by Anker? Was there anyone who had the qualifications necessary to lead a company like Kværner Stove Foundry and who was willing to take over the leadership of a company in its present condition?

There was. It did take almost a year before Kværner Stove Foundry formally had a new managing director. But a leader had already crystallised a good while before that time. Immediately after Anker passed away, the office manager of Jøtul Ltd, 32-year-old Johannes Gahr, was taken into the management of the company. Gahr's first task was to continue the company's day-to-day operations until further notice. He took over the company's proxy, and at the same time he began meeting with the board.

Gahr's entry into Jøtul Ltd had proceeded through Norwegian Machine Industry. In 1916 he was hired by Thunes Mechanical Workshop at the age of 21. The next year Thune merged with Norwegian Machine Industry, and Gahr was then given the responsibility of organising the foundries in the coalition. In this way he made contact with Anker, and when Kværner Stove Foundry left the coalition in 1920, Anker took Gahr with him into Jøtul Ltd.

Gahr must have seemed a natural choice. He was very familiar with both Kværner Stove Foundry and Jøtul Ltd. He had been employed as office manager of Jøtul Ltd since its founding in 1920 and had been Anker's closest subordinate there. In recent years he was also Anker's deputy, and on some occasions he attended board meetings. He had also taken on a number of assignments for Kværner Stove Foundry.

Gahr was formally hired as the new managing director in December 1928. It would prove to be a fortunate choice. In the coming years the situation in the company would turn from crisis to new growth. This occurred through a combination of economic reorganisation and restructuring of the production system. Over the period from 1929 to 1931 the company was refinanced and new capital was supplied. At the same time the operations were effectively rationalised through a fundamental technological and organisational restructuring of production. These reorganisations brought rapid results. As early as 1931 Kværner Stove Foundry was operating at a profit, and over the next few years the company gradually strengthened its finances.

As we shall see later, it was Johannes Gahr who was the strategist and driving force behind the reorganisation in these years. He was the one who arranged the refinancing of the company. And he was also the one who took the initiative in the technological reorganisation and all the rationalisation measures.

Kværner Stove Foundry's new strong man. In 1928 Johannes Gahr took over as managing director after Herman Anker passed away the year before. It was Gahr who initiated modernisation in 1930 and who secured the financing for it. Gahr was an unusually talented marketing strategist but he also had a strong production orientation. It was this ability to combine marketing and production that formed the basis for the great success Jøtul would later enjoy.

Refinancing and new opportunities

As circumstances developed in the second half of the 1920s, it is scarcely believable that Kværner Stove Foundry had survived without comprehensive debt relief. From this perspective, it was the administrative board of Klaveness Bank that saved the company from ruin. But it would take more to lift the company out of its difficult situation. As mentioned, there was a lengthy search to find someone who was interested in taking over the company's remaining debt in Klaveness, and past connections to that bank made it difficult to raise fresh capital.

Not until the end of 1929 did Kværner Stove Foundry manage to find a solution to the financing question. However, the company had to go outside the ordinary financial network to find capital. During 1929 a consortium was assembled that would take over the loan in Klaveness and simultaneously infuse a good deal of new capital into the company.

Unfortunately we know little about who participated in the consortium. Nor do we know on what conditions the loan was taken over from Klaveness, or what obligations Kværner Stove Foundry had to assume with regard to the consortium. What we do know is that it was Johannes Gahr who managed to put the consortium together. Presumably it must have consisted of men with whom Gahr either had personal ties or some kind of trust relationship. In spite of everything it was still a company which hardly could have seemed a particularly solid debtor. This is why it is also reasonable to surmise that it must have been rather wealthy men who participated. After all, a significant debt was involved.

Gahr's role in conjunction with the consortium comes into clear view in relation to the way the board handled the matter. As far as we can see, the company's main shareholders Laurantzon and Frølich did not take part in establishing the consortium. And it is Gahr who appears as the consortium's representative to the board. [171]

For Gahr the refinancing itself was not a goal per se. Rather, it was a means of implementing a comprehensive modernisation of the production apparatus. This was why the consortium also had to infuse new capital into the company. Outfitting was necessary anyway because after many lean years the production equipment was well-used and in need of replacement. At the same time plans were afoot that included much more than outfitting based on traditional production technology. Immediately after the refinancing was arranged, the company began to evaluate several radically new technical production solutions. The company's search process finally led to a decision to introduce a completely new production system – so-called "continuous casting". This system built on a radically new method of organising foundry production, primarily because it was based on a much more intense degree of automation and mechanisation.

