

RAUTE

114 years of work
wrought in iron



Sane Keskiaho

RAUTE

“Buildings, machines and products
only form the inanimate environment
to which the people working with
them give life.”

**CEO AARNE MUSTAKALLIO IN HIS SPEECH ON
THE 40TH ANNIVERSARY OF RAUTE IN 1948**

© Sane Keskiaho

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FOREWORD

I remember Raute’s history well, ever since its first days 114 years ago. Well, at least I have accumulated memories of quite a few events and stories spanning the company’s lengthy history. The recollections feel genuinely mine, although in all truth, I have been able to observe only around half of them in the making myself. The rest I have heard from on multiple occasions from people who actually saw and experienced the events themselves. From close family or friends whom I know or knew very well. And technically even this is not wholly accurate, given that my grandfather was born in 1907, and Raute was established in 1908. This means even he could remember the early years of the company only by gathering recollections of the company’s affairs and times through events recounted to him.

The stories and memories of the company’s 114-year journey collected over four generations have also become part of my memories and formed into personal experiences. Some of these recollections have also already been passed on to a fifth generation. This is how our family memory accumulates and passes through and with us toward the future, becoming part of the memory of future generations. There is indeed something special—timeless and deeply personal—in a family business.

The family memory is inseparable from the company’s memory. And the company’s memory can be viewed from a number of different aspects. Individual events, with their precise facts on important transactions or turning points, make up the backbone of a company’s identity. The events and transactions have been written down as histories, reviews, individual letters and archived documents. Personal memories support recorded history, make it vivid, bring it to life. It would be a mistake to write off personal recollections as silly

or skewed, because surprisingly often such recollections—even the implausible ones—match the recorded and preserved facts.

When we combine personal recollections with not only recorded history but the recollections of the company’s former and current key personnel, we come to appreciate the contemporary company as an integrated international and multinational whole with a common Raute identity. Over the course of time, ways of working and practices deemed good have become principles and values. These principles and values form today’s Raute identity.

For this book, Sane conducted interviews and delved into vast archival sources to collect yet new and accurate bits and pieces of memory about Raute’s history. This book is a fine example of how, even after 114 years, recollections, archival sources and the valuable interviews of employees match our “own” recollection, the one with which all of us at Raute are so familiar.

Thank you, Sane! I also want to thank Eija for all the great findings yielded by the archives and image banks!

All of us at Raute should make an effort to ensure that all these recollections of our history and the company’s collective memory are retained. The identity shaped by tacit knowledge guides us to do what is right and prepares us for the task of passing on our memory.

This book is a wonderful and expansive piece of work that will serve the memory of us all. Thank you.

Helsinki, August 18, 2022

Mika Mustakallio

Vice Chairman of the Board

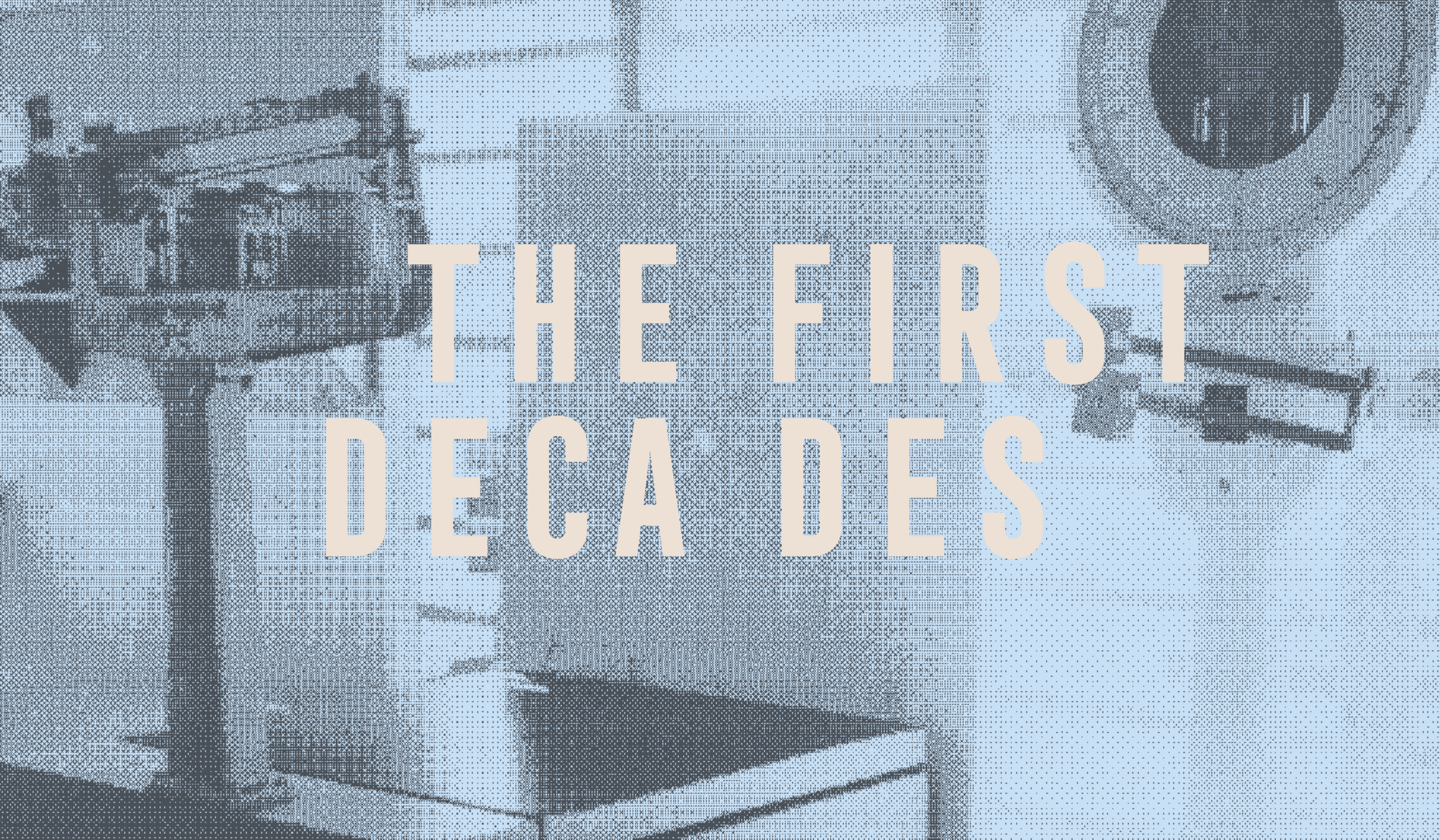
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“The work in our factory goes on day and night, on workdays and Sundays alike,” wrote Henrik Schwartzberg, naval architect and director of Lahden Rautateollisuus, to his father, Provost Johannes Schwartzberg, in January 1914. Schwartzberg had taken over as the technical director of Lahden Rautateollisuus three years earlier, when the nearly bankrupt business had been repossessed by Kansallis-Osake-Pankki. Schwartzberg and Edvin Kauppinen, who had taken over as the company’s governor, or managing director, around the same time,

managed to turn the tide for the company. The unprofitable shipbuilding business was closed down, and the technical expertise was put to work in the development of sawmill machines. Today, Raute machines are used for the production of plywood on nearly every continent of the world. Originally developed for Finnish wood, the machines have been adapted for numerous tree species—some of which are quite exotic from the Finnish perspective—as the company has captured new markets in countries near and far.

The background is a halftone (dotted) image of a city street scene. On the left, a car is parked or moving along the street. In the center, a person is walking. On the right, a large, dark, circular object, possibly a clock or a large wheel, is visible. The overall tone is monochromatic with a textured, dotted appearance.

THE FIRST DECADES

1908 Lahden Rauta- ja Metalliteollisuustehdas Osakeyhtiö's articles of incorporation are adopted on February 29, 1908.

1911 Henrik Schwartzberg is hired as technical director and the company's name changes to Lahden Rautateollisuus Oy.

1913 Edvin Kauppinen, hired a year earlier, takes over as governor and the manufacturing of iron beds is discontinued.

1913 The export of wood processing machinery to Russia begins.

IN THE EARLY 1920S, Finland's economy rebounds to the pre-World War I level. Global demand for Finnish sawn wood is at a record high and sawmill machines are needed. The sawmill machines of Rautateollisuus are in high demand again.

1928 Henrik Schwartzberg is appointed the company's president.

1929 The Stock Market Crash in New York and the global recession plunge the Finnish sawmill industry, and thereby Lahden Rautateollisuus, into difficulties. Sawmilling in Finland declines by 50 percent.

The inventory purchases of the central cooperative society Hankkija help the company survive the slump.

1933 Production in Finland and Rautateollisuus is growing again. Henrik Schwartzberg launches the development of plywood

1931 The first veneer lathe stands in the factory's yard.

1938 Henrik Schwartzberg retires, and is succeeded at the head of the company by his sons, Aarne Mustakallio as the managing director and Pauli Mustakallio as the technical director.

1908 — 1920 — 1938

The production of inland vessels is discontinued, and replaced by sawmill and woodworking industry machines, gang saws, band saws and planers.

1914 The production of scales begins.

1914 Munition deliveries to Russia begin as World War I breaks out.

1917 Exports to Russia grind to a halt as the Russian Revolution begins.

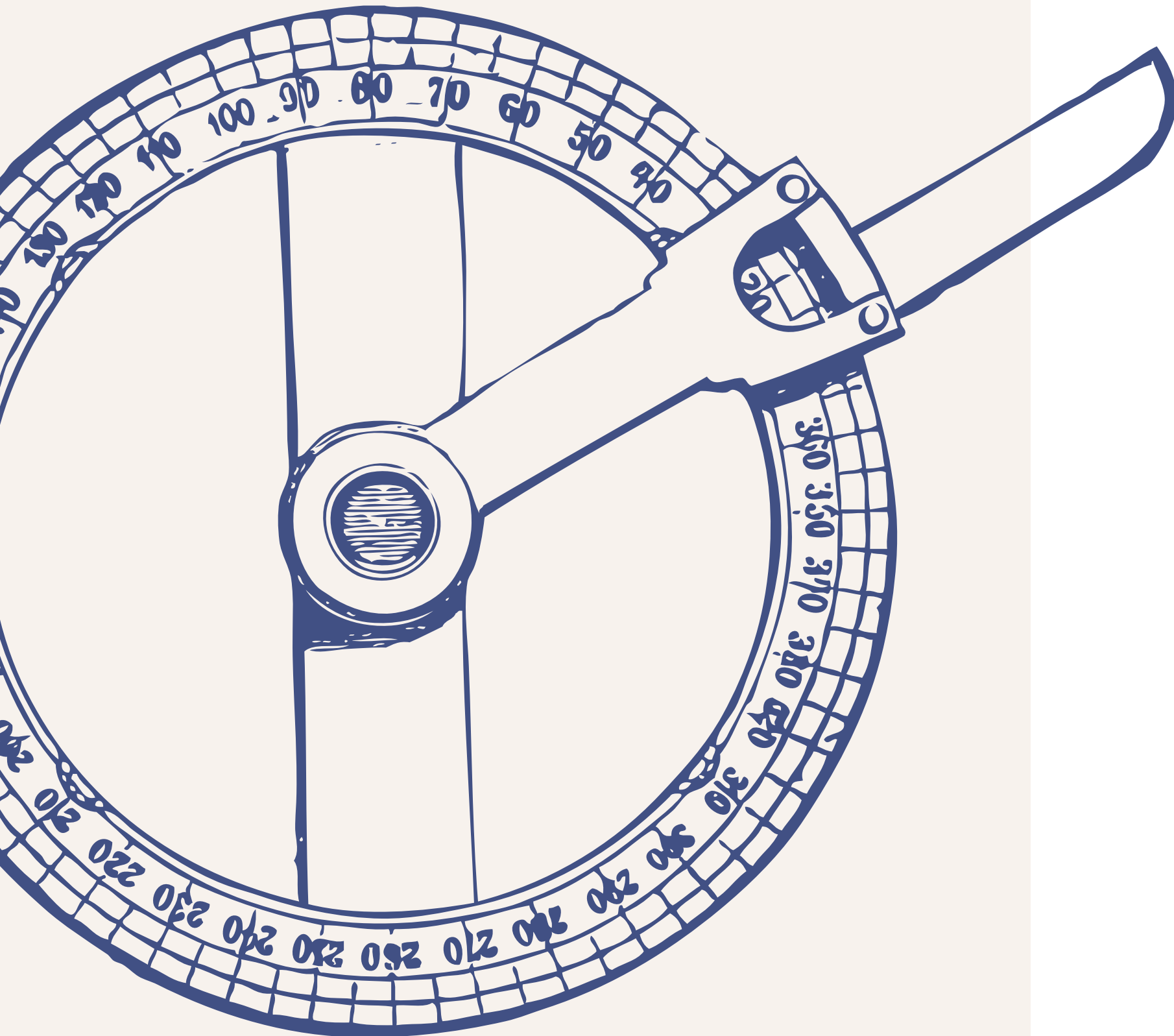
1918 Employees who fought on the side of the Reds in the Finnish Civil War are brought back to work.

AT THE BEGINNING OF THE 1920S, Rautateollisuus is by far the biggest company in Lahti, with a personnel of around 200. The decade proves to be one of steady development and growth for the company, with the exception of 1924–25, which are marked by a severe economic downturn.

The company's key products consist of gang saws, edgers and planers. Sawmill and woodworking products account for more than half of the production.

AT THE BEGINNING OF THE 1930S, many sawmill and woodworking plants are at a standstill. The sales of Rautateollisuus drop by a third, and the number of employees must also be downsized by one third. The depression proves a beneficial period for product development, and the company develops machinery for the production of plywood.

industry machines in cooperation with the Finnish plywood trade. Until this point, the industry has had to purchase their machines from abroad.



“REPAIRS OF ALL KINDS”

Nowadays, Raute Corporation is one of the world’s leading suppliers of plywood machines and equipment as well as entire factories. The company has had a profound impact on the entire industry’s development, but its roots go much deeper than plain plywood. Indeed, it did not manufacture its first veneer lathe until 1931. Before that, it made inland vessels, iron-wrought beds, band saws, saw arms, scales and other machine shop industry products.

The company saw its beginnings in 1906 when industrialist P. Kuivalainen and Misters S. Huotari and K. A. Kylänen set up a machine shop for “*repairs of all kinds*” in the vacated buildings of a “splint factory” in Lahti which had made splints for matchsticks. A couple of years later, the form of the company was changed to a limited liability company, and the Kuivalainen factory was named Lahden Rauta- ja Metalliteollisuustehdas Osakeyhtiö. The new articles of incorporation were adopted on a Leap Day, February 29, 1908, and entered in the trade register on April 30, 1908. The equity amounted to 250,000 Finnish markka (FIM), which was a fairly substantial amount of money at the time.

The company bought the buildings located at Vesijärvenkatu 23, Lahti, from P. Kuivalainen. A few “*necessary and modern machines*” were purchased for the new factory, and four melting furnaces were installed on the factory floor.

“There were quite a few hurdles to overcome at first, when the formation of Lahden Rauta- ja Metalliteollisuutehdas into a limited liability company began in early 1908. Tangled ownership affairs between the factory’s actual owner, A.B.H. Renlund O/Y, and its

governor, Mr. P. Kuivalainen, resulted in many negotiations and slowed down the establishment of the limited liability company,” noted the first annual report.

Several Lahti-based businessmen in addition to Kuivalainen were involved in the new company, whose first managing director was J. Hamberg.

According to a survey conducted for Suomen Konepajat, the company employed one woman and 75 men in 1909. The working hours began at 7 a.m. and ended at 6 p.m., with an hour’s rest during the day.

FIVE UNPROFITABLE STEAMERS

The first decades of the 20th century were the golden area of inland waterway transportation. Finland’s nearly 200,000 lakes form long and rambling waterways which were used to transport freight and animals from one town and location to the next. Cruising came into vogue in the early 1900s. Spurred by this trend, Lahden Rauta- ja Metalliteollisuustehdas Osakeyhtiö began to build boats and the steam engines and boilers used to power such boats. The factory made contracts on the building of steamers named Kaila, Aallotar and Päijänne, and later Vehoniemi. The fifth and final vessel was delivered to station master Södeström.

Besides steamers, the company made three large horizontal steam engines. One of these was delivered to Lahden Polttimo, another to the shores of Lake Ladoga, while the third remained in the company’s own factory.

Although the vessels were technically successful, the financial results they generated remained meager, given that the vessels’ machines and iron materials had to be assembled twice. First, they were made and assembled in the factory’s machine shop, located on the outskirts of the town center, by joining various parts. They were then transported by rail down to the docks, where they were reassembled and riveted together.

The repeated work phases and subcontracting used for the vessels’ interiors strangled the already cheaply sold vessels’ margins to a minimum. For example, the sum of the joint contract for the Aallotar and Päijänne vessels was a mere FIM 19,000, which in today’s money would be equivalent to slightly more than EUR 81,000.

The financial difficulties were to blame for the company’s management changing several times over its first three years, which did very little to improve matters. By the second year of operations, Hamberg and Kuivalainen had already resigned. They were replaced by Pertti Rautio as managing director and engineer Eetu Niemi as governor. The very next year, engineer Ilmari Mellin was hired to take over as governor and technical director.

Finally, the financial difficulties exacerbated to a point where the company threatened to go under altogether. The financial statements in 1910 showed a loss equivalent to nearly the entire share capital. Kansallis-Osake-Pankki, the bank which had been financing Lahden Rauta- ja Metalliteollisuustehdas Osakeyhtiö, repossessed it at the beginning of the following year. The bank’s first step was to fire the company’s top management and hire naval engineer Henrik Schwartzberg, who had earned his spurs at New York Shipbuilding Co. in the United States and Hietalahden laivatelakka ja konepaja Oy in Helsinki, as its technical director. The Iisalmi-based Edvin Kauppinen was appointed managing director a couple of years later.

