamar Iron Foundry and Mechanical Workshop; the same relationship was instituted with the companies that joined later. However, the companies would consist of independent entities, and they would continue to have their own board and management. But the members of the board of Norwegian Machine Industry would also be on the boards of the subsidiaries, so that the mother corporation in practice would have the decisive word in most matters of importance.

The mother corporation would assume all the functions in the subsidiaries that could be centralised. This applied to most mercantile tasks such as purchasing, auditing and accounting, statistics and advertising. Further, the mother corporation would be responsible for production planning at the individual companies, and co-ordination of production amongst them. In addition, the mother corporation would be the companies' face to the outside world; for instance, all sales would take place through a combined sales department in Kristiania subordinate to Norwegian Machine Industry.¹¹⁵

During 1918 a number of companies joined the group, and by early 1919 it had become one group with 16 subsidiary companies. The share capital was revalued upwards in step with the expansions and acquisitions. The original share capital of 12.5 million kroner had become 32 million kroner after two years.¹¹⁶



Galley from Kraakerøy Foundry and Workshop, manufactured in 1920. Kraakerøy merged with Kværner Stove Foundry and Aadal's Works in Løten in 1920 to form the sales corporation Jøtul Ltd. The company was to be a sales corporation shared by the three foundries.