We shall now look more closely at what led Kværner Stove Foundry to focus its efforts on continuous casting, and what consequences the introduction of this system had for production and profitability. First, however, we shall take a closer look at the technological level the Norwegian foundry industry in general had achieved by 1930. It is only through describing the situation that the radically new aspect of Kværner Stove Foundry's technological restructuring can be fully understood.

The Norwegian foundry industry and its technological backwardness

In the inter-war period, and especially in the 1930s, Norwegian foundrymen were preoccupied with how productivity could be raised in Norwegian foundries. Naturally this was connected with the generally difficult conditions in the workshop and foundry industry, which was also constantly encountering strong competition from abroad. When it came to the Norwegian foundry industry in particular, there was a general view that it was old-fashioned and poorly mechanised when compared with foundries in other countries. Certainly no one expected Norwegian foundries to be comparable with the foundry industry in the large industrial countries. But even by Scandinavian stan-

dards it was lagging behind the times. It was commonly believed that both Swedish and Danish foundries were overall more modern and efficient than the Norwegian ones. [172]

What was the reason for this backwardness from the point of view of Norwegian technical experts? Most of them linked it to lack of organisation. The casting process consisted of a long and complicated series of different but closely related work procedures. In Norwegian foundries, however, the work cycle was often poorly co-ordinated, which resulted in poor utilisation of both the work force and the production equipment. In addition, work assignments were often inappropriately distributed. For instance, it was normal for skilled workers, the most expensive part of the work force, to deal with tasks that could have been done by unskilled assistants or labourers. [173]

One of the country's foremost foundry experts, engineer and consultant at the National Institute of Technology [Statens teknologiske institutt], Torolv Krogvik, was of the opinion that the iron foundries needed to adopt a more systematic organisation of their operations. More precise formulation of tasks, increased co-ordination of the various production processes, more formalised work instructions, and increased efforts to define individual jobs were measures that would raise productivity. [174]

Casting of small items on the floor. We can see that the moulds are filled with molten iron from the ladle that is handled by two men. The gases in the filled moulds are burned off.

Others also stressed the use of time and motion studies as a decisive factor in the rationalisation of operations.[175]

Rationalisation of the operating methods was closely associated with increased mechanisation. Special emphasis was put on the great potential that many foundries possessed in making transport conditions efficient. In a foundry, transport was a critical factor in the work processes. Heavy materials such as patterns, moulding sand, iron and goods had to be moved about innumerable times in the course of a casting process. Most foundries had indeed adopted cranes and other lifting devices for such work, but it was still not unusual for a good deal of the transport to be done manually. In addition, the foundries were often not physically designed to allow the use of cranes in the whole production hall.[176]

In the countries where casting technology had been most advanced, such as the United States, France and Germany, foundries had adopted radically new transport technologies in the 1920s. The most significant single advance in this regard was with systems for so-called continuous casting. These systems were based on continuous assembly lines in which the work piece – the casting mould – was transported from one operation to the next without interruption and over short transport distances.[177] The assembly line connected the various work processes and at the same time determined the tempo of the work cycle. The system also made it possible to define the individual tasks quite precisely, and this in turn promoted increased division of labour. Each worker received more defined tasks, and he carried out only one or a few operations. In this way the demand on the workers' skills was less, and they became more specialised within the confines of their work areas.[178]

Increased specialisation also made it possible to get along with fewer skilled workers. This was considered a great advantage at a time when labour conflicts were rife. "This feeling of dependence on the work force is one of the main reasons for the now commonly instituted specialisation of foundry products. One thereby achieves an increased use of machinery in conjunction with mass production of objects. For this purpose, an unskilled work force is often equally useful. An unskilled labourer with a penchant for this type of special work will be a more loyal man than the fully trained moulder who will seize the first opportunity to move to a job where he can better utilise his knowledge", wrote Jernindustri [Iron Industry] in 1926.[179] The position of the skilled workers was quite strong, and specialisation might play a role in loosening their grip on the company.

Kværner Stove Foundry introduces continuous casting

Continuous casting was not appropriate for all types of foundries. The system required production of a certain size. It also had to be somewhat uniform. Finally, the system was expensive to construct. By the start of the 1930s there were still no foundries either in Norway or the rest of Scandinavia that had adopted it. In Norway, however, one foundry at that time was planning such a conversion. It was Kværner Stove Foundry.