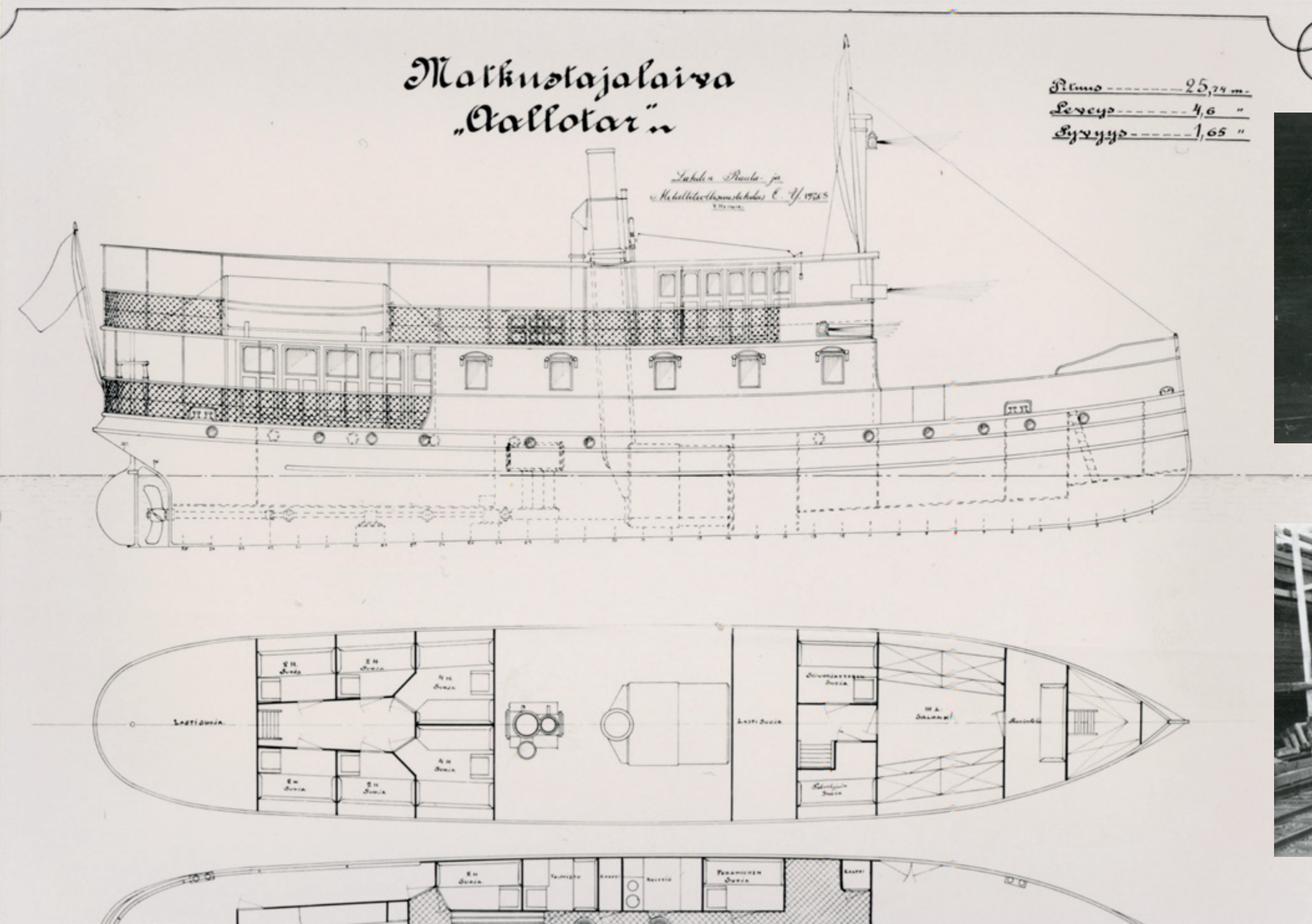
With the help of a loan granted by Kansalais-Osake-Pankki, both men acquired a considerable number of shares in the company, which had shortened its name to Lahden Rautateollisuus Oy. This was a sign of faith and commitment in the company, even though its outlook was weak. Over time, the controlling interest transferred to Schwartzberg and his family.

The men turned out to be a good team. Kauppinen took care of the numbers, and while he “*managed and was responsible for the company’s affairs,*” naval engineer Schwartzberg had a knack for sales and technical matters. Together they managed to get the business back into the black.

BOLD MOVES

But the company’s direction was not changed overnight, and it required some bold decisions and risk taking.

Having studied shipbuilding, Henrik Schwartzberg’s first move was to discontinue the manufacturing of the unprofitable iron-hulled steamers. Improved road connections were shifting travel from steamers to buses, and the popularity of inland waterway transportation was waning. Schwartzberg could see there was no



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future for shipbuilding. He also split the factory into two departments, both with their own accounting and master workmen.

Department 1 was a machine shop, complete with a foundry and sheet metal shop. The department mainly produced machines needed by the mechanical wood processing industry and, in between, various manual pumps used in agriculture. Pumps of this kind had not previously been manufactured in Finland, and the markets had been wholly reliant on imports. The Lahden Rautateollisuus pumps which made the best name for themselves over the years were called Niagara and Kolonial.

Department 2 was a special-purpose factory, which initially focused on iron beds and subsequently on decimal balances.

WOODEN BEDS ARE NO MATCH FOR IRON ONES

The iron beds were manufactured for some five years. For the duration of these years, the iron beds of Department 2 were a bestseller. Then the fashion changed, and the heavy iron beds were replaced by lighter, wooden ones.

In an ad published in the *Käsityö- ja Teollisuuslehti* magazine, Lahden Rautateollisuus claimed to be Finland's biggest iron bed factory. This was probably an exaggeration, given that the factory had several significant contemporaries in Helsinki, including Suomen Rautasänky and Suomalainen Rautasänkytehdas. Whatever the truth, Lahden Rautateollisuus did at least offer a considerable range of iron beds, and one which also represented the top of the line in its industry. The beds were famous for their quality *enameling* and special attention was paid to their decorations. In an old interview, Janne Pesonen, who joined the patternmaker's shop in the foundry in 1911, recalls collecting pine and spruce cones on Mattilanmäki at the beginning of his career. The cones were used as casting models for bed decorations. Pesonen's career in the patternmaker's shop lasted 53 years.

The bed parts were cast in the factory's own foundry. The frames were made of a heavy steel profile and the bed slats from steel band or woven mesh. In old print ads, the iron beds were praised as solid and reliable: "*Wooden beds are no match for iron ones*".

In a bid to distinguish its products from those of its competitors, the company organized a drawing competition for iron bed models, to complement its range with "*products that stand out from your run-of-the-mill goods*". Some renowned artists and architects of the time,

like teacher and painter Oskar Elenius, took part in the competition. The cover of the glossy art nouveau style brochure was probably designed by Henrik Schwartzberg’s sister Maria, also an artist.

The beds were sold primarily to domestic customers, although a Russian edition of the 1912 list of iron beds was published for the sales office in St. Petersburg. Large numbers of beds were indeed delivered to Russian troops stationed in Finland, but the bed market in Russia itself was difficult due to the country’s high import duties and the different bed models favored there.

A review of the Finnish industrial sector published in 1913 (Kotimaisen teollisuuden albumi) made the following remark about Lahden Rautateollisuus: *“The dire straits that gripped the industrial sector nationwide complicated and stalled the factory’s development during its early years, but lately the business has gained, through its lauded products, a noteworthy position as a skilled manufacturer of wood processing machines and iron beds of all kinds in particular”*.

But preferences changed in step with the world at large, and despite the company’s 169 skillfully made iron bed models, Finnish homes began to opt for lightweight wooden beds in increasing numbers. In 1913, the company discontinued the production of iron beds and for a brief period, produced folding wooden beds with a light *frame* instead. There is a nice anecdote about these folding beds as well. In 1926, Lahti hosted what were then called Rendezvous races, an event later (since 1937) officially referred to as the FIS Nordic World Ski Championships. The races attracted a record number of participants, which in itself was a great thing. The problem was how to find accommodation for all the athletes and invited guests. A solution presented itself in the form of a decision to hold the winter breaks of Lahti schools simultaneously with the event. This provided a chance for homestay accommodation to be arranged for the athletes and guests. The related problem of beds was taken care of by Lahden Rautateollisuus, which brought forward the production of its folding beds intended for the spring season and delivered 700 of them to the races’ organizers in Lahti for the duration of the races.

FROM BEDS TO SCALES

Once the production of beds had to come to an end, Department 2 specialized in the production of decimal balances and platform scales for households and stores. Henrik Schwartzberg led the development of these

products with an iron hand and, as old employees recalled, *“got the ball rolling on the scales thing and dictated everything”*.

The scales plant was located in the two-story building at the northern boundary of the factory grounds. The production represented cutting-edge technology and precision mechanics—a degree of accuracy that was unfamiliar to the workers. Master workmen and employees specializing in the production of scales were therefore trained for the purpose.

The first scales were brought to the market in 1914. They were well received and Lahden Rautateollisuus quickly came to dominate the Finnish market in this respect.

MANUFACTURE OF WOODWORKING MACHINES BEGINS

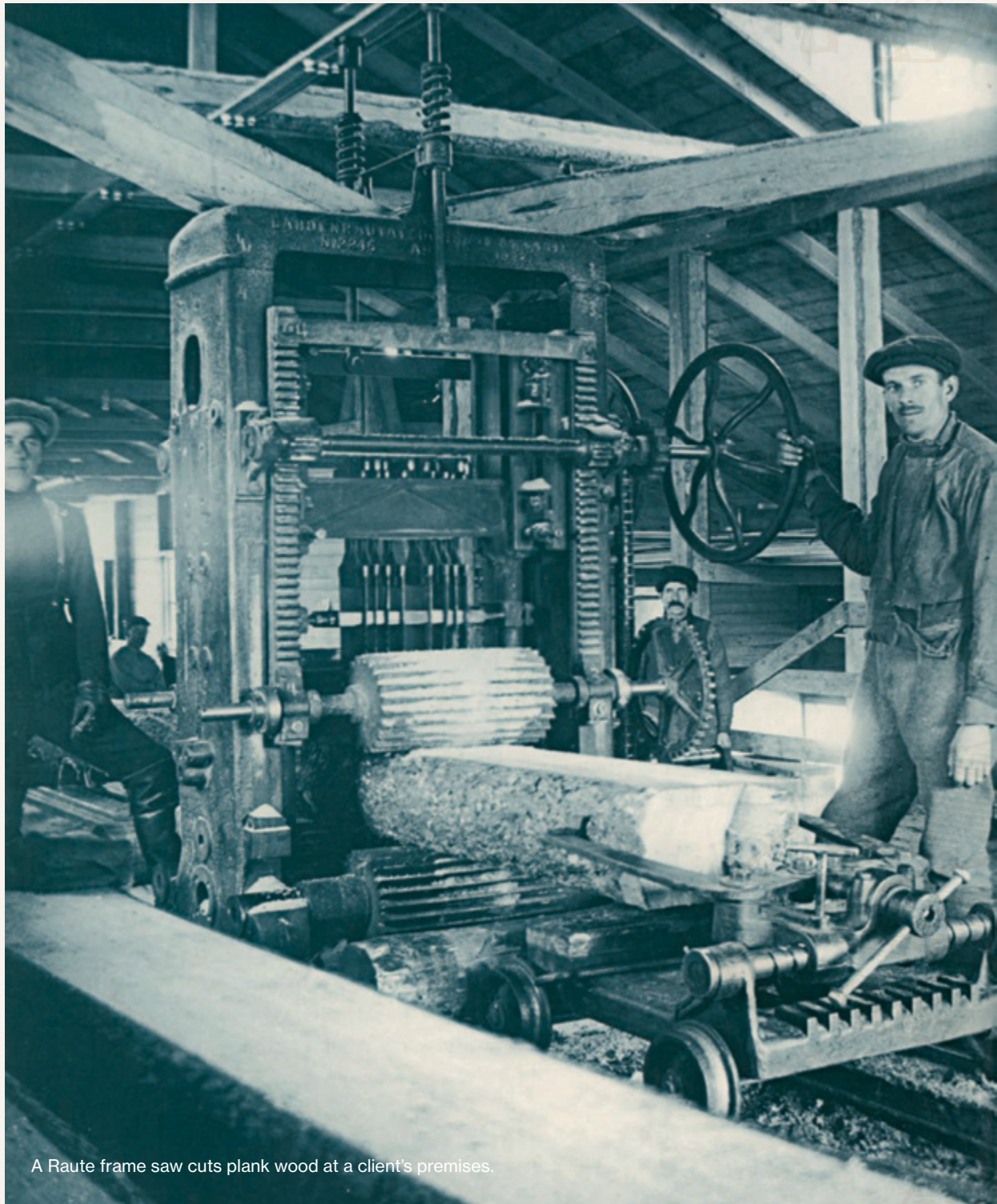
Meanwhile, Department 1, or the machine shop, had focused on developing and producing machines aimed at sawmills and the woodworking industry. For a company that made saw arms, this was the natural next step. It was also an indication of Henrik Schwartzberg’s remarkable prescience: In the 1910s, Finnish manufacturing covered only a few machines and pieces of equipment—nearly all the machinery and equipment needed in wood processing were imported. Schwartzberg began investigating what type of woodworking machines would be most suitable for Finnish tree species and therefore the needs of the country’s own wood industry.

Once this work was done and the machines had been introduced to the market, they quickly gained a good reputation. *“Lahden Rautateollisuus is the sole factory specializing in the finest wood processing machinery in our country, to which these machines have previously been imported,”* a trade magazine noted. The department’s main products came to be gang saws, band saws and planers. They received the top prize at every trade fair at which they were shown. Department 1 also continued to make agricultural pumps to maintain a steady production rate.

AN INDUSTRIAL LOT ON THE OUTSKIRTS OF THE TOWN

For a long time, Lahden Rautateollisuus was one of the biggest employers in Lahti, and the factory located on Vesijärvenkatu had great

The first scales were brought to the market in 1914. They were well received and Lahden Rautateollisuus quickly came to dominate the Finnish market in this respect.



A Raute frame saw cuts plank wood at a client's premises.

economic significance for the whole town. In 1913, the value of Lahti's entire industrial production was roughly FIM 8 million a year. Of this sum, the metal industry accounted for FIM 640,000 markka, of which Lahden Rautateollisuus Oy accounted for 80%, or around FIM 500,000. All this was achieved with a workforce consisting of more than 100 workers.

The industrial lot on the outskirts of Lahti was home to a wooden, gabled office building, painted gray, and the redbrick factory building, which housed the machine hall, power station, boiler room and workshop.

The workshop was equipped with a pair of furnaces, a large and small steam hammer, and several anvils and vats of different sizes for the tempering of steel. In the machine hall, the intermediate gear shafts' belt rollers, powered by a steam machine, pulled the lathes, drills, milling machines and planers in rows parallel to the shafts. A veritable jungle of belts dangled from the ceiling.

In the early years, the factory was heated with firewood, and the water it used was transported there from the Laune springs in barrels loaded on horse-drawn carts. In 1912, some of the facilities were fitted with plumbing.

This is how a newspaper article from 1913 describes the site: *"The factory's workshops are all new, filled with light and air, and of a first rate quality in all manner related to health. The factory employs its own doctor. The workforce's average earnings—4.50 a day—can be considered good in relation to conditions in the area. The work is usually carried out in a single shift"*.

There were also stables in the lot, with room for a couple of horses, as well as the horse-drawn vehicles and carriages. The company also employed a stable worker, who took care of the necessary transportations of people and goods to the railway station and elsewhere in town.

As technology improved, the machines became more efficient and the need for power increased. The 85-horsepower steam machine, which was built by the factory workers and had served them loyally and reliably, became too small and was disposed of in 1923, when the company was hooked up to the town's power grid.

In addition to domestic raw materials, the factory used foreign ones, imported to the factory by sea from the UK, Germany and Sweden, and by rail from Russia. To ease operations, a separate spur from the Loviisa-Vesijärvi railroad line to the factory area was built.

Markku Lindgren, who joined Raute as a fitter in 1969, recalls the railcars clanking along the tracks from the Lahti port to the factory yard.

To ease operations, a separate spur from the Loviisa-Vesijärvi railroad line to the factory area was built.

The packages awaiting loading stood in a row and were hoisted on board with the state-owned railway company VR’s crane. Once the loading was complete, the train, full of machinery, headed off for the Soviet Union.

Even when empty, the railcars were so heavy that getting them on the move was difficult in some weather, even with the aid of a tractor. It was therefore important to get the line of cars to stop at least roughly in the right location in the factory yard. This required three to four men to possess some skill, fast feet and a meter-length plank: The men either walked or jogged alongside the line of railcars, shoving the plank beneath the rolling road wheel. While the plank crushed under the car’s weight, it also slowed it down a little. The remaining piece of the plank was fed piece by piece beneath the wheels until the railcars stopped.

The railcars did occasionally “make a run for it”. This was usually the result of a forklift hitting a railcar during loading, causing the railcars to start sliding from the yard, across a busy road, towards the shore. Luckily, this never resulted in an accident, and the railcars were always stopped in the end.

EXPORTS TO RUSSIA

The Maamiehen Kalenteri handbook published by Weilin & Göös in 1913 reveals that at the time, Lahden Rautateollisuus was already exporting goods to Russia and had consignment stocks in Helsinki, St. Petersburg and Moscow.

Competition, especially in the field of sawmill and woodworking machines, was fierce, but Schwartzberg was a good tradesman, and often traveled to Russia himself to market the products. To increase exports to the eastern neighbor, the company had hired the commercial agent Börtzell to represent it in St. Petersburg. He was also a familiar guest in Lahti and the Schwartzberg household.

The start of World War I in 1914 interrupted exports to Russia for a while. The factory was shut down, but the employees were called back to work only a week later, given that men in Finland, which was autonomous, were not liable for military service, and could continue working normally. Lahden Rautateollisuus began manufacturing turning lathes for artillery shells, field kitchens and escort wagons for the Russian army. The factory also produced substantial numbers



The company’s premises and facilities in the 1930s. Some of the buildings on the side of Vesijärvenkatu still exist.

of turning lathes for shrapnel shells. Shrapnel shells were artillery munitions filled with bullets which ejected the bullets toward the target at the end of their trajectory.

On the sidelines, the factory made mills used for grinding grain. “*At this very moment, there are 106 wagons standing in the yard, ready to be shipped off for the needs of the artillery personnel,*”, Henrik Schwartzber wrote in a letter to his father, mother and *other people back home* in 1915.

In 1916, the factory shipped 324 turning lathes for shrapnel shells, and when 23 gang saws and 113 field kitchens are added to this, the achievement must be considered notable in the exceptional circumstances at the time. The factory operated throughout the year “*at full capacity, some departments round the clock, resting only from 6 p.m. on Saturdays to 7 a.m. on Sundays.*” “*Whatever it is that the future may hold in store for us is quite impossible to tell at this time. However, one thing is certain: Such years as 1916 has been for our business will belong to memories in the years to come,*” was how the 1916 annual report concluded.

The Russian market closed down completely as the Bolshevik revolution took hold in the autumn of 1917, at the same time as the new foundry of Lahden Rautateollisuus was finished. Good neighborly relations were retained despite the revolution. Thanks to them, sizeable markets in the Soviet Union opened to Lahden Rautateollisuus following World War II and the reparations.

EFFECTS OF THE CIVIL WAR

Finland’s Civil War, which broke out on Sunday, January 27, 1918, had a variety of effects on the company’s operations.

Things in Lahti, controlled by the Red Guard, were peaceful at first, and the town tried to go about its business as usual.

“This is a station of some sort for the Red Guard, due to which there are a great many people here at times, and fewer at others. Our factory has been in operation throughout. Some of the men, around one fourth of them, have been absent for the whole time. Food is getting scarce, because the Red Guard is gathering all the foodstuffs in the area, sometimes emptying a house of them altogether,” Schwartzberg wrote to his mother, Mrs. Johannes Schwartzberg.

When the Reds took possession of Kansallis-Osake-Pankki’s branch office in Lahti in the spring, the factory was no longer able to withdraw its payroll from the bank. A delegation composed of some senior employees was sent from the factory to Schwartzberg’s house in the center of town to ask about the wages. The payroll was received when Schwartzberg sent one of the factory’s office clerks, armed with a suitcase, to fetch the money from the bank’s head office in Helsinki.

On April 5, 1918, the general staff of the Lahti regiment ordered the machine shop and foundry of Lahden Rautateollisuus Oy to be mobilized for the Guard. In practice, the factory was able to achieve very little which would have aided the Reds’ war effort, given that the founder ordered to start up the foundry work was taken ill a couple of days later. The supply department of the Finnish People’s Delegation, for its part, had ordered the agricultural and wood processing machines in the workshop of Lahden Rautateollisuus to be relocated to St. Petersburg. The machinery, ironware, oil and bicycles were to be loaded as briskly as possible onto a train heading east. The operation was suspended when the Germans invaded Lahti.

When the fighting in Lahti ended, some of the Red prisoners were temporarily held in the recently completed and still unmachined foundry on the factory grounds. In his book *Henrik Schwartzberg ja Hanna Augusta o.s. Gummerus*, Eero Mustakallio, Henrik Schwartzberg’s son, describes how his father sent him, at the tender age of 11, to the Civil Guard with a letter requesting that the prisoners be removed from the factory grounds so that work there could be resumed. His request was granted.

The town of Lahti
was a stronghold
for the Reds
and many of the
employees backed
the Red Guard.

Before the work resumed, Schwartzberg and Kauppinen scoured the prison camps looking for factory employees. In an old interview, one of the prisoners, Janne Pesonen, who worked in the patternmaker’s shop, recalls how Schwartzberg handed him a sealed envelope before his trial, which Pesonen then passed on to the court officials at the trial. This is how the employees of Rautateollisuus at the prison camps were released on parole and were able to return to work.