We do not know exactly what prompted the management of Kværner Stove Foundry to consider such a conversion. But there is reason to believe that the plans emerged as a result of an interaction amongst Gahr, Kværner Stove Foundry's operating engineer Arne Krogvik, and Torolv Krogvik at the National Institute of Technology. Gahr was very keen on finding more rational operating methods,

and obviously envisioned that this should be done through increased mechanisation. He found support for his ideas from the engineer Arne Krogvik, who unlike most other engineers in the foundry business was a mechanical engineer. This meant that Krogvik naturally gravitated towards process technology. He was also a talented expert in his field. He kept up with technical developments in the domestic and international foundry industry. He participated actively in the Foundry Technology Association [Støperiteknisk forening] – the field's technical body. And he gave lectures and wrote articles for various technical journals.

Arne Krogvik was also the brother of Torolv Krogvik. The latter was one of the experts in Norway who knew most about technological development in the international foundry industry. In the 1920s he made a number of study trips to foundries in the United States, Germany, Great Britain and other countries. He passed on his experiences to the field here in Norway, through his consulting office, lectures and articles. There is good reason to believe that the two Krogvik brothers had close contact on technical matters. In that case it was conceivable that Kværner Stove Foundry had greater access to information on various operating alternatives than did other foundries. In any case Torolv Krogvik influenced what alternative would be chosen.

Continuous casting is introduced. Here is a picture from the moulding site in the large casting hall, with the conveyor belt.
The system contributed to a dramatic increase in production efficiency.

The photo shows the huge sand silos where the moulding sand was tapped down into the two-part moulds. Then the moulds were moved by conveyor belt to the melting furnace.

But no decision had as yet been taken. The technology was not yet completed or ready to put into the production halls. First a rather demanding and lengthy investigative process had to be undertaken. It started at the beginning of 1929. In February of that year, Johannes Gahr, Arne Krogvik and foundrymaster Oscar Evensen travelled to a foundry just outside Stockholm. The objective was "to study a new transport arrangement and a new operating method".[180] We do not know what type of system was involved, but it was later labelled uninteresting.

The summer of the same year Gahr and the Krogvik brothers began to discuss systems for continuous casting, and it was decided that Torolv Krogvik would work up "a detailed report concerning a new operational layout for the foundry". The report was presented a few months later.[181] It was based on experiences from a study trip that Krogvik had recently taken to Germany. There he had visited several foundries that had installed continuous casting, and he was now convinced that this system would work well for Kværner Stove Foundry. Krogvik pointed in particular to two advantages of the system. First, the system would mean great savings in the work force. Second, it made possible, as we have seen previously, increased specialisation of both work tasks and production.

After Krogvik had prepared his report, Gahr himself went to Germany to see the system in action. That was when he must have become convinced. The decision to adopt continuous casting in Kværner Stove Foundry was taken immediately after Gahr returned home. Planning began at once. Arne Krogvik led the project, but in close co-operation with Torolv Krogvik, who served as an external consultant. In the spring of 1930 machinery was ordered from Germany and Great Britain, and in the fall the assembly work began. By the beginning of 1931 the new plant was ready for operation.

Automation totally changed the work cycle in the foundry. An electrically powered suspended assembly line 220 metres long snaked through the entire foundry plant. Trolleys were fastened to it, and to these in turn were fastened transport tables. On these tables the two-part mould flasks were transported around the foundry. The transport tables were also designed as tiltable hoisting gear, and in this way they could also transport mould flasks and moulding sand. The work cycle was thus made much more efficient and much less arduous. The transport tables passed by the moulding site at knee height. There the moulds were raised up to the table by means of cranes. Then the mould flasks were sent on the conveyor belt up to the cupola furnaces, which were also new. From the furnaces the iron poured uninterrupted into a tiltable forehearth. From here the iron was then tapped off into hand shanks and poured into the moulds which lay on the conveyor belt. After the pour, the belt then climbed into the air and went up under the ceiling along the cooling section to the site for offloading. Twenty minutes after the casting itself the moulds arrived at the emptying site, where emptying occurred on a machine-driven shaking grate. The empty flasks were lowered back to the transport table and conveyed back to the moulding site. The cast objects proceeded from the shaking grate and over on a conveyor belt that led to the polishing room.[182] That was the end of the process.