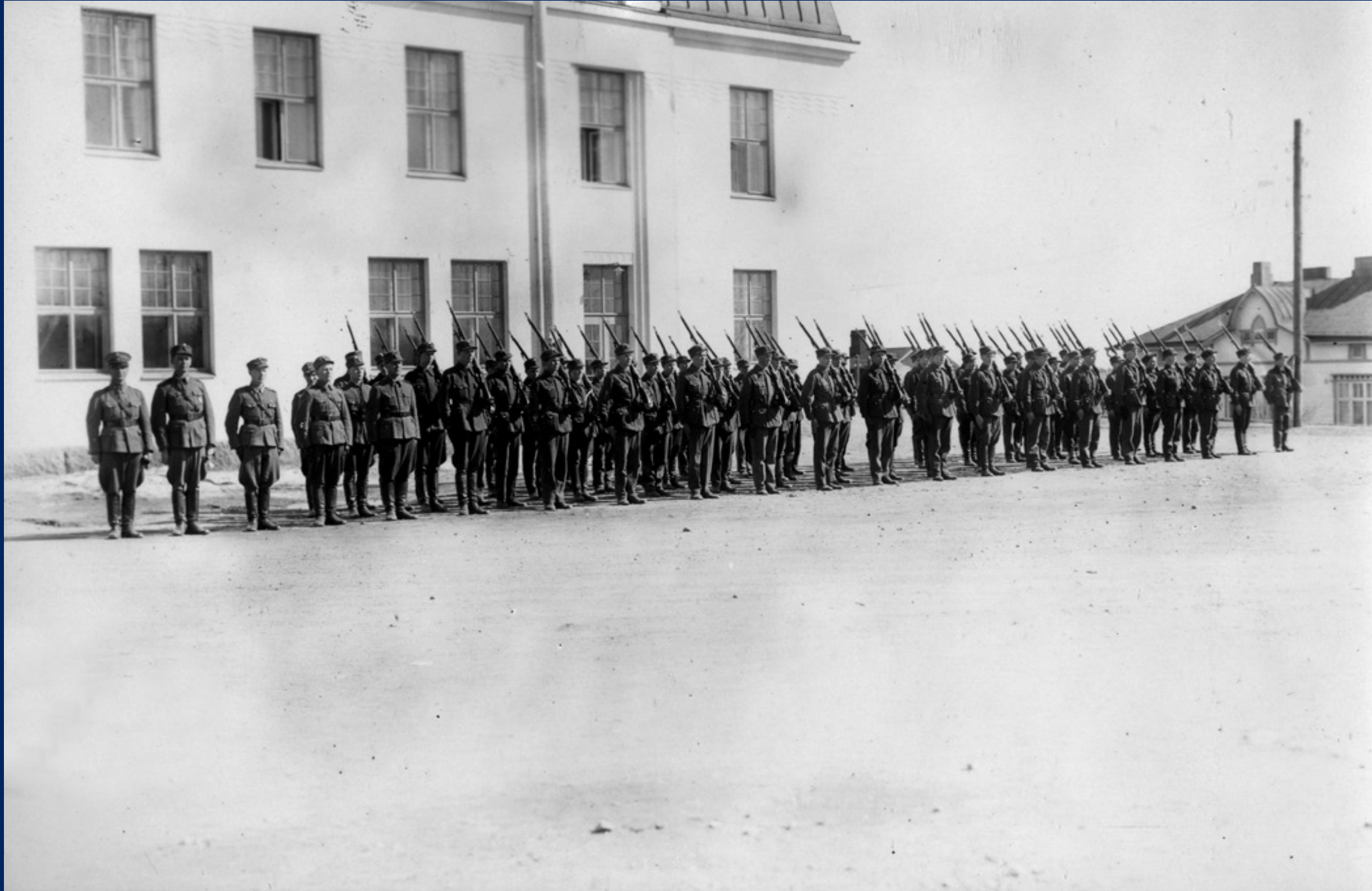
“The mood among our workforce has been peaceful following the period of civil war in 1918. No preparations at all for an insurrection have been observed among them. On the contrary, many factors have convinced us that the opinion prevailing among our employees is the one driven by the more serious, moderate elements within the socialist movement. It is precisely because of this that our business has been able to operate free of any disruptions in 1919,” the annual report stated.

After the Civil War, Lahden Rautateollisuus manufactured machines primarily for the domestic market. At the time, the central cooperative society Hankkija was Finland’s largest, and nearly only, retailer. With the help of Hankkija, the company sold what were referred to as subsistence mills, mainly used to grind feed grain for livestock, to farms in Finland.

The factory had enough work for more than the nearly 200 people working there at the end of 1919, but Lahti had a shortage of both skilled workforce and housing. *“The construction of new housing for the workers seems to be the only means by which to do away with our employees’ housing shortage and expand our production at this time,”* say the minutes of a Board meeting held that year. The problem was that the housing units would have had to be built with borrowed money, which was a *“decisive step”* the company’s Board of Directors was not yet willing to take. It was nevertheless an issue which the company would return to subsequently.

ECONOMIC DEPRESSION

1920 was a good year for Finland’s industrial sector. Until the end of October, demand was *“most robust”*. In the early 1920s, the country’s economy did indeed rebound to the level preceding World War I. Employing 201 people, Lahden Rautateollisuus was the largest company in Lahti and alone accounted for almost the entire region’s



The Civil Guard was a voluntary civil defense organization which operated in Finland between 1918 and 1944. It had 150,000 members and at its height, 672 local chapters. The Civil Guard was disbanded in November 1944, in accordance with the terms of the Moscow Armistice.

Members of the Civil Guard in front of the organization's building (on Harjukatu, opposite the town hall) on the first day of the Winter War, November 30, 1939.

Net sales for the year in question (FIM 6,617,645) were higher than ever. The future looked bright, and the company expanded the factory grounds by buying two adjacent lots.

metal industry. The world was being rebuilt after the devastation of World War I, and demand for sawn wood was at a record high. This also spurred demand for sawmill machines. According to the 1920 annual report, *“Demand for wood industry machines and mill machines was so high last year that despite our best efforts, our stocks were all but empty by the end of the year”*. Net sales for the year in question (FIM 6,617,645) were higher than ever. The future looked bright, and the company expanded the factory grounds by buying two adjacent lots.

In 1924, a new machine warehouse was built on these lots. At the same time, work at the factory reduced significantly. Products were manufactured for stock, and for a while, the machine department and foundry shifted from a six-day to a five-day workweek. The five-day workweek did not become a standard in Finland until the late 1960s. The demand for sawmill machines picked up again at the end of 1925, when the company was able to sell almost all of the stockpiled sawmill machines.

In 1927, Finland experienced one of the longest periods of industrial action ever, when 9,000 metal industry workers were compelled to undertake a seven-month lockout. The lockout concerned more than 60 metal works, one of which was Rautateollisuus. *“The course of the industrial action is probably so familiar from newspapers that there is no need to go into it. It may nevertheless be worth noting that the terms of the agreement reached through the mediation of Minister of Social Affairs Helo on December 20, 1927, insofar as they apply to our business, include raising the average hourly wages after the lockout so that they would be approximately 10% higher than they were in our company at the time when Ab Vulcan-Crichton Oy’s strike began. In other words, supervisors were left with the right to give bigger raises to good workers than to poor ones, a right which employers have steadfastly held onto ever since,”* said the annual report on the issue.

Before the *“industrial strife”*, Lahden Rautateollisuus employed 168 workers. Of this number, 159 went on strike. During the strike, the factory hired 100 new workers, and after the strike, 88 of the strikers returned to the factory. When the strike ended, the factory employed 134 workers.

The construction site of the longwave transmitter towers being built in Lahti saved many of the strikers from further trouble.

A NARROW ESCAPE FROM EXECUTION

“SOME THREE WEEKS BEFORE LAHTI WAS OCCUPIED, the Reds took over our factory, after we had emphatically refused to do any work for the Red Guard. From overhead telephone conversations I also understood that my own position was growing precarious, so I got myself admitted to the Lahti sanitarium. While I was there, I had my hernia operated on. The operation was successful, thanks to which I no longer need to wear a hernia belt. Only later did I realize how necessary this hiding in the sanitarium had been. This is because the Reds, during the occupation, looked for individuals whom they thought had money, and then robbed them. From our neighbors they took 45,000, for example, after which they went to our house and looked for the man of the house from the attic to the basement, including the wardrobes and all the other hiding places. No one else was at home at the time except two of the maids. Hanna and the children were in the very house that got robbed, and you could call them eyewitnesses to the event. Although their lives were threatened several times, they remain unharmed. I wonder what would have happened to me if I had been home, because I had no money on hand apart from a few hundred marks, and it was only money that would have saved a life in this case.” This is how Henrik Schwartzberg described the atmosphere in Lahti during the Civil War, in a letter he sent to his mother, Mrs. Johannes Schwartzberg, in 1918. During the Civil War, Henrik Schwartzberg lived in the

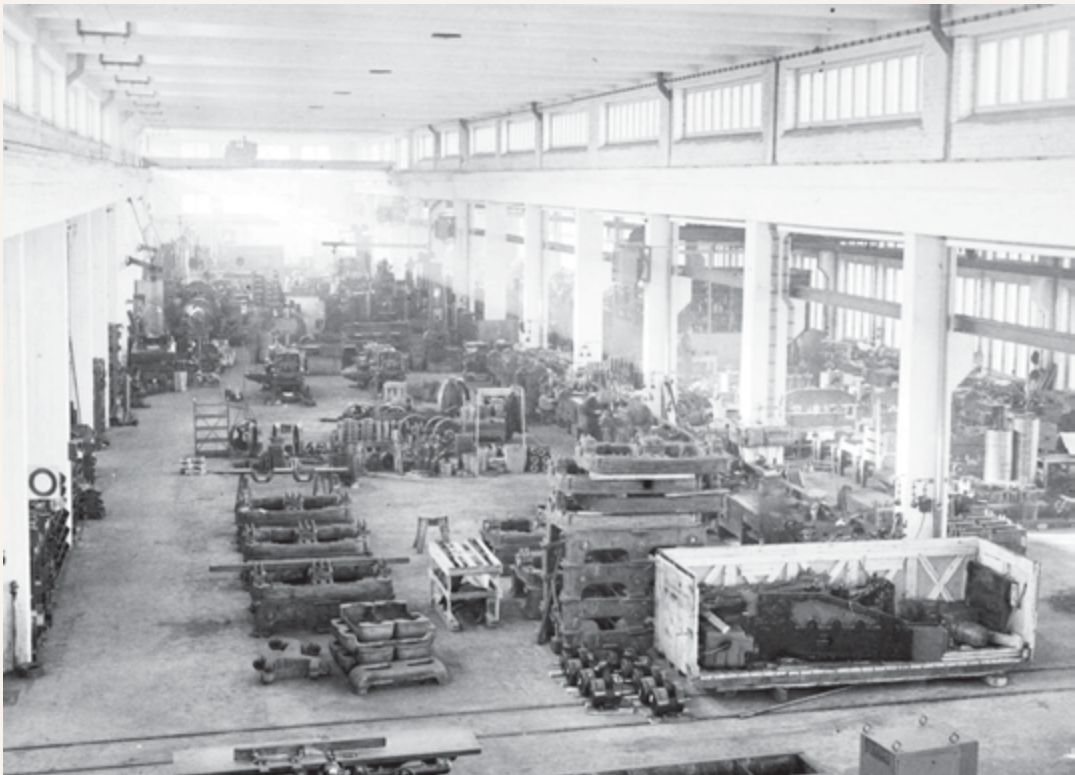
Frostell building in the center of Lahti with his wife, Hanna, and their six children.

In the same letter, he describes how artillery and shrapnel shells dropped almost like rain on the town, and rifle bullets whizzed by on the streets. This hellish life lasted for roughly two weeks. The factory director hoped the house would remain intact amid the shelling, “but how could the Reds have left the town’s biggest employer unharmed? That’s why they positioned one of the guns so that they could shell our house with it directly from the east, which left the gable of our house exposed. When the clock then struck eight in the evening, a shrapnel shell swooshed through the attic, destroying everything in its path”.

Schwartzberg ordered his family to the laundry room in the basement, which had a vaulted ceiling. The family had just entered it when three other shrapnel shells exploded with disastrous consequences, leaving the house on fire. The house burned to the ground during the fighting following the occupation of Lahti on the last day of April 1918. Schwartzberg and his family managed to get next door and to safety.

The story goes that Henrik Schwartzberg’s name was the first on the list of 700 people the Reds were planning to execute in the market square of Lahti on Saturday, before the Germans took over the town on Friday evening.

After the war ended, Henrik Schwartzberg was awarded the Civil War commemorative medal.



A view of the factory.

Under the lead of German contractor Lehmann & Co., two 150-meter towers were erected in the town in the fall of 1927, in just 74 days. Only Finnish men signed up for work at the construction site, some of them from the machine shop of Lahden Rautateollisuus.

Three years later, in 1930, Finland was hit by a severe economic depression. The Stock Market Crash in New York the year before and the resulting global recession did not leave Finland untouched. Due to its industrial structure focusing on the domestic market, the recession hit Lahti even harder than the rest of the country. While demand for plywood remained reasonable for the first half of 1929, it began to decline rapidly after that, gradually dwindling up to the point where hardly any timber at all was sold abroad. Sawmilling declined by 50%, and both the sawmills and woodworking plants went out of business. The annual sales of Lahden Rautateollisuus, which had amounted to FIM 8.7 million as recently as 1928, fell to less than FIM 3 million.

“Particularly the second half of 1930 was one of the slowest periods ever in our factory’s operations. The depression in our

The decline in production was a trial, because interest payments and amortizations could not be reduced in the same manner as the costs of labor and raw materials.

country’s timber markets which began the previous year continued and grew even worse. Consequently, sawmilling facilities across the country began going under the hammer as early as in the spring of 1930, with their used machines being auctioned off,” was how the annual report analyzed the situation. The used sawmill and woodworking machines that came to the market made the sale of new machines virtually impossible.

The decline in production was a trial, because interest payments and amortizations could not be reduced in the same manner as the costs of labor and raw materials. The company was forced to downsize its workforce to survive the depression. Following the layoffs, the factory was left with 60 employees.

Alongside cost cutting, one crucial factor which helped the company make it through the slump was the positive view that Hankkija’s management at the time had of Henrik Schwartzberg and Arto Pöyry, who had followed Edvin Kauppinen as the head of the office after the latter left the company in 1928 to become the director of Auran Konepaja in Turku.

Hankkija made substantial inventory purchases from Lahden Rautateollisuus in a clear attempt to help the company. The friendship between the managements had been forged during annual hunting trips to Hinttolansaari island, at the southern end of Lake Päijänne. Every year, the men sitting on Hankkija’s Board of Directors drove to Lahti in their big Stutz convertibles. From Lahti, the journey to Hinttolansaari continued in a motorboat.

FIRST HIT PRODUCT

The depression changed the demand for plywood. Instead of small cut-to-size deliveries, buyers were more interested in large pieces of thinner plywood. Henrik Schwartzberg saw an opportunity in this. He believed that Lahden Rautateollisuus should focus on developing machine models suitable to Finland’s conditions. For this work, he hired engineer Eero Raivio in 1931. Raivio was tasked with developing machines suitable for native tree species. It was no easy task, given that the machines had to be invented for the market which did not provide them yet.

In spite of this, the first veneer lathe was completed in the very same year, 1931. And it was just in time. The crisis of the plywood

IN-HOUSE TOOLMAKING

IN AN OLD INTERVIEW, YRJÖ KOKKO, THE MANAGER AND SOUL OF THE TOOL DEPARTMENT, who retired from Lahden Rautateollisuus in 1963, looks back at the kind of tool department he started working for as a young man. When Kokko joined the company in 1922, the tool department’s equipment consisted of a lathe and a drill, which was in poor condition. Orientation to the work itself was a quick affair: “There wasn’t much guidance. They put the keys in your hand, and you got to work”.

No tools were on hand; instead, every tool was made at the factory. When a part broke, the spare part was also made from scratch. And because the original part was used as a model for the spare, some errors were always made in the checking of measurements and in the manufacturing. The system of fits which facilitated the reproducibility of the parts was not introduced until years later, when the brothers Aarne and Pauli Mustakallio trained the tool designers to use the new system.

Besides his professional skills, Kokko relied on the books he brought along with him to the factory, including a manual and textbook for metal turners published in 1896 (Käsi- ja

Oppikirja Metallisorvareille Ruuvikierteiden Sorvaamisessa).

When Lahden Rautateollisuus began using high-speed steel (HSS) blades after the recession in the 1930s, there were not enough of them for everyone, and they were kept a close eye on. The master workman who oversaw work in the tool room tightly controlled the work for which and to whom the HSS blades were given. The same applied to files— you were only given a new one when the old one was so blunt and slippery that you could no longer get any bits at all off the object you were filing.

The company kept the tool department and toolmaking going until the early 1990s, even though the market already provided ready parts and tools. The in-house production ensured that the right kind of tool was available for each job and machine. The toolmaking also supported the continuously growing servicing business.

Matti Soikkeli was the last head of the tool department. When he retired in 1992, the department was closed, and the parts manufacturing was outsourced to partners.

industry in Finland lasted until 1933, after which the industry began growing strongly and swiftly. The market welcomed the veneer lathes designed for the needs of domestic industry with open arms and the lathe became Lahden Rautateollisuus’ first true hit product. Inspired by this, the company expanded its range and was soon manufacturing machines for nearly every work phase, including several different sizes and types of veneer lathes. The “*jointing machinery*” for plywood developed by the company at a later stage was sold to nearly every plywood mill in Finland. The three-drum plywood sanding machines were also sold abroad. For a long time, the company was the only manufacturer of important plywood machinery in Finland.

BACK TO FULL EMPLOYMENT

By 1933, the depression was all but history, and the number of employees at the factory had risen to well over a hundred. New hires were sought from every corner of the country with the help of newspaper ads, for example: “*A few skilled turners and filers can be provided with longer-term employment immediately.*”

The factory celebrated its 25th anniversary by holding a party and staging a theater performance for the staff. Business associates were wine and dined at Lahden Seurahuone.

Temporary commissions, like machines for a match factory and a potato starch factory, and the increasing shift of production to machine building resulted in a reshuffling of work and the machine departments’ work schedules, which helped the factory keep up with the orders. The orders on hand did not yet enable an expansion of the facilities or other major investments. The factory’s own machines were nevertheless replaced little by little. New lathes were purchased from Sweden and the old machine tools were converted so that they were powered by individual motors. Electric cables were built into the floors, and the thicket of belts in the ceiling which made the factory dark and shabby-looking could finally be removed, and the machines rearranged. This improved job comfort and occupational safety considerably.