The number of workers could be reduced significantly after automation. In particular the need for manual labourers and other unskilled workers was sharply reduced. But the number of moulders could be cut back as well. Estimates showed that the same production quantity could be manufactured with a work force that was about 30 per cent smaller.[183] In addition, the production system could be utilised much more efficiently. Previously it had only been possible to cast for about two hours of the work day, while the rest of the time was spent in preparation and planning. After conversion, on the other hand, it was possible to cast during the entire work day. Finally the system gave the management increased opportunities to exert control over the workers. Specialisation defined the work tasks more clearly, and thus it was easier to measure the work put out by each individual. In addition, the assembly line structure offered greater opportunities to define the work tempo. The speed of the conveyor belt defined the work cycle, and the workers had to adapt to it.

For the workers the conversion meant a restriction of individual control over their work, which clashed with long-held traditions in the field. Traditional foundry operation was marked by a strong skilled worker culture that allowed the individual great influence over his own work situation. Nor did automation occur without resistance. There were limits as to how far the plant management could go. On several occasions conflicts arose when the speed of the conveyor belt was increased, and as a rule management had to back down. At other times increased tempo was compensated for by higher wages, and not always voluntarily on management's part. In 1933 the speed of the conveyor belt was raised without conferring with the workers. Yet management refused to compensate for this with higher wages, and the workers went on strike. The dispute resulted in the dismissal of 40 men, but after the Moulders' Union [Formerforbundet] entered the fray, management had to back down. The speed was not reduced, but the workers received compensation through higher wages.[184]

Automation probably created a certain feeling of alienation. On the other hand, it also held great advantages for the workers. The work load was much less because most heavy lifting was left to the machines. As it was claimed at the time of the conversion: "Much effort has been made to spare the

moulders from heavy lifting work".[185] This was undoubtedly cause for genuine relief.[186] However, we have to be careful not to paint too rosy a picture. Air pollution and heat continued to be serious problems. And the noise problem was actually amplified by mechanisation. Finally, the foundry was still a dangerous place to work. For instance, there was little protection against typical hazards such as molten iron spray, crushing injuries, and the like.

New organisational structure

Mechanisation in the foundry meant closer integration of workers and machinery – for better or worse. On the one hand, mechanisation created a sense of alienation, yet it greatly improved the workers' physical situation.

The introduction of continuous casting thus contributed to structuring and ordering the work cycle. But automation in itself was not the key to solving the problems of efficiency. As we have seen, optimal operation also depended on the correct organisation of production as a whole. A number of work tasks were not physically included as part of the production lines, but were still utterly crucial for the overall system to function efficiently. For example, if a task such as production of moulding sand was not precisely co-ordinated with the work cycle at the conveyor belt, all production would come to a halt. In such a context a highly mechanised system might be a drawback rather than an advantage, since it was much more sensitive to failure caused by a single link in production. As one of the trade's most prominent men said, "One must... be clear that mechanisation in itself does not provide the solution to the foundries' production problems. It is a correct organisation of

The final stage. Here the finished goods are shaken vigorously by means of an electrically driven grating. The casting sand is shaken out of the moulds and automatically cleaned before being sent by conveyor belt back to the casting hall. The cast goods are sent on to the finishing department.

production combined with the right degree of mechanisation that in each individual case gives the best results." [187]

At Kværner Stove Foundry they were obviously aware of this connection between mechanisation and organisation. Simultaneous with the establishment of the new conveyor belt, a complete organisational overhaul was carried out. For this work as well, expertise was brought in from outside.

In the summer of 1932 the deputy chief at Christiania Nail Works, engineer Trygve Lowzow, was hired to work out "proposals for a new operating system". [188] Lowzow had invested a great deal of effort in designing a modern industrial organisation at the Nail Works, [189] and because of this had also won a reputation beyond the walls of the Nail Works. From the end of the 1920s he was employed a good deal as a consultant and lecturer in the field.

One of the major points in Lowzow's organisational model was central co-ordination and control of operations. The key to rational and efficient operation was in establishing one's own planning committees with "command over all the company's departments", as he expressed it on one occasion. In this way all work tasks, from purchasing to inventory, production and sales could be co-ordinated in a rational manner. Furthermore, the co-ordination had to be done with the help of modern mercantile aids – filing systems, calculation, statistics, etc. [190]

It was this type of model that Lowzow recommended for Kværner Stove Foundry as well. In the autumn of 1932 he presented proposals for a complete re-organisation of the company. It was to set up an independent planning department which would be responsible for co-ordinating all job assignments in the various divisions. Work orders, incoming orders for merchandise, inventory, etc. would be managed from here. The department would also carry out ongoing analysis of the work

Skilled workers were eventually in short supply in the foundry industry. Jøtul solved this problem by setting up its own technical school, in which theoretical studies went hand in hand with practical training. The students were taught physics, chemistry, mathematics and mechanical drawing. The photo was taken sometime during the Second World War.

From the "engineering office". Here new stove models and other devices were drawn and designed. Designer Normann Andersen is seen at work at his draughting table.

cycle in the various divisions. Finally it would be conducting time and motion studies, and on the basis of these would present proposals for new and more efficient methods of performing the various tasks. [191]

Over the final months of 1932 the organisational plan was put into practice. Lowzow was an active participant throughout the process. By the end of the year the planning department had been set up, with Arne Krogvik as the manager. Three people were also hired for the department: Olav Enersen, Leif Holmen and Tor Heldal. Holmen and Heldal had mercantile backgrounds, Evensen technical. The reorganisation seemed successful. In a board meeting in February 1933 it was said that the department was functioning "entirely according to intention". [192]

After the modernisation Kværner Stove Foundry took the lead as the country's most modern stove foundry. It was a position the company would retain throughout the 1930s. And presumably it is the basis for claiming that Kværner Stove Foundry in 1931 had reached a higher level of production technology than was normal in most Norwegian foundries even twenty years later. In 1950 the foundries' trade association issued a status report on the Norwegian foundry industry. It concluded that the degree of mechanisation in the foundries was generally low, and that production was not efficient. The report gives the following picture of the typical Norwegian iron foundry: "A purely craftsmanlike operating approach is characteristic of Norwegian iron foundries as a whole. By this we mean above all that the work is not divided into clear stages, but that the same man takes care of almost all work operations." The report also points out that the degree of mechanisation was low. Even simple transport methods were scarce in many places: "As a rule there is a dearth of machinery such as transport trolleys, cranes and sand-mixing machines". [193] The stove foundries were often amongst those that had made the greatest strides towards mechanisation of production. But here too the extent of mechanisation varied greatly. For instance, Kværner Stove Foundry in 1950 was still the only Norwegian stove foundry to have introduced continuous casting. [194]

As mentioned before, Kværner Stove Foundry in the 1930s was experiencing better times. Turnover climbed from one year to the next, and in 1934 it passed one million kroner for the first time since 1925. The results were indeed modest for a long time; on average the company showed profits of about 10,000 kroner annually until 1935. After that, however, they began to climb rapidly. In 1936 profits were a good 39,000 kroner; 71,000 kroner in 1937; and 168,000 kroner in 1938. At the same time turnover passed 2 million kroner. Better market conditions from 1935 on played a significant role in this growth. But the recovery had already begun well before that time. The most important reasons were modernisation and rationalisation of production.

Entering into the Gahr era

Despite the fact that Johannes Gahr played a crucial role in resurrecting the company after 1930, at first he had no significant ownership stake. But this changed during the 1930s, when he gradually became a major shareholder. And by the start of the Second World War he had gained control of the company by ownership.

Gahr became a shareholder in 1929. In conjunction with the refinancing of the company in the autumn of that year, the company's 800 common shares were devalued from 1000 down to 10 kroner, or one per cent of their original face value. At this rate Gahr acquired 33 per cent of the shares, while the remainder was divided equally between Laurantzon and Frølich. The other major portion of the stock, the 75 preferred shares that were owned by Klaveness Bank, would continue to hold their face value, that is, 1000 kroner. But a new group of 269 preferred shares would also be issued, called B shares. They would have the same face value as the other preferred shares, 1000 kroner, and provide the right to dividends before the common shares. Gahr received 107 B shares, while Laurantzon and Frølich received 54 apiece. In addition, the manager of the Jøtul Shop in Oslo, J. Wego, received 54 shares.

Klaveness Bank's block of shares was naturally not beneficial for the other shareholders, since it took priority in the event dividends were distributed. In 1931 the other shareholders reached an agreement

In the late 1930s Jøtul set up its own laboratory, where raw materials and finished products were checked. The laboratory was equipped with the most modern apparatus of the day for chemical and metallographic analyses.

The Industrial Guard at attention. The Industrial Guard was composed of people from the company who were ready to mobilise in case of fire or other dangers.

with Klaveness to convert the block to a loan equivalent to the face value of the shares, that is, 75,000 kroner. The A shares were then devalued to zero in order to create a more orderly share relationship. The same reasoning lay behind the elimination of the 800 common shares, which was undertaken simultaneously. Thus there was only one class of shares left – the B stock. Of these there were originally 266 shares. In conjunction with the changes in 1931, however, the number was expanded to 325. The 59 new shares were not acquired by the existing shareholders, but by new investors. We do not know exactly who these people were, but they must have all been small shareholders. We do know that two or three large dealers obtained stock, including Albert Bøe of Larvik and Malchin Jacobsen of Hønefoss, who had 11 shares each.