By 1937, all the factory jobs were already filled. Although product prices had not yet risen, there was plenty of work. The prices of raw materials were increasing substantially, however, in some cases by as much as 30–50%. The company employed an average of 235 factory

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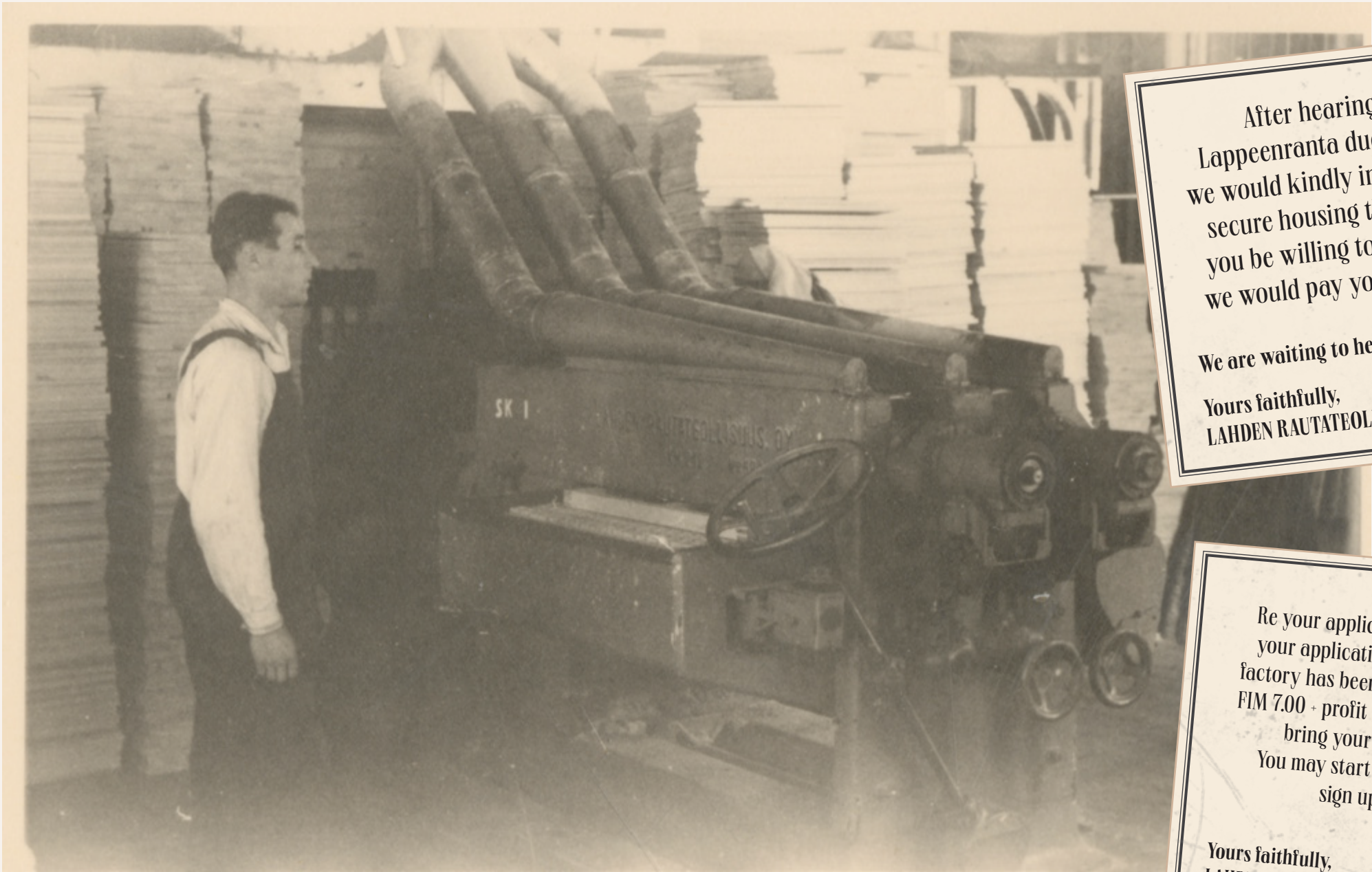
Alongside cost cutting, one crucial factor which helped the company make it through the slump was the positive view Hankkija's management at the time had of Henrik Schwartzberg.

workers, 20 engineers and designers, and 10 office workers. To ease the housing shortage which complicated recruitment efforts, the company bought an apartment building in which to house its employees.

In 1938, the company paid the factory's woodworkers FIM 5–6 an hour, and its metal workers FIM 10–12 an hour. The engines consisted of 60 electric motors with a combined power of 400 HP. The wages paid by the company totaled FIM 3.8 million, while its entire production was worth FIM 11.4 million. The value of raw materials used per year came to FIM 4.8 million. The company expanded the machine department and the office building for tool design and the foremen. The Winter War, which broke out the next year, interrupted the remodeling of the old buildings, which was not resumed until years later.

Henrik Schwartzberg retired in 1938. His sons, Pauli and Aarne Mustakallio, both of whom held master's degrees in engineering, took over the company's management. Aarne began work as the governor, or managing director, while Pauli had already begun working as the technical director a year earlier. The brothers faced the challenging task of piloting the company through the difficult years of war, executing the reparations and eventually adapting the company for peacetime operations.

Hankkija's representatives on a hunting trip. Photo: Henrik Schwartzberg's home album.



The job situation improved slowly but surely. New employees were sought with the help of newspaper ads, for example.

January 11, 1935

V. Starck, Turner,
Lappeenranta
Untamonkatu 24.

After hearing you had returned to Lappeenranta due to a shortage in housing, we would kindly inform you that you may now secure housing through our factory. Should you be willing to come to work immediately, we would pay you FIM 6.50 an hour in wages.

We are waiting to hear back from you.

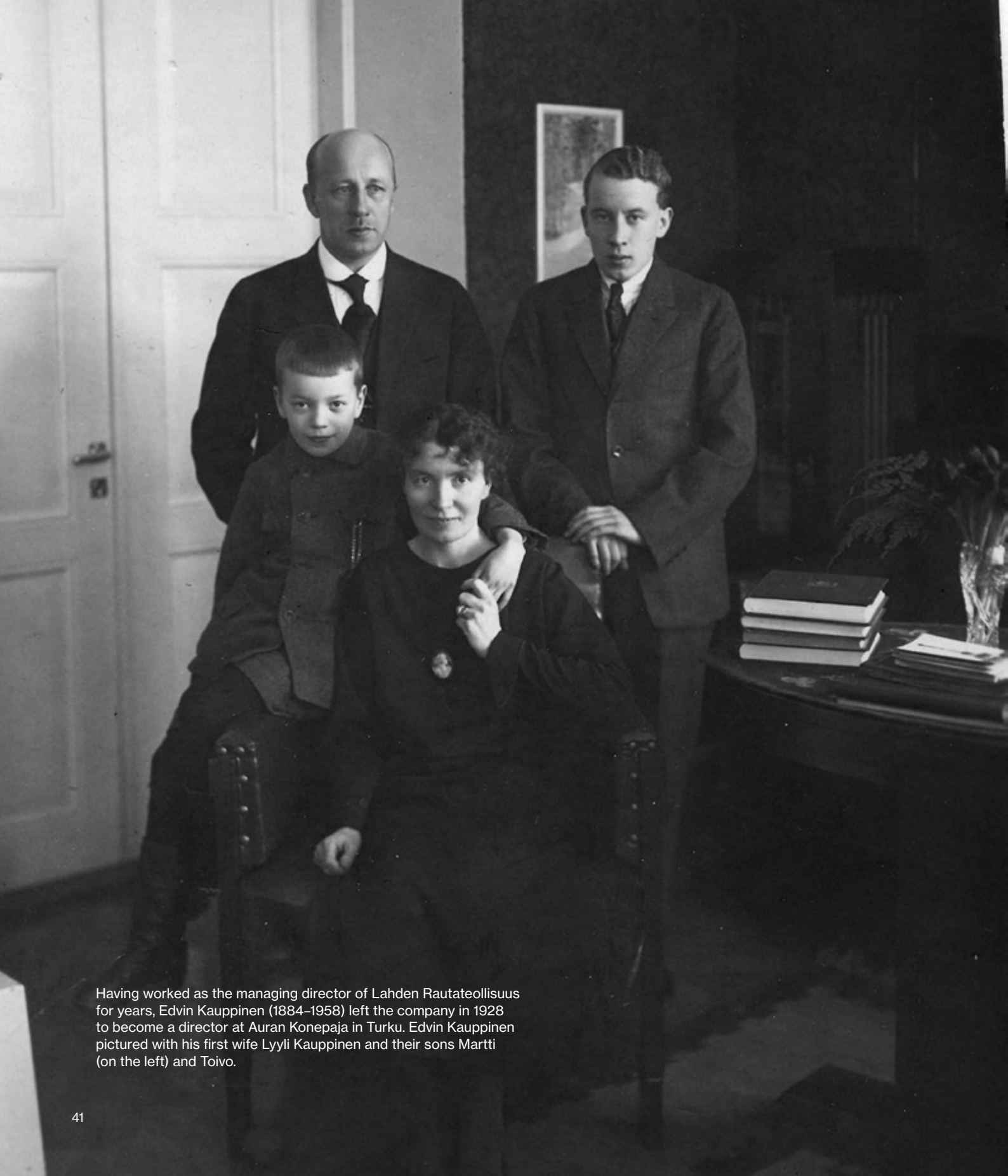
Yours faithfully,
LAHDEN RAUTATEOLLISUUS O/Y

January 15, 1935

Kalle Sulkio, Turner,
Tampere
Kalevanpuistotie 9, 22.

Re your application, we hereby inform you that your application for the post of a turner at our factory has been accepted. Your hourly wages are FIM 7.00 + profit for piecework. It is hoped you can bring your own measuring equipment. You may start work immediately and should sign up at our factory office.

Yours faithfully,
LAHDEN RAUTATEOLLISUUS O/Y



Having worked as the managing director of Lahden Rautateollisuus for years, Edvin Kauppinen (1884–1958) left the company in 1928 to become a director at Auran Konepaja in Turku. Edvin Kauppinen pictured with his first wife Lyyli Kauppinen and their sons Martti (on the left) and Toivo.

PROFILE

A HUMANE DIRECTOR

Kansallis-Osake-Pankki hired the Iisalmi-born Edvin Kauppinen as governor, or managing director, of Lahden Rautateollisuus Oy in 1913. Kauppinen, who had worked in the Rautakauppa Alsta hardware store, understood numbers, and was tasked with getting the operations of the company, teetering on the verge of bankruptcy, back into the black.

Kauppinen and naval engineer Henrik Schwartzberg, who had joined the company as its technical director a couple of years earlier, proved a good team. Kauppinen restored the company to financial health, while Schwartzberg developed new technology. Together the men began forging the company into an international success story.

Kauppinen was also active in the development of Lahti. He was a member and the secretary of the Board of Lahden Liikemiesyhdistys; a member of the Board of Lahden Säästöpankki; a member of the Lahti section of Kotimaisen Työn Liitto; a member of the Board of Lahden Kauppakoulu; a member of the Lahti City Council; a deputy member of the town's treasury; and the head of the finance and purchasing department of Häme engineering district's Lahti technical department.

Kauppinen also honed his skills beyond Finland's borders. According to a publication on Finnish businessmen from 1948 (Suomen liikemiehiä), he had made fact-finding trips to Germany, Switzerland, France, England and Belgium.

Kauppinen and Schwartzberg went around the prison camps to get men they knew back to work, simultaneously saving the men from almost certain execution.

Legend has it that Kauppinen had a wad of dollars with him on his trip to Germany. During the prevailing hyperinflation, he bought the beerhouse he was spending an evening at, given that it was available “*at a bargain price*”. Unfortunately, the story does not include information on the beerhouse’s later fate.

After the Civil War, once the Germans and the White Guards had taken over Lahti on April 20, 1918, Kauppinen served for a brief time in the first battalion of the northern Häme regiment, commanded by Major Hans Kalm, and as head of the transportation department—in other words, the horse-drawn vehicles—at the Lahti chapter of the Civil Guard.

Less than a month later, he moved from national defense duties to re-enlisting workers for the factory—Kauppinen and Schwartzberg were in a hurry to get the factory up and running again. The two went around the prison camps, getting men they knew back to the factory and to work, saving them from almost certain execution. In addition to the factory’s interests, this was based on humanitarian considerations.

Toward the end of the war, a shrapnel shell fired from Teivaanmäki at the streets running parallel to Aleksanterinkatu hit a bay window of the apartment in which Kauppinen and his family lived, destroying the living room. Luckily, the family was in the kitchen and no one was hurt. Edvin Kauppinen was awarded the Civil War commemorative medal in 1919.

Kauppinen worked as Henrik Schwartzberg’s colleague and boss until 1928. The men shared an office in which they planned the company’s future. Rather than relying on a secretary, both took care of their own affairs themselves.

When Schwartzberg wanted to change Lahden Rautateollisuus into a family business and train his sons to be future directors in it, Kauppinen sold his share of the company to Schwartzberg and moved to Turku, where he became a partner and the governor of Auran Konepaja. Auran Konepaja’s products ranged from scales, familiar to Kauppinen from his time at Rautateollisuus, to other household appliances, including laundry mangles.

In the early 1950s, the city of Turku expropriated Auran Konepaja’s lot for the public transport service’s transport halls. The aging Kauppinen no longer felt up to setting up a new factory, and his sons had chosen their own paths—Toivo was a judge and writer, Martti was the municipal physician of the rural municipality of Rauma. Given that



Edvin Kauppinen (on the right) with his father on the pier of his villa on the island of Isosaari. Before a road connection to the island was built, his commute from the villa to the office entailed trip on a motorboat owned by Lahden Rautateollisuus to the port of Lahti, from where he continued to the factory in a horse-drawn cab.

a successor for the machine shop could not be found in the family, the shop was closed down.

Kauppinen’s first wife, Lyyli Kauppinen (née Svahn), died in 1925. Edvin later married Hildur Kauppinen (née Bergman). In addition to Toivo and Martti, the family included the daughters Aira Annikki and Aune Marjatta, both of whom died as the result of an epidemic in 1915.

Henrik Schwartzberg succeeded Edvin Kauppinen as the governor of Lahden Rautateollisuus. Arto Pöyry from the town of Kotka was hired as head of the office and signing clerk.

Kauppinen’s grandson Veijo Kauppinen worked at Raute as a production manager in the 1960s, before his career as a professor.



Henrik Schwartzberg in his office in the 1930s.

PROFILE

“YOU HAVE TO HOWL WITH THE WOLVES THESE DAYS”

Henrik Schwartzberg was born on July 2, 1875, in Heinävesi and completed his degree in mechanical engineering at the Polytechnic Institute in 1899. He completed a degree in naval engineering in Sweden, worked at shipyards in Sweden and Germany, and as a shipbuilding engineer in the United States. After returning to Finland, he worked as a shipbuilding engineer at the Hietalahti docks in Helsinki between 1904 and 1911. At the same time, he taught shipbuilding at the Polytechnic Institute and the Technological University of Finland. He continued his work as a teacher until 1913, even though he and his family relocated to Lahti, where he joined Lahden Rautateollisuus as its technical director, in 1911.

Schwartzberg's family included his wife, Hanna (née Gummerus), and eight children, one of whom, Simo, died at a very young age. Three of his sons—Pauli, Aarne and Heikki Mustakallio, all of whom had master's degrees in engineering—continued their father's work at Lahden Rautateollisuus. Professor Eero Mustakallio served as chair of the Supervisory Board between 1974 and 1985.

The Schwartzbergs also had three daughters—Iltta Keskiaho, Pulmu Kirmo and Kaija Suominen. The last-mentioned one was the

Henrik Schwartzberg

Lahden Rautateollisuus Oy's technical director, 1911–1928; governor, managing director, 1928–1938, and chair of its Board of Directors until 1941.



Henrik Schwartzberg (right)
at 28, when he was studying
and working in the United
States.

“Nowhere have I seen machinery as perfect as in these factories. The shipbuilding machines have been specially built for New York Shipbuilding Co., meaning they are the only ones of their kind in the world. They all run on electricity. Our entire large company is founded on a wholly novel work system. Its two principles are: 1. To use many draftsmen and only a few cheap workmen. 2. To build ships by the dozens. This system has one more major advantage and that is 3. the accuracy of the work. The shape of the ships launched is precisely the shape intended.”

**EXCERPT FROM A LETTER
WRITTEN TO HENRIK'S FATHER,
JOHANNES SCHWARTZBERG,
ON JUNE 13, 1903.**



Hanna Schwartzberg was a nurse by training. In this picture from her youth, she is wearing a nurse's uniform.

Whereas his spouse
Hanna did not consider it
important for the family's
girls to graduate from
high school, let alone
attend university,
Henrik disagreed.

artistic director of Huonekalutehdas Sopenkorpi between 1950 and 1981.

Employees considered Schwartzberg a kind and just, but also a fastidious and exacting, director. He came to work promptly at eight o'clock every morning. *"You could have set your timepiece by his arrival,"* said Eino Salo, hired by Lahden Rautateollisuus in 1924 as a broach driller, in an old interview when reminiscing about the Engineer, as Schwartzberg was called at the factory.

At 9 o'clock sharp, Schwartzberg began a tour of the factory, visiting all the departments. During these rounds, he discussed the work underway with the foreman of each department. At the end of a round, he reviewed the ongoing plans at the drafting office with that department's supervisor, engineer Nyström. The design of the machines, as well as their improvement and meticulous production, was especially close to Schwartzberg's heart. He performed the cost calculations for orders himself and refused to reduce prices if he thought the work's profitability would suffer. Nor was he easily swayed into changing the machine structures he himself had designed.

Schwartzberg had a large black notebook on his desk in which he briefly jotted down any issues that arose during a day with ink and a fountain pen.

In addition to working life, Henrik Schwartzberg's open-mindedness and tolerance extended to the raising of his children. Whereas his spouse Hanna did not consider it important for the family's girls to graduate from high school, let alone attend university, Henrik disagreed. He told his wife *"you have to howl with the wolves these days"* and the family's daughters also ended up studying at university.

The family led a modest and *"frugal"* life. One employee recalled seeing Schwartzberg wear the same overcoat for at least 20 years. In the



Henrik Schwartzberg at home on Rautatienkatu.

Schwartzberg was
a founding member of
Kotimaisen Työn Liitto
in 1912 and sat on its
Board for a long time.

summer, the director could be spotted arriving at work on a three-speed bicycle. He rode a bicycle when moving about the town, but purchased a Nash car when cars began appearing on roads, and was one of Lahti's first car owners.

Schwartzberg represented a new generation in Finland's metal industry, one whose activities resulted in the industry's production shifting to a new and more advanced path. Under his leadership, Lahden Rautateollisuus developed into a family business representing modern technology at the same time as the company's ownership was concentrated in the hands of Schwartzberg and his family.

The factory owner was also active in local politics, first as a representative of the Finnish Party and subsequently the National Coalition Party. In 1914, Schwartzberg was elected to the city council. He was the council's president between 1919 and 1932. He was also a founding member of Kotimaisen Työn Liitto in 1912 and sat on its Board for a long time. As of 1919, he was also a Board member in the Employers' Association of the Finnish Metal Industries. Schwartzberg worked in the management of Lahden Rautateollisuus, first as a technical director and later, from 1911 to 1938, as its managing director. He retired in 1938 and died in 1946. Hanna Schwartzberg took over as chair, or supervisor, of the Board of Directors after her husband. Her son Aarne Mustakallio acted as her deputy.

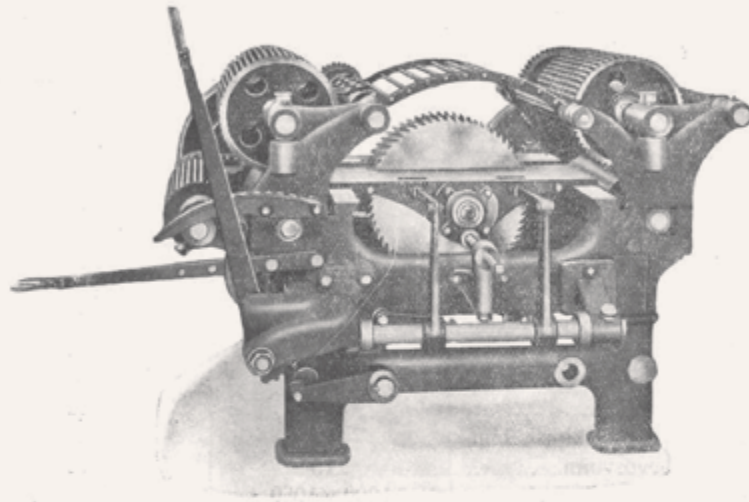
Henrik Schwartzberg was awarded the Civil War commemorative medal in 1920.

LAHDEN RAUTATEOLLISUUS O.Y.

Sähköosote: VALIMO

LAHTI

PUHELIMET 200 & 430



Vasenkäätinen.

Särmäyssaha N:o 3

Kuulalaakereilla varustettu.

Särmäyssahoissa N:o 3 on otettu käytäntöön kaikki viimeaikaiset parannukset sekä särmäystyön jouduttamiseksi että ihmistyön helpoittamiseksi. Niinpä minkäänlaista valssien nostamista puuta särmäyspöytään johdattaessa ei tarvita, vaan vetää kone laudan sisäänsä, kun lauta vaan tulee valssien kosketukseen. Tämän vuoksi ovat ylävalssit suuria, konevoimalla käypiä ja uurrettuja, ja viides konevoimalla käypä apuvalssi on järjestetty siihen päähän särmäyspöytää, johon lauta johdetaan.

Laudan leveyden järjestäminen tapahtuu pystyvivun avulla, ollen se tapa työläiselle paljon mukavampi kuin sivullepäin liikuteltavaa vipua käytettäessä. Myös tapahtuu liikuteltavan terän salpaaminen määrättyyn asentoon siten, että teräpöytää liikuttelevien vipujen joustavuus ei laudan leveyteen vaikuta.

Kone on rakennettu käyttämällä kussakin paikassa sopivaa rakennusainetta sopivissa ainevahvuuksissa, joten aivan uudenaikainen ensiluokkainen särmäyssaha on saatu aikaan.

Särmäyssahoissa N:o 3 on laitteet valssien takaperinkäyttöä varten, jos lauta koneeseen ohjattaessa on joutunut vinoon.

STORIES FROM RAUTE

CUTTING-EDGE TECHNOLOGY

Henrik Schwartzberg, and later his sons Aarne and Pauli Mustakallio, were extremely interested in technological advances and set high quality standards for the design of both machines and scales from the outset.

Family legend includes an amusing anecdote about Henrik's talent as an engineer. In the early 1920s, he designed a transmission which shifted gears smoothly, without kicks or jerks, for adjusting the speed of a saw log as it passed through a gang saw. He secured a patent for the transmission and told his family that he intended to offer it to Ford Motor Company in the United States. Schwartzberg had lived and worked in New York as a young man, and was therefore familiar with the country and its culture. He thought the transmission would work well as a car's gearbox. He soon noticed, though, that a transmission working according to the same principle appeared in Ford's Model T car, and promptly abandoned his plan.

An article from 1955 which discusses the metal industry in Lahti noted the following on the product development of Lahden Rautateollisuus: *"It could be said that this development work carried out at the factory is stronger and more thorough than ever, because the wood processing industry is always facing new problems that need to be solved. A modern first-rate woodworking machine*

“A unique invention in Finland” ran a headline in the newspaper Helsingin Sanomat on November 9, 1956.

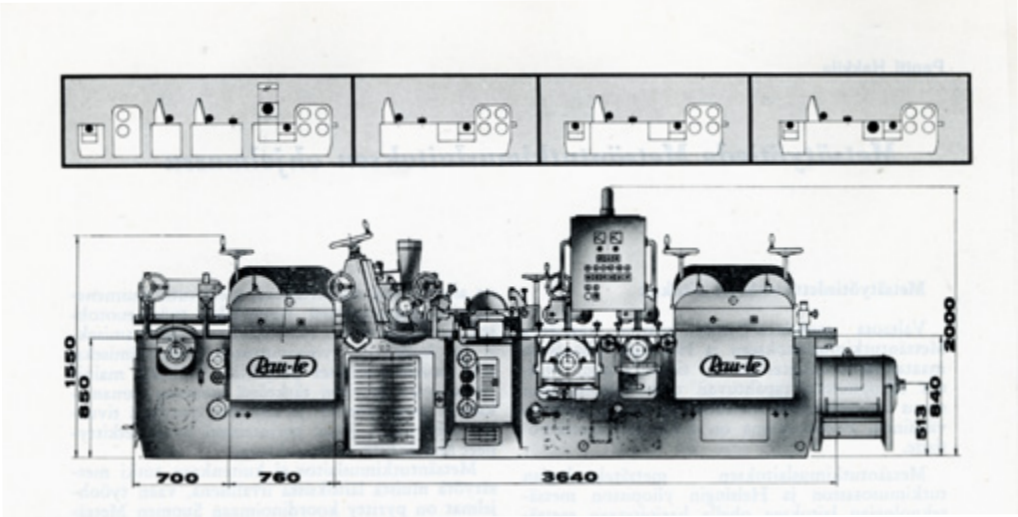
is by structure a precision machine, figuratively speaking in the exact same manner as a metalwork machine. Although the piece worked on is wood, the machine must perform its job with a great degree of accuracy. Depending on the requirements, the quality of a smoothing planer's or other straighteners' work must be straight to a point of up to hundredths of a millimeter to avoid errors at a later stage. Great demands are always set for a machine's performance, because the quality of the work done depends on it.”

“A unique invention in Finland” ran a headline in the newspaper Helsingin Sanomat on November 9, 1956. This article focused on a machine-fed, combined smoothing and parallel planing machine, the feeding and smoothing device of which was unique in its simplicity and efficiency, even on a global scale. The idea for the machine came from the then governor of Lahden Rautateollisuus Oy, Aarne Mustakallio, while engineer Harry Sandberg saw to its implementation. Vakiopuu Oy was the first company in Finland to purchase the machine. The company commented on its purchase by noting that the invention was a perfect match for the requirements Vakiopuu Oy set for its machines. The machine's efficiency was four times that of a conventional manual machine. Thanks to the combination, the number of people required for the work fell from five to two and the quality of the work improved. It also reduced the intermediate stacking, storing and load transfers.

NEW SELLING POINT

The block centering device placed in front of the dual spindle lathe on a turning line, developed by design engineer Jorma Kuuva in the 1960s, was an important selling point, increasing the recovery of veneer. The “centering” designation was derived from the fact that the device had a three-part “jaw”, which lifted the log and positioned it in the right place mechanically. The device's mechanical grapples positioned the log to be turned more precisely between the spindle grippers, and the wood's recovery in the turning improved. This translated into less waste and more veneer.

The mechanical block centering device served for decades, until an automated version of it relying on laser technology was developed. The change improved the wood's recovery enormously, by as much as 15 percent. Nowadays, point lasers have been replaced by fanned

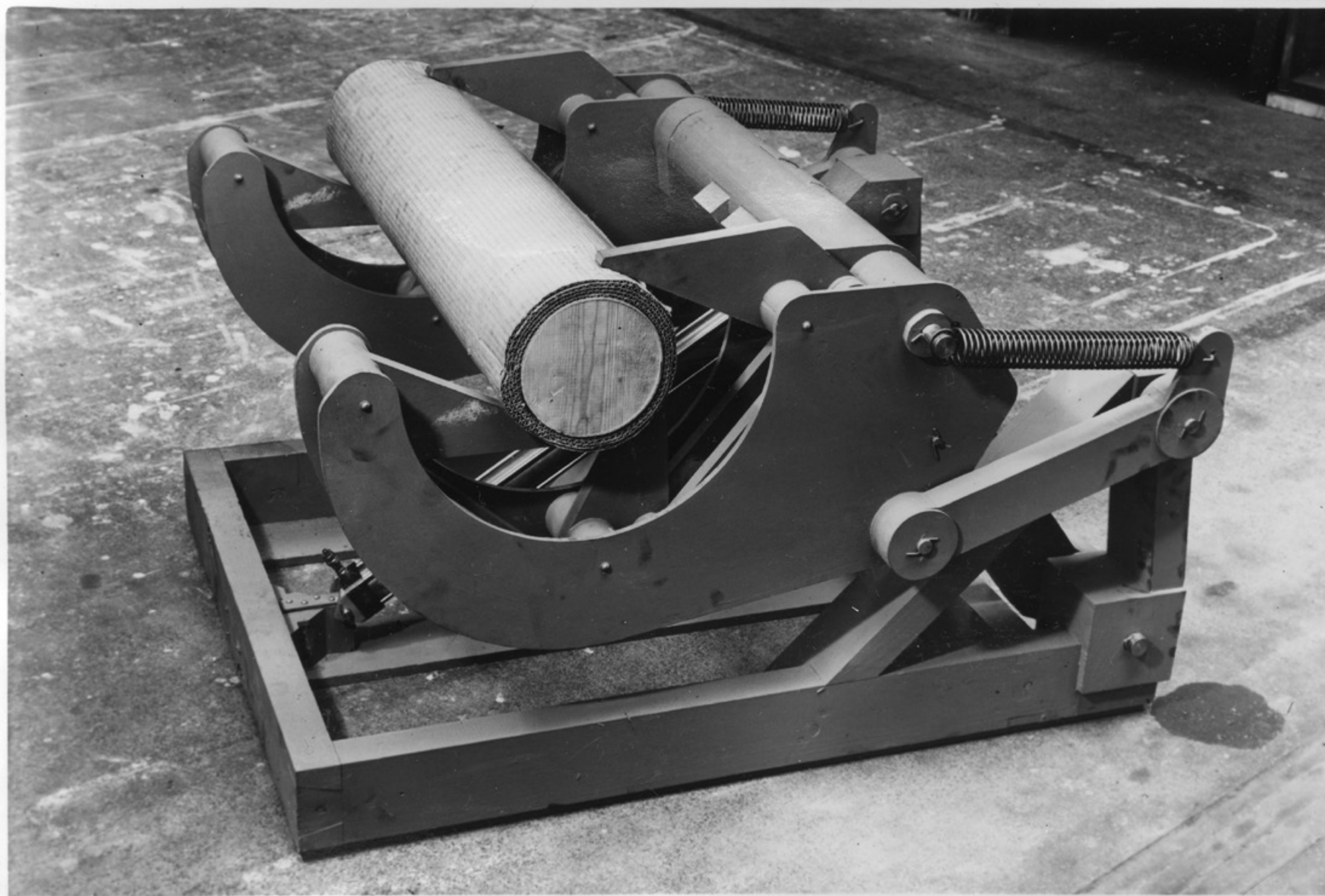


A Rau-te H10 planing machine in 1970.

laser modules, and the recovery has improved even further, by a few percentage points.

In addition to the block centering device, the 60s saw new production-line thinking and the development of automated production processes for the company's veneer technology. Lahden Rautateollisuus began to change from a supplier of individual machines to a project supplier of entire production lines and veneer mills. This was a significant change which required investment in product development. It was also the reason the company hired a great many new design engineers during the 1960s and 1970s. The third floor of the head office where they worked quickly became crowded. More space was leased from the furniture manufacturer Häkli's vacant premises in the adjacent lots.

“Lahden Rautateollisuus also represented the then exceptional special technical expertise among the town's industrial facilities, and its product development was in a league of its own: the products of Rautateollisuus were unique, based on its own development work. They also met high quality standards, due to which the company was able to penetrate the international markets as a machinist for the wood industry,” writes Teppo Vihola in his book on the history of Lahti.



The block centering device allows the log to be positioned mechanically so that the recovery improves, or so that the log yields more veneer when turned. The mechanical block centering device was introduced to the market in the 1960s. An automated version relying on laser technology was developed in the 1980s. With a laser block centering analyzer, the recovery improved by as much as 15 percent. Today, the block centering analyzer uses fanned laser modules instead of point lasers, and the recovery has continued to improve by another few percentage points.



STORIES FROM RAUTE

MORE THAN HALF A CENTURY OF FOUNDRY OPERATIONS

“The casting ladles are the nerve center of the foundry, and not just as brightly glowing points, but as something that sets the pace of the work,” was how the newspaper Lahti described the foundry of Lahden Rautateollisuus in February 1949.

Foundries were an inseparable part of the operations of machine shops in the old days. Even the names of many machine shops included both of the words: *“machine shop and foundry”*.

“Last year, the factory reported a total of 1,187 workdays lost due to injury or disease. The figure has declined from the previous year. We should remember that burns heal less slowly than other injuries resulting from work. [...] When an accident occurs, the employee is immediately taken to a clinic or the military hospital, if the first aid proves inadequate. The income for the period of sick leave is ensured by the metal industry’s collective agreement,” continues the article in the Lahti paper. The factory’s doctor was Haakon Kurze.

Lahden Rautateollisuus already housed a foundry when Edvin Kauppinen and Henrik Schwartzberg took over its management. The new and improved foundry was completed just before the Civil War broke out. The foundry was on the bottom floor of a two-story

A view of the foundry in the 1930s.
In the photo, hot iron is being poured
from a ladle into a mold.



building, the top floor of which housed the pattern shop which made wooden casting patterns. At its busiest, the pattern shop had well over a dozen men whittling the casting patterns.

Both floors were run by their own foremen. For decades, the pattern shop was managed by Juhana “Janne” Pesonen. In the 1960s and 1970s, the foundry was run by engineering technician Olavi “Olli” Liesi.

A FEW CASTING DAYS A WEEK

The casting was hot and dirty work, which is why it was carried out during only a few of the “casting” days in the week.

In the casting, billets and scrap metal were melted in a hot cupola furnace. The casting itself took place by pouring the melted ore from

Late 1930s, Lahti. Photo: Aarne Pietinen

the furnace into the feed cavity of the sand mold, bound by soot and bentonitic clay. This was the job of the casters.

If the casting had to include hollow cavities, they were achieved with the foundry cores made by the core makers. The foundry cores were separate parts of a casting mold which formed a hollow cavity of the desired shape in the casting. Foundry cores were placed in the casting mold when necessary.

In an interview published in 1984, Johannes Korkka, who joined the company in 1945 as a manual molder, said that work at the foundry began with what was referred to as the foundry crash course. The teachers at the course were Kalle Rautio, engineer Urho Paikkala and work planning manager Eero Raivo. Once the course had been completed, the new employee began the actual work, which involved the end casings of the veneer lathes. Work began at six in the morning and ended at nine in the evening. It was piecework, because the frames made from sand and clay had to be ready for drying by the evening—at the time, jolters or other apparatuses for emptying the frames were not yet available; instead, the work was done manually. The jolting Jähle molding machines used in the manufacturing of small parts were not introduced to the factory until years later.

HOT CHORES

The foundry was fitted with an overhead, or bridge, crane. In the 1970s, the crane was operated by an older lady whose office was high up in the foundry’s ceiling. She sat there on the casting days, and when the ladle filled with the molten iron was ready, she put aside her knitting, lifted the ladle from the floor with the crane and poured the liquid into the mold.

Markku Lindgren, who joined Lahden Rautateollisuus Oy in 1969, remembers how the heat and soot rose to the foundry ceiling during hot summer days, causing the lady to pass out every once in a while. When this happened, the casting was interrupted, and the men carried the lady out into the yard to recover. Once she had recovered, she went back to work and the casting was completed.

When the casts had cooled down, they were dug out from the sand and cleaned. This was messy work, even in a foundry where the work was not clean to begin with. Especially during casting days, you could therefore see a black path running from the foundry to the locker room across the yard.



1930s, Finland, Lahti Photo:
Aarne Pietinen

According to town—or more like foundry—legend, a foundry man washed his hands in the toilet before, rather than after, taking care of his business—the tidiest ones undoubtedly washing their hands afterward as well.

Although staff facilities were what they were those days, there was always warm water for washing your hands, given that it was available by dumping a burning hot piece of iron in the water receptacle. Washing up became easier when the western end of the factory was converted into a sauna for the casters.

The 1960s were good times at the foundry. Foundry manager Olavi Liesi traveled across Finland selling the casts of Lahden Rautateollisuus, and the factory had plenty of work to do. As late as at the beginning of the 1970s, the foundry looked robust. Its annual production was around a thousand tons, which accounted for roughly one percent of Finland's total casting production.

THE FINAL CASTING WAS POURED ON SEPTEMBER 15, 1976.

Occupational safety regulations tightened midway through the decade. For the foundry to have continued its operations, bulkier air conditioners would have had to be fitted in it. Raute decided to build a larger and better foundry and to relocate it. The industrial lot, which was once located on the outskirts of the town, was now in the middle of it due to the town's growth, and the foundry, which tended to cover things in soot, was the object of public disapproval.

Production manager Veijo Kauppinen and Olavi Liesi were tasked with designing the new foundry. To this end, they made fact-finding trips to foundries in Germany and Sweden. After they returned home, they designed an iron foundry three times as large as the existing one with an annual production capacity of three thousand tons. After a fairly long search, a location for the new foundry was found in Nastola, then a neighboring municipality of Lahti. Everything was ready.

But just before crossing the finish line, the company's Board nevertheless decided to close down the old foundry and not build a new one. The decision proved a good one. The foundry's completion would have coincided with an economic downturn, leaving the company with a sizable investment and little work on its hands. Moreover, the money for what little work might have come its way would have been dismal.

After the foundry closed down, some of the frames of the company's products were changed from cast to welded structures. The decision was spurred by the in-house welding shop completed at the Nastola factory. The casts the company still needed were commissioned from subcontractors.

The foundry's final casting was poured on September 15, 1976. After this, the facility was converted into an assembly hall for planes. The foundry's approximately 30 employees found new jobs either at Lahden Rautateollisuus or other companies in the area. The pattern shop continued to operate for another few years, because the patterns were still needed, and old patterns needed to be serviced.

"In addition to professional skills, the iron industry requires strength and good physical fitness. This fitness is accumulated in the form of shared sports. The company has its own soccer team and baseball team, besides which the employees ski, exercise and swim together—sharing omnivorous tastes," was how the newspaper Lahti concluded its article on the foundry of Lahden Rautateollisuus.



PERIOD OF WARS AND WAR REPARATIONS

**MUNITIONS PRODUCTION
1939–1944**

1939 The turner’s shop for ammunition in the machine warehouse buildings is relocated to Heinola.

1942 The special machinery procured by the Ministry of Defence’s department of war economy for the manufacturing of heavy artillery shell casings is placed in the facilities of Lahden Rautateollisuus.

**PERIOD OF WAR REPARATIONS
1944–1952**

War reparations demand a great effort from Lahden Rautateollisuus. The company delivers 1,199 wood processing machines to the Soviet Union. During the first years, 80.5 percent of its production is allocated to war reparations.

1944 The scale factory is split off to form a company of its own. The new company is named Lahden Vaaka Oy.

1945 The operations stabilize and the furniture factory Sopenkorven huonekalutehdas is established as a testing facility for woodworking industry machines.

Aarne Mustakallio begins work as the technical director of the delegation of the war reparations industry (Sotakorvausteollisuuden valtuuskunta) alongside the factory’s management.

1948 The company’s 40th anniversary is celebrated amid the busiest production of war reparations products.

1949 The company employs 500 people, the scale factory included. More than ever before.

1952 The last war reparations delivery leaves the factory on May 30.

The factory holds a small function to celebrate the end of the reparation deliveries.

1939

1952

TURNING SHELL CASINGS

The war (1939–1944) presented demanding new challenges for Finland's industrial sector. The Winter War took the men fit for combat to the front and caused complications in the availability of raw materials. This was also felt at Lahden Rautateollisuus. Given that the power and precision of the company's existing machinery were ill-fitted for the new working methods and the new and efficient hard alloy, the factory needed new machines. Lahden Rautateollisuus's contribution to the production of the munitions industry also influenced the modernization.

While state-owned companies made most of the munitions, significant amounts of them were also ordered from other suppliers. Different types of ammunition, for example, were manufactured at nearly 40 machine shops, one of which was Lahden Rautateollisuus. The company's turner's shops manufactured the 76 mm shell casings for the light artillery cannon used as the army's main artillery piece.

The work was not only important, but demanding and precise. The government provided detailed instructions on how the shell casings were to be handled and expected the instructions to be followed. For example, you were not permitted to jot down notes on raw materials on the follow boards. Instead, semi-finished follow boards made from a similar board were kept in boxes. In addition to the foundry marking, machining factories furnished finished shell

Lahti railway station after a bombing in 1940.

casings with paint markings made with at least 10 mm tall letters and numbers—black when added to a casing painted red, and yellow when the casing was painted black. The place of the paint marking was also strictly specified.