Gahr, Laurantzon, Frølich and Wego thus held a total of 266 of the company's 325 shares, while the remaining 59 were dispersed amongst an unknown number of smaller shareholders. However, during the 1930s a greater number of shares was acquired on the owner side, as Gahr became a larger shareholder. This took place as he bought up shares throughout the 1930s from the group of small owners. There must have been a conscious strategy behind these purchases. By 1936 he had succeeded in acquiring all of the 59 shares. This meant that he owned 163 shares, corresponding to 50.2 per cent of the total shares.

This meant that Gahr had taken decisive control of the company in 1936, and after that he was the one in charge. Laurantzon and Frølich remained both shareholders and board members for many years, but the board gradually grew less important, as more and more decisions were taken by Gahr alone. During the first post-war period Gahr acquired the remaining shares. Laurantzon's shares were acquired after he passed away in January 1953. Frølich sold out in 1958. With that, Jøtul and Kværner Stove Foundry became wholly a family business, which it would remain until the end of the 1970s.

During the 1930s Gahr also took on important positions outside Kværner Stove Foundry. In the first place, he was the driving force in the establishment of co-operation within the stove industry in the early part of the decade. He was the one who took the initiative in the so-called "stove arrangement" of 1930, which was intended to regulate price competition amongst the foundries. The arrangement determined the foundries' discount practise to dealers. He was likewise the architect behind the dealer agreement of 1934, which stipulated guidelines for the dealers' discount practise within the foundry group. Gahr was also the vice chairman of the National Association of Stove Foundries for a number of years after 1930.

Gahr's contribution in building up co-operation within the trade sparked attention far beyond the ranks of the industry. It was partly because of this effort that he later assumed key positions in the associations. In 1931 he was elected vice-chairman of the Oslo circle of MVL [Mekaniske verksteders landsforening], the National Association of Mechanical Workshops. Five years later, in 1936, he rose to the top in the powerful national association as chairman. This appointment was conspicuous in several ways. First, Gahr was the youngest person ever to be elected to the post – he was 41 years old in 1936. Second, he was the first in the history of the association to become chairman without having been a member of the main board beforehand. And he held this position longer than any of his predecessors. Since the association was first established in 1899, no one had held the chairman's post for more than four years. Gahr remained for eleven. And no one has equalled his tenure since. "He is one of the most important chairmen MVL has ever had, full of initiative, clear, courageous and authoritative", wrote Hans Lødrup about Gahr in MVL's fiftieth anniversary report. [195]

Gahr also held other positions. In 1944 he became a member of the board of IRAS [Industriforbundets rasjonaliseringskontor], the Rationalisation Office of the Industrial Association, and in 1949 chairman of the board. He retained this position until 1965. Gahr's position in IRAS was no accident; he was a prominent spokesman for the use of rationalisation in industry, and as we have seen, Kværner Stove Foundry itself was quite advanced in this area. Finally, we must mention that Gahr was deputy chairman of the board of Norsk Jernverk [Norwegian Iron Works] from 1946 to 1949. In 1953 Gahr was awarded the Order of St. Olav and named Knight of the First Class for his contribution to Norwegian industry.

Jøtul Ltd is liquidated

Due to the market situation in the 1920s, the sales corporation Jøtul Ltd did not come to play the role that was anticipated when the company was formed in 1920. Indeed, the plans for distribution of production had been implemented to some degree. And the corporation made use of a good deal of shared advertising throughout the early part of the 1920s. However, the weak market gradually corroded the foundation for production distribution. In addition, heightened competition in the field caused the foundries in the coalition to find it more advantageous to present an independent image. This also applied to Kværner Stove Foundry, which at the beginning of the 1920s invested more efforts in its own advertising than in shared advertising.

As we have seen, it was Kværner Stove Foundry that was the largest member of the coalition. In the early 1920s the company was responsible for about 60 per cent of the turnover in Jøtul Ltd. Such a position led the company to influence circumstances to its own advantage. There is little doubt that

Jøtul Ltd primarily became a tool for attending to Kværner Stove Foundry's interests. Indeed it was Kværner that brought the majority of the income into the corporation, but this was largely outweighed by the fact that Jøtul Ltd took on a number of tasks that were solely concerned with Kværner Stove Foundry. Moreover, it seems as though the position was used to some extent to secure turnover for Kværner Stove Foundry at the expense of other members. For example, in 1925 Jøtul's management decided to cease operations at Kråkerøy in order to improve turnover at Kværner Stove Foundry. As the minutes of the board meeting stated: "Kraakerøy has little to do, and since employment at Kværner is also declining, it was found appropriate to shut down operations." [196]

Kråkerøy was also the foundry in Jøtul Ltd that was hardest hit by the recession. As early as 1922 the plant was shut down for the first time. Over the next few years a number of operational shutdowns followed. Indications are that the connection to Jøtul and Kværner Stove Foundry was the main reason for the problems. [197] To some extent this may be true. However, there were probably other conditions that were more important. The problems were due primarily to the fact that the company was operating under very difficult market conditions. The market for hygienic fixtures, which was Kråkerøy's main product line, was dominated to a much greater extent than the stove market by cheap imported products with which it was difficult for a Norwegian foundry to compete. [198] In addition, Kråkerøy was established in the middle of the expensive period and for this reason had high debt. The company stopped production for the first time in 1922, and in the coming years operation was very uneven. In 1929 Kråkerøy was declared bankrupt. The company was later sold, and after that time had no connection with Jøtul Ltd.

But things were not going well with the other foundries either. For example, Aadal Works was hit early on by some of the same problems that Kværner Stove Foundry eventually experienced, namely the breakdown of their banking relationship. Aadal's bank, Oplandske Kreditbank, was put under official administration as early as 1923. This put the company in a difficult financial situation. Aadal was also affected by the lack of demand, and its operation was quite uneven for long periods, even though the problems were not as great as Kråkerøy's. Aadal's fate was sealed, however, in 1928, when the entire company burned to the ground. The times permitted no rebuilding, and the fire thus marked the end of a company almost 100 years old.

Finally, Hamar Iron Foundry fell out of the coalition in 1930. Hamar had not been included in Jøtul Ltd from the beginning, as we learned, but it later became tied to the corporation through a separate agreement in 1921. Hamar's production was rather limited through the entire decade of the 1920s, however, and here too there were big problems with turnover and profitability. The operation was provisionally liquidated at the end of 1927. Later it was restarted again, but liquidated once again in 1930, and this time for good. [199]

The basis for Jøtul Ltd's existence gradually crumbled as the member companies dropped out. By 1930 only Kværner Stove Foundry was left, and the company's resources were then transferred over. After 1930 the corporation had no employees. In fact, the shares were devalued almost to zero by this point. As we have seen, the value had once been 5 million kroner at the time of establishment. But as early as 1922 it had been devalued to 1,225,000 kroner. In 1929 the share capital was again devalued, this time to 50,000 kroner. And after that there was no more activity in the corporation. But the

decision to liquidate operations was not made until 1935, and it was another three years before this formally occurred.

However, the name of the corporation lived on. In the 1920s Kværner Stove Foundry's products had been marketed both under their own name and under the Jøtul label. And as a result of the rather comprehensive advertising operation that Jøtul Ltd had carried out during this period, the corporate name had become ingrained in the market. Kværner Stove Foundry had even launched several models under the Jøtul name. It was therefore decided to keep the Jøtul name – both as a company name and a trademark. In 1935 Kværner Stove Foundry changed its name to Jøtul and Kværner Stove Foundry. From that time several of the new models were launched under the Jøtul brand. And in 1953 the Kværner name was removed, and the company name changed to Jøtul Ltd.

One of Jøtul's great classics. Wood stove 602 was designed by the architects Blakstad and Munthe-Kaas and decorated by the sculptor Ørnulf Bast. The model went into production in 1940. It was designed according to a new principle with front combustion, which made the fuel burn much better – a big advantage as the war was looming and the shortage of fuel was critical. This stove is still being made today!

World War

On September 1, 1939, world war broke out in Europe. As it had during the First World War, Norway declared itself neutral in the conflict. This time, however, the country was drawn into the war in an entirely different way. In the spring of 1940 Norway was occupied by German troops, and for the rest of the war the Germans controlled the country.