The threat of air raids meant the work was located away from the company’s other operations. In the fall of 1939, when the general mobilization began, the turner’s shop manufacturing the shell casings in the machine warehouse building was relocated to a building of the Virtanen car repair shop in Heinola. Another turner’s shop for the casings was set up at the cottage industry school in the Möysä district of Lahti. The factory itself continued to house the tool department, the main part of the machine department, the scale department and the foundry. Two men with rifles on their shoulders walked around the grounds round the clock, guarding the factory.

Pentti Salminen, who was hired as an errand boy for the scale factory in 1939, was tasked with alerting the office in the event of an air raid and with being the last person inside before hurrying to a shelter. Before the company had its own air-raid shelters built, the employees had to run to a shelter at nearby Metelinmäki. One of its eventual air-raid shelters was next to the wooden head office, and the other underneath the foundry’s warehouse. After the war, the air-raid shelters were used as potato storages.

The frequent air-raid warnings disrupted work. Soon after the war broke out, working hours were therefore pushed back to start at 4 P.M., because most of the warnings occurred during the daytime. This reduced the number of working hours lost due to the warnings.

While the factory building itself was not hit at all during the war, the bombs that fell in the neighborhood broke windows, and the company building on Saimaankatu was damaged so badly that it had to be torn down.

The office had a person on call around the clock for civil defense duties. An on-call team composed of 8–10 men worked in a designated room set up on the top floor of the foundry.

HEAVY LABOR

The manufacturing of shell casings on the line was simple production line work. The machines and tools needed for the turning were made at the factory. This was the only way to ensure that the machines, which wore down rapidly, were always available.



A metal artillery shell missing the fuse at the nose cone. A flat-bottomed ogive cylinder with a brass ring on the nose. There is a deep hole in the middle of the ring on the nose. There are two grooves on opposing sides at the brass ring's sides. A brass band with grooving can be seen halfway up the cylinder. The groove circles the bottom end of the shell. Photo: The National Museum of Finland

Veijo Kauppinen, production manager and grandson of Edvin Kauppinen, the company’s managing director during its early years, says that sending skilled metal workers to the front was a common mistake during the Winter War, given that they were then looked for everywhere and pulled away for work in factories. This also becomes apparent from a letter sent by Lahden Rautateollisuus to the military staff on January 15, 1943, in which the company inquires whether private M. E. Klemelä could be sent back to work from the front. *“Given that Private Klemelä’s family members have told us that he cannot be ordered into the field, and that he could be exempted from his current duties to be employed in our shell casing turner’s shop, where he worked as a turner before being called up for military service, we would like to inquire whether such a transfer would be possible”.*

In another letter, the company adopts a slightly different tack in requesting the military staff to assist it in recruiting workforce: *“As we will in the near future be needing a workforce for the 122 shell turner’s shop and the second shift of the 155 shell turner’s shop and will, to that end, contact the labor committee of Lahti, we would, with the utmost courtesy, request that the labor officials in Lahti be informed of how important it is to secure this workforce. It is our understanding that said measure would be extremely helpful in terms of workforce requests”.*

Because it was so difficult to secure skilled labor, the foremen of the turner’s shops led a workforce largely composed of unskilled workers. One was Olavi Siirola, who began working as a turner of shell casings at the age of 15. He says that workdays at the turner’s shop were long, between 10 and 12 hours, and that work was carried out in two shifts. And given that the shells weighed 43.5 kilos (almost 96 pounds), the youngster was dog tired after each workday. Siirola remembers falling asleep while riding his bike home one evening. The town had been blacked out because of the war, and sleep took over the young man while he was riding down a gentle slope. Siirola ended up crashing into a pole and waking up at the base of it. Fortunately, he was not hurt.

By the Continuation War, the situation was different, and the company knew how to hold on to its turners.



Shell casings being made at Raute.

LIKE ONE BIG FAMILY

The Raute employees who remained at the factory also faced scarcity and restrictions to their personal freedom. According to the Obligatory Work Act enacted in the summer of 1939, everyone aged between 18 and 59 had an obligation to work. This meant that when the state ordered you to work, you had to comply with the work order. Such work was often carried out on a week's only day off, or Sunday.

"We left at the crack of dawn for the sites indicated to us by the Labor Committee. Due to the food shortages, we didn't carry much in the way of lunch with us, but the nearby houses often gave us porridge and a few drops of milk. In the fall, we worked on potato or turnip fields," said Maija-Liisa Vainio, who worked at Raute's personnel services office, when looking back on the war years in an old interview.

The hard times and shared effort brought the company's employees closer together. The team spirit was good, and most of the time the employees were like one big family—except when the authorities responsible for food and supplies distributed shoes, bicycle tires or other necessary goods at the factory. These occasions always put the team spirit to the test.

The repair and servicing of the machines were occasionally challenging because the materials for the tools were hard to come by during the war.

Allotment gardening was popular during wartime, because there was a genuine shortage of food. The company leased allotments from the town and purchased the fertilizers needed for them. The employees who wanted to use the allotments let Vainio know how many acres of vegetable patch they needed and from whereabouts in the town. There were also cellars on the factory grounds in which employees were allowed to store the vegetables they'd grown come autumn, if their own house lacked a root cellar.

Henrik Schwartzberg had a farm in Hollola from which the family delivered additional bread and butter to the employees. Vainio remembers how Pauli Mustakallio arranged for milk to be brought from the farm one Christmas Eve. This was a valuable gift at the time, and served only to increase "Pulu's" already considerable popularity among the factory's workforce.

MANUFACURING ARTILLERY SHELLS

Prior to the Continuation War, the army was provided with additional, heavier field guns. During the Continuation War, Rautateollisuus produced, in addition to the shell casings, artillery shell casings made from high-fragmentation steel. The billets for the artillery shells came from the factory that produced them.

The shell casings were made on simplified custom-built machine tools one cycle at a time. The machines were placed in a row, and the work proceeded by moving a piece from one machine to the next. One line consisted of around twenty machines. The finish was often quite rough, because it affected the fragmentation.

After the machining, a shell casing and the driving band attached to it were finished, as far as Rautateollisuus was concerned. The shell's filling with an explosive was done elsewhere.

The shell production required a large number of special tools. Their production, repair and servicing were the responsibility of Yrjö Kokko. The work was occasionally challenging, because the materials for the tools were hard to come by during the war. Kokko recalls how he often had to come up with substitutes at the shop and make various barter to get materials. The difficulties in availability also extended to machines. One even sank to the bottom of the sea with the ship that was transporting it.



Shell casings being made in wartime Finland. The turner's shop employed women in addition to men, because men were needed on the front. Photo: SA-kuva

Goods were always needed urgently, and when several shipments of tools from the Lahti factory to the turning unit at Heinola were left at bus stations overnight, despite promises to the contrary, Rautateollisuus had no choice but to start shipping the goods on trucks. The next step was to relocate the Heinola production, due to the distance, back to its familiar old place in the machine warehouse building in Lahti.

Shell casing production continued more or less without interruption until 1944. Throughout these years, the deliveries by Lahden Rautateollisuus accounted for 60 percent of all shells delivered to the artillery.

Peacetime posed new challenges for the company. When the production of the shell casings ended, the company had to find other work for the many women and men who had been working in the turner's shops. A great many former employees also returned home from the war. The company wanted to provide employment for both of these groups, and managed to do so as well. However, it was unable to place everyone in their former jobs, which meant some of the workers were given construction and outdoor jobs.

Gradually everything settled down, and in 1945, the operations began to stabilize.

The war claimed the lives of 22 Lahden Rautateollisuus employees. They were commemorated with a plaque mounted on the foundry wall, containing the names of every employee killed in action.

CLOSE CONTROL

Given that Rautateollisuus manufactured shell casings and other munitions for the defense establishment, the State Police (Valpo) probably kept a close eye on Rautateollisuus and its employees. One indication of this is a letter dated September 30, 1941, found in the National Archives of Finland, which reveals that the criminal investigation department of Lahti police had been informed of the visitors of one Tauno Pellervo Karvinen, who worked at Lahden Rautateollisuus. Karvinen had recently been receiving more visitors than seemed warranted. The informer knew that Karvinen had previously been convicted for preparing treason. At just this time, Karvinen was being visited by two men who seemed to have no particular reason for doing so.

Three police officers were sent to investigate the matter.

Karvinen was found to be hosting two leftists known to the police who were unable to state any special reason for their visit. Their only explanation for it was that they wanted to bring Karvinen coffee and discuss how he would be able to get to safety in the event of an air raid. The men were released after they were interviewed,

but Karvinen was nevertheless found to be in possession of a letter addressed to the program committee of the local union organization. The letter contained an offer to send a speaker for any *educational events*, and mentioned that the bourgeoisie was taking advantage of the times to break up workers' organizational activities by discussing cooperation between the bourgeoisie and the workers.

After the letter was found, Valpo's detectives interrogated Karvinen several times. He finally admitted to being a communist and to hoping and believing that Finland would one day have a dictatorship of the proletariat.

MASSIVE WAR REPARATIONS

In the peace treaty made between Finland and the Soviet Union in 1944, Finland was ordered to pay massive war reparations to the Soviet

The company wanted to provide employment for both of these groups, and managed to do so as well. However, it was unable to place everyone in their former jobs, which meant some of the workers were given construction and outdoor jobs.



President Paasikivi signing the war reparations agreement on August 12, 1944.
Photo: Finlandia Kuva

Over the first six years alone, Finland delivered 340,000 carloads of war reparation products to the Soviet Union.

Union. For several years, the entire country's production was harnessed for the effort to make the reparation payments. The amount of the reparations totaled 300 million dollars (USD), in accordance with the exchange rates and prices of the year preceding the war, 1938. In reality, the price of the reparations was nearly double that, or 500–600 million dollars. Over the first six years alone, Finland delivered 340,000 carloads of war reparation products to the Soviet Union.

The war reparations presented yet another enormous challenge for the production capacity of Finland's metal industry.

The payment of the reparations was overseen by the delegation of the war reparations industry (Sotakorvausteollisuuden valtuuskunta). Aarne Mustakallio, the managing director of Lahden Rautateollisuus, acted as the technical director of the delegation in 1945–46, alongside running the factory.

The war reparations program imposed on Lahden Rautateollisuus by the delegation was exceptionally extensive. Although it consisted largely of equipment that Rautateollisuus was familiar with, most of this equipment had to be redesigned and redrafted. The machines ordered for the Soviet Union differed from the old equipment and had to meet high standards.

The products' production and quality were supervised onsite by Soviet inspectors. *Even the knot sizes of the packaging crates were precisely defined.*

The consignment notes and documents were worked on late into the night. *"All machines heading for Russia had to be accompanied by Russian usage and maintenance manuals. Year by year, the Russians wanted more and more copies of the documents. Ultimately, we sent five or six copies of each and made one more set of copies for Rautateollisuus,"* says Kirsti Veneskari in an old interview, looking back on the years following the war. She joined the drafting room as a trainee in 1944.

Soviet inspectors would be seen at Lahden Rautateollisuus subsequently as well.

NEW AND OLD MACHINES

Alongside familiar machines, the program covered entirely new machines. Fortunately, the company's own machinery had been modernized and increased, and the machine shop had been expanded

A plaque commemorating the company's former employees who were killed in action during the war was revealed during the event.

with a machining, assembly and plate department in 1938, 1942 and 1943. Now it needed to expand the work planning department, contract office and drafting room, to recruit new engineer designers. Once the contract office began operations, contract calculation was transferred from the foremen to the contract office.

When the work involving the war reparations got underway, the first machines produced consisted of those that did not require changes. The veneer patching machine was the most difficult to produce; especially the production of its blades required precision and was demanding work. The company needed to develop entirely new equipment for this purpose.

In November 1948, Lahden Rautateollisuus celebrated its 40-year journey in a postwar atmosphere, amid the busiest production of war reparation products. The low-key celebration was held in the assembly hall, which was festooned with pine branches and small Finnish flags. A plaque for the Raute employees who died on the front was revealed during the event. In his speech, Pauli Mustakallio thanked all company employees for their devotion to the company.

A SHORTAGE OF EVERYTHING

“Tight situation in raw materials complicates operations of war reparations industry,” was the headline of an Uusi Suomi article published on November 9, 1946. It discussed the dire shortage of raw materials from which the war reparations industry suffered.

Most of the raw materials so badly needed by the metal industry were supplied through the delegation of the war reparations industry, which was desperately trying to import iron and steel from Sweden, the UK, France, Belgium and Czechoslovakia. But the demand so outstripped supply that availability was limited, and deliveries were difficult to secure. This translated into longer delivery times, which in turn complicated the payment of the reparations and increased the threat of heavy sanctions for delays.

The article went on to emphasize that Finland should therefore aim for increased self-sufficiency in both raw materials and machine production, while accounting for the country’s economic constraints. “We should carefully consider how to invest our limited human capital and resources, both of which are in extremely short supply these days at any given time,” it said.

The shortage was greatest with respect to foundry workers, toolmakers, machine assemblers and repair workers.

The availability of workforce was the other bottleneck of the rapidly expanding metal industry. The increasing scope of the war reparations industry was in continuous need of new and especially skilled labor. The shortage was greatest with respect to foundry workers, toolmakers, machine assemblers and repair workers. The serious lack of vocational education in the country only served to narrow the bottleneck. *“Our vocational education policy so far has been too feeble and ineffective,”* said the Uusi Suomi article.

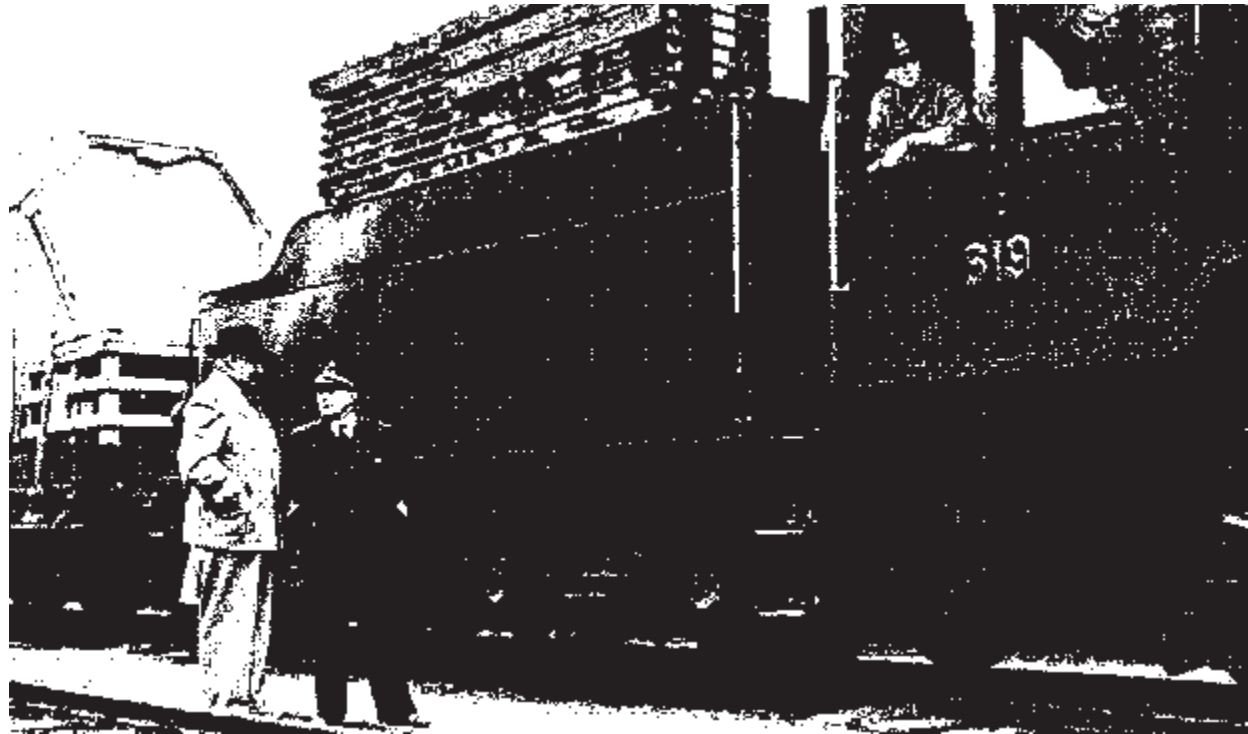
A shortage in housing production also made recruitment more difficult. Although many people would have been willing to work at industrial plants, the plants were often unable to hire them because no housing was available. One more thing contributed to the labor shortage: the “black wages market”. Many companies sought to keep production running at any cost. Besides overpaying their workers, these companies paid *“black wages”* beyond the reach of taxation.

Before the wars, between 1938 and 1939, there were approximately 45,000 metal industry workers in Finland. In the peace treaty, Finland lost 432 industrial facilities which, according to a report by the Industrial Union, had a combined workforce of 20,500 employees. Despite this, there were already 83,000 metal industry workers by 1949. The growth had nearly doubled in a matter of ten years. Lahden Rautateollisuus was no exception: including the scale factory, it had 500 employees in 1949. More than ever before.

SKILLED LABOR FROM AN IN-HOUSE DEPARTMENT

Aarne and Pauli Mustakallio tried to improve the availability of materials from Finland and abroad by increasing the efficiency of the company’s own sourcing department and buying materials through the steel and raw materials importer Oy Telko Ab.

Meanwhile, skilled workers were in the making in the company’s own apprentice department. One of these future professionals was Pekka Käki. He joined Lahden Rautateollisuus at the age of 15, immediately after the war reparations were done with. He describes the apprentice department built during reparation years as bleak. When you entered it on a fall day, all you saw looking in from the door was black—black walls and a black ceiling. The few overhead lamps did little to brighten up the space. “It was so dark you could barely find your own machine,” he says with a laugh.



The last war reparations train about to depart for the Soviet Union.

Lahden Rautateollisuus delivered 1,199 machines to the Soviet Union as war reparations. The list included 340 radial arm crosscut saws, 120 gang saws, 55 mortising machines, 60 single surfacers, 45 rip saws and 170 edgers. An estimated 865 truckloads were needed to transport the war reparations machines.

Fortunately, there was a work lamp at every machine. It provided enough light for working, but when you needed something from the cabinet behind the workstation, you needed to turn the lamp towards the cabinet to see what was there.

Some of the workforce was hired through crash courses organized by the government, but in relation to installations, the company sometimes had to rely on workforce borrowed from other companies like Valmet and Lokomo. Despite the labor and materials shortage and the tight schedule, the war reparations were paid according to schedule. In addition to 1,199 machines, the company delivered auxiliary equipment and, as a subcontractor, iron barge parts to Valko's docks. Every delivery that left the factory of Lahden Rautateollisuus was shipped either by the deadline or before it.

The last truckload of war reparations produced by Lahden Rautateollisuus departed Lahti for Vainikkala on May 30, 1952.

CELEBRATING WORK

The factory held a small function, dubbed Työn juhla (or a celebration of work) to celebrate the end of the reparation deliveries. The guests included Rear Admiral Svante Sundman, chairman of the delegation of the war reparations industry. The speech was given by the company's technical director Pauli Mustakallio.

“When the war ended in 1945, our factory faced an entirely new situation. The production during the war had been different, due to which we needed a change in direction after it. On one hand, we were able to follow an old path in that we had been making machines related to the wood processing industry since before the war. But on the other, we needed to design new machine models, create new work planning and in other respects, change the factory's operations in a way that would allow it to meet the requirements,” said Mustakallio, adding:

“We hope that the machines and equipment we have delivered function well at their destinations, and that they are a credit to our factory and country. It is up to these machines and equipment in particular how we will fare on the markets in the future, markets we hope will still be open to us.”

Lahden Rautateollisuus was one of the most important suppliers of the purchases related to the war reparations. The value of the machines delivered to the Soviet Union pursuant to the war reparations agreement was 2,173,900 war reparation dollars. This equaled 3.1 percent of the entire machine industry's war reparations.

The war reparation deliveries had a significant impact on the development of Lahden Rautateollisuus's operations. The company's technical level improved: it set up a separate work planning department which was responsible for planning and timing production; the machines were arranged to correspond with the changed production; drafts were made piece by piece; and the pricing of contracts was concentrated in one place.

The end of the war reparations did not change the work situation in any major way, because exporting to the Soviet Union continued within the framework of trade agreements. Exports, to the Soviet Union and elsewhere, already accounted for 35–55 percent of sales.

The war reparation deliveries had a significant impact on the development of Lahden Rautateollisuus's operations.

Lahden luotettavia puuntyöstökoneita

PUUNHÖYLÄYSKONE H. 4 1/2

Vankka ja tehokas yleishöylä. Asettaminen nopeata ja kätevää. Toimitetaan joko välivaihtoi-
neen tai sähkömoottorikäyttöisenä.

5 kutteria. Vaihdettavat tasosilitysterät.
Koteloidut hammasvaihteet. Suurin höyläysleveys 250 mm. Suurin höyläyskorkeus 100 mm. Syöttönopeudet 6 — 14 — 22 ja 30 m/min. Voimantarve 30 hv.

Nähtävänä näyttelyosastossa KEVÄT-MESSUILLA



Lahden Rautateollisuus Oy
(LAHTI P.A. Suola 311)

Uusi Suomi 31.3.49.

Raute

— KATKAISUSAHOJA varastosta tai lyhyellä toimitusajalla.

TASAPAINOKATKAISIJOITA
500—800 mm terää varten, uusittu malli.

HALONKATKAISUSAHOJA "SISU"
Lujaa runkoa, joustava kytkin, akseli- ja teräsuojukset.

PYYTÄKÄÄ TARJOUKSIAMME! RAUTE-KONEISIIN VOITTE AINA LUOTTAA.

Lahden Rautateollisuus Oy
(LAHTI P.A. Suola 311)

Uusi Suomi 20.10.49.

Raute

— KATKAISUSAHOJA varastosta tai lyhyellä toimitusajalla.

TASAPAINOKATKAISIJOITA 500—800 mm terää varten, uusittu malli.

Uusi Suomi 11.9.49.



HALONKATKAISUSAHOJA "SISU"
Lujaa runkoa, joustava kytkin, akseli- ja teräsuojukset.

PYYTÄKÄÄ TARJOUKSIAMME! RAUTE on luotettavan koneen tunnus.

Lahden Rautateollisuus Oy
(LAHTI P.A. Suola 311)

Raute

— KATKAISUSAHOJA varastosta tai lyhyellä toimitusajalla.

TASAPAINOKATKAISIJOITA 500—800 mm terää varten, uusittu malli.

Uusi Suomi 9.11.49.



HALONKATKAISUSAHOJA "SISU"
Lujaa runkoa, joustava kytkin, akseli- ja teräsuojukset.

PYYTÄKÄÄ TARJOUKSIAMME! RAUTE on luotettavan koneen tunnus.

Lahden Rautateollisuus Oy
(LAHTI P.A. Suola 311)

Raute's advertisements in the journal Nuori Suomi in the 1940s.

REQUESTS FOR QUOTATIONS FROM THE 1940S

Imatra May 14, 1949

LAHDEN RAUTATEOLLISUUS O/Y
Lahti

I would like to inquire the availability and delivery time and price of a Lahti gang saw with a low base and an 18" yard frame. What kind of devices would accompany it?

Yours faithfully, Vilho Taponen
Imatra Vallinkoskentie

Pietarsaari April 19, 1949

LAHDEN RAUTATEOLLISUUS O/Y
Lahti

I am contacting you in relation to an earlier advertisement in Helsingin Sanomat which mentioned that you have resumed the production of planers. I would be extremely interested in your new model of this machine and would like to request further details on its delivery time, price, etc. An illustrated description if possible.

Yours faithfully,

Höyläimet: K.Tarkkinen
Address. Pietarsaari
Höyrysaha.

Helsinki January 1, 1949
Mariankatu 8

Lahden Rautateollisuus Oy.,
Lahti

Re your advertisement in the newspaper concerning a five-cutter export planer, I kindly request details on its price and delivery time and a possible brochure (prospectus) to be enclosed. Insofar as you may be able to offer wide heavy rotary planers (80—90 mm), I would also request your details concerning them.

Yours faithfully,

S.W. Taskinen

WARTIME CORRESPONDENCE

The department intends to set up a small carpentry shop to facilitate the pastime of the troops in our area and for the production of doors, window panes and furniture.

For this purpose, we would require the following machines and tools: a rotary planer; a single surfacer; a milling machine; a mortising machine; a band saw; and a lathe. Given that our budgetary appropriation does not allow us to procure this many finished machines and because the matter is of utmost urgency, we would request advice from your company on how to best proceed in this matter. Would your company be able to provide the necessary parts for the machines mentioned, for example, which would allow us to assemble and get the machines in working order here. We would be grateful to receive your reply as soon as possible.

Captain Bruno Wenden

12 January, 1944

LAHDEN
RAUTATEOLLISUUS O/Y
Lahti

Please find enclosed the following authorizations for purchasing potatoes: No. 301456, Farmer Niilo Nihtilä, 5,800 kg and No. 301455, Farmer K. Nihtilä 5,000 kg. Re our agreement on the telephone, we request that the potatoes be delivered to our factory as soon as possible.

Yours faithfully,
LAHDEN RAUTATEOLLISUUS O/Y
Enclosed: 2 purchasing authorizations.

S.M.K., Lahti,
P/SJ
October 9, 1943

Given that on several occasions this fall there have been so many boxes of shells at our factory that there has not been enough room for them under one roof, due to which they have instead gotten wet outside in the yard, which has caused a variety of troubles, we are forced to build a shelter for them. However, since we have been unable to obtain roofing felt and nails for the construction, we respectfully request that we be granted permission to buy the following from the Defense Forces' warehouse:

320 m² of roofing felt
30 kg of 2.5" wire nails
30 kg of 5" wire nails

Given how important it is for the boxes in question to remain dry, we request that our application be approved.

Yours faithfully,
LAHDEN RAUTATEOLLISUUS O/Y

Headquarters
Department of
War Economy
Industrial office.
HELSINKI

155 artillery shell casing Cu ring material. In response to Lieutenant Tirri's inquiry, we would like to inform you that the consumption of Cu bar per shell is as follows:

Gross consumption 600 gr Weight of bar = 505 gr
Length of bar = 395 mm
1 piece of finished ring, weighed weight = 345 gr

Yours faithfully,
LAHDEN RAUTATEOLLISUUS O/Y

Headquarters
Department of
War Economy
Raw materials office
HELSINKI



PROFILE

A MAN OF PRINCIPLE

Aarne (aged 17) began training at our factory today, Henrik Schwartzberg wrote to his brother Juho in a letter dated July 12, 1926. Almost another decade would pass after this training period before Aarne Mustakallio (1909–1970), who had a master’s degree in engineering and would eventually come to hold the Finnish honorary title of “vuorineuvos,” left the service of the central cooperative society Hankkija to start working at the office of his father’s business.

As Henrik Schwartzberg’s memory began to fail, Aarne listened in to his father’s phone calls and customer orders from another phone. This ensured that work was taken care of, and customer relationships retained, but it also served as good coaching for the company’s management.

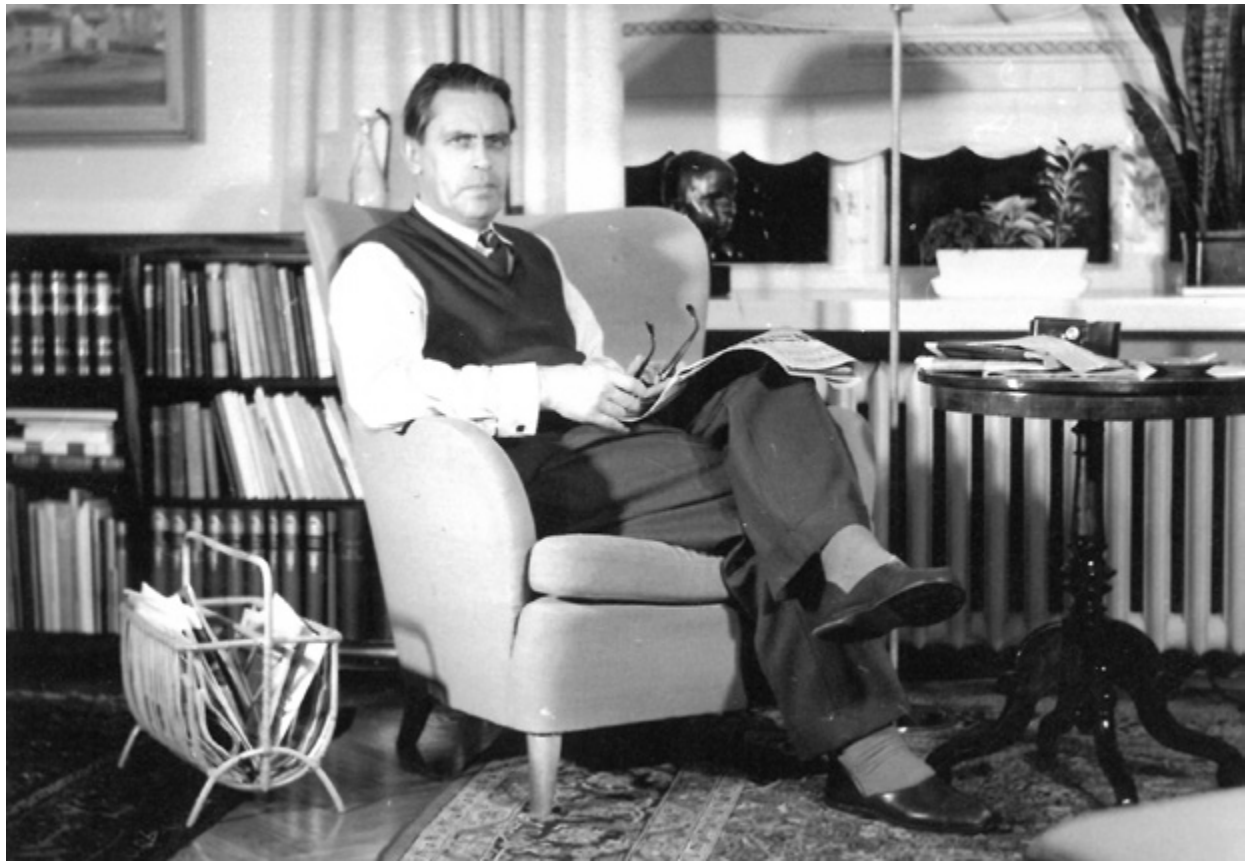
When Schwartzberg retired in 1938, Aarne took over as the company’s governor and managing director. He was only 29. As a technically gifted person, Aarne developed Lahden Rautateollisuus from the standpoint of both technology and business. It was under his leadership that the company became a successful export business.

Businesslike and strict, but fair. Respected by clients due to his businesslike manner and expertise. This is how Mustakallio could be characterized in his capacity as Raute’s managing director. His long term as the managing director entailed a great many things, including the years of war, war reparations, trade with the Soviet Union and making inroads to new market areas.

“I remember seeing off dad at a train station with my mother as he was leaving for Moscow. Forklifts were loading large wooden crates onto the freight car, and I was told that they were loading the

Aarne Mustakallio

Lahden Rautateollisuus Oy’s employee in 1934–1938; governor, managing director in 1938–1970; and chair of its Board of Directors in 1947–1960. Managing director of Mustakallio Oy in 1943–1960; technical director of the delegation of the war reparations industry in 1945–1946; managing director of Sopenkorpi Oy in 1945–1960; managing director of Lahden Vaaka Oy in 1952–1960; managing director of Sopekaluste Oy in 1954–1960.



documents and drawings related to a deal. I was a teenager at the time, and it stuck in my mind quite vividly. It wasn't until decades later that I realized that the trip involved the negotiations for the major Bratsk deal in the late 1970s," says Mustakallio's daughter Sinikka Mustakallio, adding that you never knew in advance how long such business trips would take. You were asked to be there on a specific date, but sometimes the Soviets would leave the Finns to sit in a hotel for days on end before the negotiations started. In other words, trade with the Soviet Union was not always easy.

Family was important to Aarne. Summers with the family were spent boating on Vesijärvi and Lake Päijänne, winters were spent skiing. Sinikka has a vivid recollection of her father donning the blue jacket and cap of the Lahden Hiihtoseura sports club at the 1958 FIS Nordic Ski World Championship races, which he was organizing in his capacity as the club's vice president. Her father was also the

In 1945–1946, Aarne Mustakallio worked as the technical director of the delegation of the war reparations industry (Sotakorvausteollisuuden valtuuskunta) in addition to managing the factory.

This picture was taken in the 1960s.

Aarne was
a firm man of
principle, Pauli
was the more
outgoing one.

person in the family to whom everyone turned when they wanted information about something. His usual reply was: “Let's look it up in the encyclopedia.” This happened and new things and ideas were explored together.

“What my father taught me about shouldering responsibility above all was that you must ‘keep calm and carry on’ when times are difficult and that you must also be able to make decisions that are not nice or easy.”

Like his brother, Pauli Mustakallio, Aarne was actively involved in Lahti's local politics as a member of the local government and city council, for example. He acted as the chair of the Board of a preparatory vocational school for boys; a member of the assessment committee; an inspector of the town board and archive; the chair of the Board of the general vocational school; and a member of the industrialization committee. He was also a Board member of the cooperative society Metex, the Employers' Association of the Finnish Metal Industries, and the telephone company Lahden Keskinäinen Puhelinyhdistys. In addition, he chaired the Boards of Lahden Vaaka Oy, Sopenkorpi Oy and Oy Plastex Ab, and was deputy chairman of the Board of the Association of Finnish Metal and Engineering Industries.

A MAN OF PRINCIPLE

As a team, Aarne and Pauli Mustakallio worked well together and complemented each other. Aarne was a firm man of principle, Pauli was the more outgoing one. In the 1940s and 1950s, the brothers developed the factory into a family-owned group of companies made up of Lahden Vaaka Oy, Sopenkorpi Oy and Mustakallio Oy, in addition to Lahden Rautateollisuus. Each company had its own governance, but the same owners and managers.

When the other group companies merged with the parent company in 1959, Mustakallio Oy, established in 1943 for the war reparations orders, closed down. Aarne Mustakallio worked as the company's managing director until his death in 1970. He died aged 61. The youngest of the brothers, Heikki Mustakallio, was appointed Aarne's successor. Aarne Mustakallio's family included his wife Ulla Mustakallio (née Vuorimies) and children, Kai, Risto, Sinikka and Marja.

The President of the Republic of Finland granted Aarne Mustakallio the honorary title of *vuorineuvos* in 1969.



Pauli Mustakallio

Mechanical engineer and technical director of Lahden Rautateollisuus Oy in 1933–1937 and 1937–1963, respectively.

Board member of Lahden Vaaka Oy and Sopenkorpi Oy until 1963.

PROFILE

BRIDGE-BUILDER

The oldest brother Pauli Mustakallio (1905–1963), director and later holder of the Finnish honorary title yli-insinööri, joined Lahden Rautateollisuus in 1933, first working as a mechanical engineer and from 1937, as its technical director. After the war, Pauli made a lengthy trip to the United States, touring the country and getting to know its economic life.

Like his brother, Aarne, he held numerous positions of trust in Lahti, including in the crafts and industrial association of Lahti (Lahden käsi- ja teollisuustyöyhdistys). Being a sociable person and counting community affairs among his interests, Pauli was a member of several associations like the Rotary Club and was also a Board member of the Employers' Association of the Finnish Metal Industries.

His contribution to Lahti's municipal affairs was significant. Among other things, he chaired the city council and was a member of the town board and several of its committees. He also chaired the electricity committee and was the chair of the Board of the Lahti chamber of commerce and a Board member of the Employers' Association of the Finnish Metal Industries, a member of the Board and working committee of the Finland Chamber of Commerce, and an honorary member of the crafts and industrial association of Lahti. He was also a Board member of Lahden Vaaka Oy, Sopenkorpi Oy, Loviisan Rautatie Oy and Oy Tesla Ab, and acted as the overseer of the Lahti branch of Kansallis-Osake-Pankki.

In politics, Pauli Mustakallio was above all a bridge-builder whenever a situation seemed difficult. In the company, he had a reputation as a capable and skillful tradesman. He was universally liked and respected in both negotiations and among employees and was someone to whom people felt they could always turn.

The President of the Republic of Finland granted Pauli Mustakallio the honorary title of yli-insinööri in 1955. Pauli was work-oriented



Pauli and Anna Mustakallio.

and enjoyed his work in his father's company, but his career was cut short when he died, aged only 57, from injuries sustained in a car accident in 1963. The Pauli Mustakallio scholarship fund of the Lahti technical institute (Lahden teknillinen oppilaitos) was established in his memory to promote technical education.

“He was a big-hearted person with a sunny disposition, and he found the time for a surprising number of activities. Our hometown has indeed lost an exemplary representative of the honorable traditions of the old Lahti,” said Pastor Partanen in his eulogy.

Pauli Mustakallio's family included his wife Anna (née Gummerus) and children, Riitta and Kari. In his free time, he took his family on trips along Vesijärvi and Lake Päijänne in his mahogany boat. During the summers, Pauli spent much of his time at his summer place in Paimela, where he grew roses and studied plants.



In addition to astronomy, Pauli Mustakallio loved boating. With his family, he made overnight boating trips on his wooden boat along Vesijärvi and Lake Päijänne. Pauli Mustakallio (left) sitting next to his youngest brother, Heikki.



Enonkärki, which then served as a summer place for the office workers and retirees, was around five kilometers away by water from the Lahti marina. Enonkärki was renovated partly on the basis of the collective effort of volunteers. The island's spring cleaning also relied on volunteers. Visitors to the island were ferried there and back by Raute's own boat. In the summer, Enonkärki was also used for wining and dining visitors. Trips to the island became an annual event that lasted for decades.

STORIES FROM RAUTE

WORK WROUGHT IN IRON

The personnel's stories paint a good picture of what it was like to work in the young company.

Employment relationships were lengthy and often lasted for decades, the longest ones more than half a century. When hiring new people, their children were given priority, and in many cases, the company provided employment for both father and sons. Only a few women worked for the young company, but their numbers grew gradually.

New people were also hired at the recommendation of other employees. It was indeed quite ordinary for a young person who had just finished school to first ask about a possible job from someone they knew to be working at Rautateollisuus, and for this person to then pass on the question to their supervisor.

"Fitter Yrjö Heinonen had laid out the groundwork for a job for me at Vaaka and told me to come to the gate on June 1st. A stream of people passed through the gate, and at the gatekeeper's advice I was keeping an eye out for a tall man in a light-colored coat. When I saw a guy fitting the description walk in through the gate, I went over and politely told him that I was looking for a job and had been advised to ask for one from him. The guy was chief foreman Artturi Nikko. He looked at me and, without much in the way of questions, told me to come to work the next morning," says Tapio Strandberg,

For the duration
of the market
day held every
September, the
factory stood still
so that everyone
had a chance to
go the market.

looking back on the day when he was hired at the factory gate in 1959 to hone scale pans and blades at Lahden Vaaka.

Supervisors were respected and addressed respectfully. A title—such as engineer, director, or foreman—was always added to a name. In the earliest years, you also stood up when a supervisor walked into a room and young women even curtsied to supervisors.