As during the previous war, there were shortages of a number of imported goods, including coal and coke. The shortages began to make themselves felt even before the occupation, and in the autumn of 1939 the price of coal and coke began to rise noticeably. In addition, coal and coke were subjected to official regulation at an early stage. As early as February 1940 the authorities introduced prohibitions against the use of coal and coke for heating. With the onset of the occupation the restrictions were tightened even further. On April 10, 1940, the day after the Germans invaded the country, the national fuel board announced that coal and coke would be reserved for strategically important industry and other "operations absolutely necessary to society". In February of 1941 the last measure was instituted in the fuel regulations when Forsyningsdepartementet [the Provisions Department] initiated full coal and coke rationing. [200]

Next to electricity, wood became the most important energy source during the war years. There were rich resources to be had in the interior of the country, even though wood prices rose significantly as a result of the increased demand. However, many people could not switch over directly to wood burning. Particularly in the cities, people often relied exclusively on coal or coke, which meant that they did not have stoves that were adapted to wood burning. The coke stoves had much smaller burning chambers than the wood stoves, and they could not be adequately stoked with wood.

The same applies for 118 as for 602, but 118 takes logs of 60 cm.

The transition to wood burning therefore brought with it a conversion of the heating sources. While coke stoves dominated the production of most stove foundries up to the outbreak of the world war, wood stoves took over during the course of the war as the most important product. In thousands of residences and other buildings, coke stoves were replaced with wood stoves during the war years. In addition, the huge demand for wood stoves was related to the German initiative to construct barracks all over the country. So the war was a golden period for the stove industry.

Nr. 118 for hel favnved.
Nr. 116 for halv favnved.

«Småfuglen flyg mot Rute, og vilde gjerne inn . . .»

Garborg kunde få frem forskjellen mellem norsk vinter og ovnskrokhygge.

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Også over Jøtul-ovnen er det noe så velsignet norsk. Når den varm og god holder vinterkulden ute gir den en egen primitiv trygghetsfølelse.

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Derfor er Jøtul-ovnen ikke «bare en ovn» men den blir som et levende vesen som man koser sig sammen med.

JØTUL OG KVÆRNER OVNSTØPERI A/S
OSLO

Forhandlere i alle byer og landdistrikter eller skriv til fabrikken, postboks 318, Oslo.

Jøtul noticed an increased demand for wood stoves early in the autumn of 1939. Into 1940 the demand went through the roof. After the occupation began it increased even more, primarily as a result of the Germans' requirements. Early in 1941, for instance, Jøtul received an order for 6,000 stoves for the German Luftwaffe in Norway. [201]

In the summer of 1940 Jøtul had to operate two shifts to handle the demand for wood stoves. [202] And production continued at this rate through the entire first part of the war. From October 1940 to October 1942 alone, Jøtul sold over 25,000 units of models 116 and 118. [203] And in 1942 a new, smaller wood stove, number 601, was put into production, which sold in large quantities. Many went to the German barracks, and in 1941, for instance, Jøtul received an order for 6,000 stoves for the German Luftwaffe in Norway. But most went to households as replacements for coke stoves. Production did not decline until towards the end of the war, as a result of lack of materials and rationing. But it seems that the stove industry also received significant allotments in this period as well, presumably because the Germans considered it strategically important. [204] First of all, they themselves were completely dependent on the industry. Second, it was of great importance to society to keep stove production up so that the population could switch over to wood burning without too much difficulty.

Model 118 became one of Jøtul's best-sellers during the war.

Economically the war years were marked by strong growth and good profits for Jøtul. In the last years before the war the annual turnover was a bit under 2 million kroner. In 1940 it climbed sharply to 3.2 million kroner, and in 1941 to all of 5.1 million kroner. After that it dropped slightly, but never to pre-war levels. In 1942, 1943 and 1944 turnover was 4.7 million, 3.6 million and 2.7 million kroner, respectively.

There was no reason to complain about the bottom line either. Good profits made it possible for the owners to take considerable dividends during the entire war. The exception was 1944, when shortages of both pig iron and cinder led to a sharp reduction in production and temporary full shutdowns. Jøtul was thus able to build a very strong financial base during the war years. Large parts of the profits were used for paying down debt, and by 1945 the company was almost debt-free. This was considered a great strength as Norway moved into the post-war era. Many were predicting a post-war depression of the type experienced after the First World War, and with low debt one would be better prepared to handle such a situation.

Reality, however, turned out to be rather different. After the war the Norwegian economy moved into the longest continuous period of growth in modern times. The stove industry, as well, experienced good times for many years. But the post-war period also heralded great changes in the heating market. In the 1950s new energy sources and heating solutions began to have greater importance at the expense of traditional hearths. And by 1960 it was obvious that electricity and liquid fuels would be the heating sources of the future. How Jøtul met these challenges we shall see in the next chapter.

In its advertising during the Second World War, Jøtul used nationalism as one method of emphasising warmth and security.