The factory’s working hours began at 6:30 a.m. and continued until 6 p.m. There was a 30-minute break in the morning and an hour’s break in the afternoon for lunch. The office staff did not arrive to work until eight in the morning.

Compliance with working hours was monitored with timecards. While supervisors were willing to turn a blind eye to being four minutes late, the fifth minute would dock 30 minutes’ worth of wages from your pay. At the end of each day, employees would fill in hour cards, detailing their jobs for the day. For the duration of the market day held every September, the factory stood still so that everyone had a chance to go the market.

In 1921–1923, Lahden Rautateollisuus acquired buildings to house its personnel. These buildings were located in the current Lahti district of Paavola. Kyllikki Hänninen, who began working in the office of Huonekalutehdas Sopenkorpi Oy in 1947, recalls that, at the time, many employees lived in small one-room apartments with a stove and bought waste wood from Sopenkorpi to heat them. One such small apartment could house many working people.

A VILLA FOR OFFICE WORKERS

In the 1940s and 1950s, the factory workers and office workers did not really socialize with each other, and the bone of contention was often the villa in Enonkärki, reserved for the use of the office workers’ club. The canteen was another issue that for years stood in the way of harmonious relations. The office workers had a canteen of their own, and the factory workers theirs.

“Since the company’s personnel has grown considerably, and since it is no longer possible for people who do not have their own summer villa to get to the countryside for recreation on Sundays and in the evenings and during vacations, the company has for quite some time now been looking for a place that could serve as the office workers’ shared recreational place on Sundays and weekends. Now that the estate owner Borop is willing to sell the villa on



The design department.
Design engineer Jorma Kuuva
can be seen resting his chin on
his hand.

Enonsaari for a price of FIM 200,000, the Board has unanimously decided to buy it for the aforementioned purpose, having found it suitable for said purpose, given that it is in a suitable place and is of a suitable size. Engineer A. Mustakallio was authorized to conclude the transaction on behalf of the company.” Henrik Schwartzberg’s wife Hanna and Aarne Mustakallio made the above decision on December 23, 1943, on behalf of the Board of Directors.

Enonkärki, which then served as a summer place for the office workers and retirees, was around five kilometers away by water from the Lahti marina. Visitors to the island and back were transported by the company’s own boat.

For decades, the office workers’ club saw to the maintenance of the villa and its grounds, assisted by the company. The villa was in active recreational use until the early 1970s. A housekeeper and a host, designated by the club, lived on the island for the summer months. In addition to various shared events, the employees used the villa as a place in which to spend weekends and vacations.

In exceptional circumstances, the company sought to assist its personnel in a variety of ways, including in the procurement of work clothes.

The Enonsaari properties were renovated in the early 1980s. When the renovation was complete, its use as a summer place changed. It was now mainly intended for the company’s visitors and events held for the company’s personnel and its veterans’ club. A veterans’ club had been established at Lahden Rautateollisuus on January 7, 1964, under the leadership of Aarne Mustakallio. Membership required an employment relationship of at least 20 years with Lahden Rautateollisuus Oy. A veteran’s pin designed by Major Soini Talaskivi was also given to the club’s members. The veterans’ club has remained active to this day.

THE PERSONNEL SERVICES OFFICE SERVED AS A BANK AND CARETAKER

While the level of income offered by Lahden Rautateollisuus was not the best in Lahti, other factors outweighed this. It was common knowledge that the company always took care of its own.

“Even if you would have been paid a few marks more someplace else, it made no difference. You could not picture a better workplace atmosphere than the one at Raute,” says Kirsti Veneskari, who joined the drafting office in 1944, in an old interview.

In the 1940s, wages were paid gross, without tax withholding, and everyone needed to pay their taxes themselves. If you failed to do so, the taxes were distrained, and the distraint officer was indeed a familiar sight at the personnel services office of Lahden Rautateollisuus.

“Taxes, life insurance policies, electricity bills and other regular expenses are necessary evils for us modern people—and just as necessary as their executor is the personnel services office of an industrial facility. This we all know already. What is new and intriguing, however, is the factory’s library. And we will see something even stranger and newer if we browse its catalog. ‘Metallurgy textbook’. Now that’s something that a layman only understands the latter half of. But even skilled workers need education, and the library is intended precisely for them.

Independent studying supported by the factory is nothing new to its workers. The five study clubs, all about to conclude a course, are good testimony to this. Technical drawing and drawing skills, leadership and work psychology, to mention but a few examples,



Women working for Raute, Vaaka or Sope about to embark on a trip. The picture was taken in front of the head office.

are the subject of study here,” was how the factory’s working conditions were described in the newspaper Lahti in 1949.

The personnel services office operated from the 1950s until the 1970s, and was Maija-Liisa Vainio’s realm. In the minds of many Raute employees, Vainio was the second most important person at Raute, right after managing director Mustakallio. Vainio took care of the personnel’s affairs in relation to sick leave and sick pay, money lending issues and debts. The personnel services office paid better interest on savings than a bank and correspondingly, loaned money with lower interest than the banks. Bills could be left at the office for payment. The office also collected any unpaid alimony. When withholding taxes later began to be withheld directly from wages, you still needed to pay parish taxes yourself. *“If you were ill, in trouble or short on funds and had no way to make it, the personnel services office helped,”* says Tapio Strandberg, looking back. Vainio took personal interest in the

When the men were out of town on fitting or installation jobs, Maija-Liisa took care of Mother's Day gifts and birthday roses for their spouses.

concerns of Raute employees, and usually found an effective solution for them. For example, when a shop hand had to wear galoshes on account of not being able to find size 50 shoes from stores, Vainio hired a shoemaker to make him shoes that fit.

Until 1968, wages were paid cash in hand. Two people always bagged the payroll at the office on the day before wage payments. On the payment day, one person from each department fetched the pay packets and distributed them in their own department. The wages did not need to be signed off on, because everyone being present proved that the wages had been paid.

THE PERSONNEL WERE LOOKED AFTER

In exceptional circumstances, the company sought to assist its personnel in a variety of ways, including in the procurement of work clothes.

After the war, many things were in short supply, including firewood. The company arranged transportation and an opportunity for those who wanted to buy firewood to obtain some, but the employees needed to chop the wood themselves. If you chopped four cubic meters of firewood, one cubic meter was given to the company's war widows and the rest you could buy for yourself. There was also a dire shortage of bicycle tires, and not enough to go around from those procured by the company. Vainio examined the length of different employees' journeys to work with the help of a map and the shop steward, and the tires were distributed on this basis.

When the men were out of town on fitting or installation jobs, Maija-Liisa took care of Mother's Day gifts and birthday roses for their spouses. Heikki Mustakallio once asked her to visit a family grave—at the time, family businesses also took care of family affairs—and realizing that she was about to go home for the day instead, her supervisor threatened to fire her. Vainio was fired, but she was also back at work the very next day. In those days, no clear distinctions were made in terms of what a job description entailed or did not entail. You did what you were told to do.

While the top management adopted a very strict stance on alcohol, many of the bosses took a softer line and protected the alcoholics, because they wanted to remain on good terms with their workers. Smoking, on the other hand, was permitted everywhere.



The women of the payroll office.

People smoked in the offices, next to the machines and in the canteen. No one talked about the dangers of smoking or secondhand smoke.

A major change in working life took place in 1968, when the workweek became a five-day one and weekly working hours gradually reduced from 45 to 40; when the machine shops adopted the metric system in lieu of inches; and when the payment of wages moved from the payroll desk in the head office lobby to the bank. However, for some Raute employees, going to the bank was difficult, while others were opposed to the wages being paid to a bank purely as a matter of principle. The dispute was finally solved when it was agreed that, while all wages would be paid to a bank, a bank clerk would visit Raute after each payment and hand over the wages in cash to those who preferred to receive their wages as no-nonsense banknotes.



Frame saw parts can be seen in the foreground of this photo, depicting a row of filers.

A major change in working life took place in 1968, when the workweek became a five-day one and weekly working hours gradually reduced from 45 to 40; when the machine shops adopted the metric system in lieu of inches; and when the payment of wages moved from the payroll desk in the head office lobby to the bank.



Factory folk.

Until 1968, wages were paid cash in hand. Two people always bagged the payroll at the office on the day before wage payments. On the payment day, one person from each department fetched the pay packets and distributed them in their own department. The wages did not need to be signed off on, because everyone being present proved that the wages had been paid.

A large group of people, including men and women of various ages, are posed in front of a long, two-story wooden building with a corrugated metal roof. The people are dressed in mid-20th-century clothing, such as suits, dresses, and sweaters. The scene is set outdoors on a dirt or gravel surface. The entire image is overlaid with a semi-transparent olive-green filter.

DEVELOPMENT OF DOMESTIC TRADE AND TRADE WITH THE SOVIET UNION

1954 Sopekaluste Oy is established to market furniture.

1960s Lahden Rautateollisuus becomes the biggest employer in Lahti. An ANRA brand blockboard line is the decade's best-selling product.

1960 Lahden Vaaka Oy, Sopenkorpi Oy and Sopekaluste Oy are merged with Lahden Rautateollisuus.

Raute concludes a contract for the delivery of a plywood mill to Bratsk, Soviet Union. The deal is the biggest in the company's history and saves its operations.

Raute's Nastola factory for wood processing machines is completed.

1970s Production line thinking is expanded to the manufacture of particle board in addition to plywood.

1953

1963 A new office building is completed at Vesijärvenkatu 23.

Technical director, yli-insinööri Pauli Mustakallio dies in a car accident.

1968 The company makes the first prototype of a continuous veneer turning-drying-cutting-sorting line for Pellos Oy's plywood mill in Ristiina.

1970 Aarne Mustakallio dies and is succeeded as managing director by his younger brother Heikki Mustakallio.

The Bratsk plywood mill is completed.

The production of the company's own hydraulic wood panel presses begins in Nastola. They are an instant success.

1971 The first complete particle board line is delivered to the furniture maker Isku Oy.

1974 A sales office is established in Portland in the United States.

1975 Lahden Rautateollisuus Oy acquires Enwe Oy and a majority in Infor Oy's shares.

1976 The company's foundry closes down.

1977 Raute makes an agreement on the delivery of a particle board mill to Beeskow, East Germany, in cooperation with

1994

Rauma-Repola. The deal eases the company's financial situation.

1979 A sales office is established in Quito, Ecuador.

1980 The first LVL line is delivered to Metsäliiton Teollisuus.

1988 An office building is completed in Nastola.

1994 The first line for softwood plywood is completed for Pellos in Finland.



STORIES FROM RAUTE

GROWTH OF EXPORTS BEGINS WITH THE SOVIET UNION

From the outset, Lahden Rautateollisuus Oy also had its sights set on international markets. The company exported products to Russia and had consignment stocks in St. Petersburg and Moscow as early as 1913. At the time, the exports to Russia included sawmilling lines for the sawmill industry, because the army needed construction materials for new barracks. During World War I, the company sold iron beds, lathes for artillery shells and field kitchens to the Russian army.

Large-scale exporting to the Soviet Union began with the war reparations. In addition to plywood machines, the company delivered a substantial number of planers, trimming facilities for sawn wood, joinery machine lines, and glulam beam mills to the country.

GOOD RELATIONS OPENED DOORS

Thanks to the war reparations deliveries, the company could rely on existing good relations and clients in the country. Trade relations were a particularly valuable asset, given that the manner in which the Soviet Union engaged in trade differed from that of other countries—whereas in Europe, you made deals directly with your client, the only opportunity for a company exporting products to the Soviet Union to get in touch with a local buyer was through one of the foreign trade

The machines being shipped all over the world were loaded directly onto trains. A spur track was built to both the Lahti and Nastola factory grounds.



Plywood production.

organizations which controlled the monopoly on foreign trade in the Soviet Union. The foreign trade organizations purchased the products, including entire factories and plants, from the partners they preferred. The address list for deliveries at the end of a contract appendix was virtually the only thing representing the end clients.

What helped Lahden Rautateollisuus in this trade was the good cooperation it had had with the Soviet Union for decades—the company had always made its deliveries on time, and its machines represented the cutting edge of their industry, given that the Russians were sticklers for quality. These are some of the reasons why representatives of the foreign trade organizations forged long-term contracts with first Aarne Mustakallio and later Heikki Mustakallio, resulting in massive deliveries to the country.

What saved the company was a deal made in early 1968 on the delivery of a plywood mill to Bratsk, Siberia.

THE BRATSK DEAL SAVED THE COMPANY

In the 1960s, more than half of the production of Lahden Rautateollisuus was exported, and half of this was exported to the east. Midway through the decade, the company was negotiating several deals with Soviet partners, but they were progressing more slowly than the company had anticipated. This resulted in a steep drop in its net sales. While the net sales in the financial period which ended in 1967 had been more than FIM 30 million, the next year they were only slightly more than FIM 10 million. The company was unable to pay its bills, was running out of money and had to start laying people off to keep afloat.

What saved it was a deal made in early 1968 on the delivery of a plywood mill to Bratsk, Siberia. The order for the gigantic plywood mill was the biggest individual order for the company that decade and shifted Lahden Rautateollisuus back onto a growth track.

The price tag for the state-of-the-art Bratsk mill was SUR 72 million, which translated into FIM 432 million, according to the 1979 exchange rate. When ready, the mill provided jobs for 1,000 women and 400 men, and its annual production capacity was more than 200,000 cubic meters. Thanks to the order, the following years were marked by hard work and strong growth.

“Well, one cannot give any exact figures yet on the significance of the deal, but it’s big. The deliveries won’t begin until the middle of 1969 and will go on until the end of 1970. A three-year contract, in essence,” said managing director Aarne Mustakallio, commenting on the deal in the newspaper Kansan Uutiset.

The Bratsk mill delivery would not have been secured without the investments in product development made in the previous years.

LINE AUTOMATION BEGINS

Back in the 1960s, plywood production was still slow, as every stage of the work was manual. Because of this, the work was time-consuming and tied up labor. Lahden Rautateollisuus wanted to speed up the process, so the design department began to design the automation of the work phases.

The first phase which came to include intelligence was veneer lathing. The block centering device developed by design engineer Jorma Kuuva lifted logs and positioned them mechanically in the right



place. The machine saved the work of two men and made the work considerably faster.

In 1966, the company produced its first prototype of a continuous lathing-drying-cutting-sorting line for veneer. According to Raimo Seppälä, who worked in the development team, the line’s development represented an enormous technical leap for Rautateollisuus. According to a brochure, *the line required minimum human resources while achieving savings in the use of the raw material.*

The continuous veneer lathing-drying-cutting-sorting line was originally intended to be delivered to Schauman Wood’s mill in Savonlinna, Finland, but in the end, the company delivered only a continuous lathing and drying line there. It was on the basis of this line that Lahden Rautateollisuus won the Bratsk deal.

“The Savonlinna line was an important sales reference for us. It represented the best in its business and the Russians always

Managing director Aarne Mustakallio presenting the company.

The photo was taken in front of the head office at Vesijärvenkatu in the 1960s.

After the Pellos delivery, the lines were sold to nearly all of Finland’s small plywood mills.

wanted the best. They came to see the line and ordered a similar, only bigger, one from us. While a mill normally has one or two lathing lines, 16 of them were delivered to Bratsk,” says Reijo Kaunisto, who was then responsible for domestic sales.

The company finally delivered the first complete continuous lathing-drying-cutting and sorting line for veneer a couple of years later to the mill owned by vuorineuvos (Finnish honorary title) Aarnio in Pellos, Ristiina. It was another good sales reference. After the Pellos delivery, the lines were sold to nearly all of Finland’s small plywood mills.

“The result of this development is that Lahden Rautateollisuus nowadays produces, in addition to individual wood processing machines, an increasing number of entire production lines and facilities for the wood panel industry, in which the production is based on fairly advanced automation. Of the most important deliveries currently underway, one could mention the continuous veneer lathing, drying and cutting lines to Oy Wilh. Schauman Ab (two lines), Savo Oy, and to Heinolan Faneritehdas Fachariassen & Co. At the turn of the year, the company will be shipping two lathing and cutting lines to Poland. Two mill complete mill units will be delivered to Hencovce and Hodon in Czechoslovakia,” wrote the newspaper Etelä-Suomen Sanomat in December 1968.

NEW FACTORY TO NASTOLA

The scale of the Bratsk order required the company to expand its welding department so that it would be able to deliver the order on time. Given that the industrial block in the center of Lahti had already been built to the hilt, and that the town’s decision makers at the time did not have a favorable view of a factory in the middle of Lahti, expansion there was no longer possible.

Fortunately, a suitable lot had already been found in Nastola, some twenty kilometers from Lahti, and the construction of a new factory was already underway. The advantages of the industrial area, which had been left vacant by the Pelkonen Sawmill and bought from director Paavo Pelkonen, were the existing spur track there from the Uusikylä station and the sandy soil suitable for the founding of heavy machine tools, both important for Lahden Rautateollisuus.

The Nastola factory began operations in the summer of 1968 with a personnel of around 100, right on time for the deliveries to the Bratsk

AN IN-HOUSE APPRENTICE SHOP TRAINED PROFESSIONALS

An old section of the Lahden Rautateollisuus factory, built when Finland was still a part of Russia, housed the company's separate apprentice shop, in which novices were trained to become professionals.

Foreman Pekka Käksi, who retired from Raute in 2014, first joined the company in the summer of 1965. Aged 15 at the time, Käksi had completed his vocational degree in metal turning the previous day. On the first day of June, he and four of his friends from school waited at the factory gate for engineer Metsiö, who led them to the forge shop.

Following a brief tour, the boys were taken to the tools department, where they were given a vernier caliper, tape measure and a thread chart resembling a slide rule. Each of them was expected to buy these tools for themselves at a reasonable price. "If you stay with us for a longer time, you will be paid a small annual compensation for the tools," said Juhani Rautiainen, who was responsible for inducting the youngsters to their tasks. In addition to the tools, the boys were given ten washers hung on a big safety pin which they used to pick up the rest of the tools they needed every morning. Each washer would be handed back when a tool was returned at the end of a day.

An older turner showed a pile of metal to Käksi that needed to be worked into the shafts of dryer blocks. "Start cutting these with the lathe and make bevel angles, 500 of them to begin with," he said by way of instruction.

Käksi says that the work carried out in the apprentice shop was not too demanding. Mostly, the apprentices turned washers and connectors. "The most important thing was to learn how to use the machines, and you had to start somewhere to be able to climb up the ladder."

Pekka Käksi was paid FIM 1.05 an hour. His wages for two weeks amounted to FIM 84.

After enrolling in an engineering school, Käksi always returned to Raute during his school vacations, first as a turner, then as an assistant foreman and finally as foreman of the installation unit. His career, which began in the apprentice shop, ultimately lasted more than 20 years.

In the early 1960s, Lahti had become the center of Southern Finland's metal industry. The metal industry accounted for more than a fifth of the town's industrial sector and provided employment for more than 15,000 Lahti residents.

“Take blank checks from the cash desk and go to Nastola to buy as many apartments as you can.”

mill. Initially, the company built two industrial halls with a combined volume of 37,600 cubic meters and a hall for heavy presses in Nastola. The next phase comprised the construction of a staff building with its locker rooms and canteen for the employees.

In addition to the new factory, the company needed more employees. This was easier said than done. Between 1960 and 1970, the number of jobs in the industrial sector increased by nearly 2,000 in Nastola. Finding experienced workforce for factories was difficult in the best of circumstances, and when the number of required laborers suddenly exploded, finding suitable workforce became all but impossible.

Like many other major companies in Nastola, Lahden Rautateollisuus was enlisting workers for the new factory from across Kainuu and Joensuu. But the problems didn't end there. When the company finally managed to recruit people, it could not find housing for them. Veijo Kauppinen, who was responsible for the deliveries to the Soviet Union, remembers one morning when the then managing director Heikki Mustakallio said: *“Take blank checks from the cash desk and go to Nastola to buy as many apartments as you can”*. Kauppinen bought six of them.

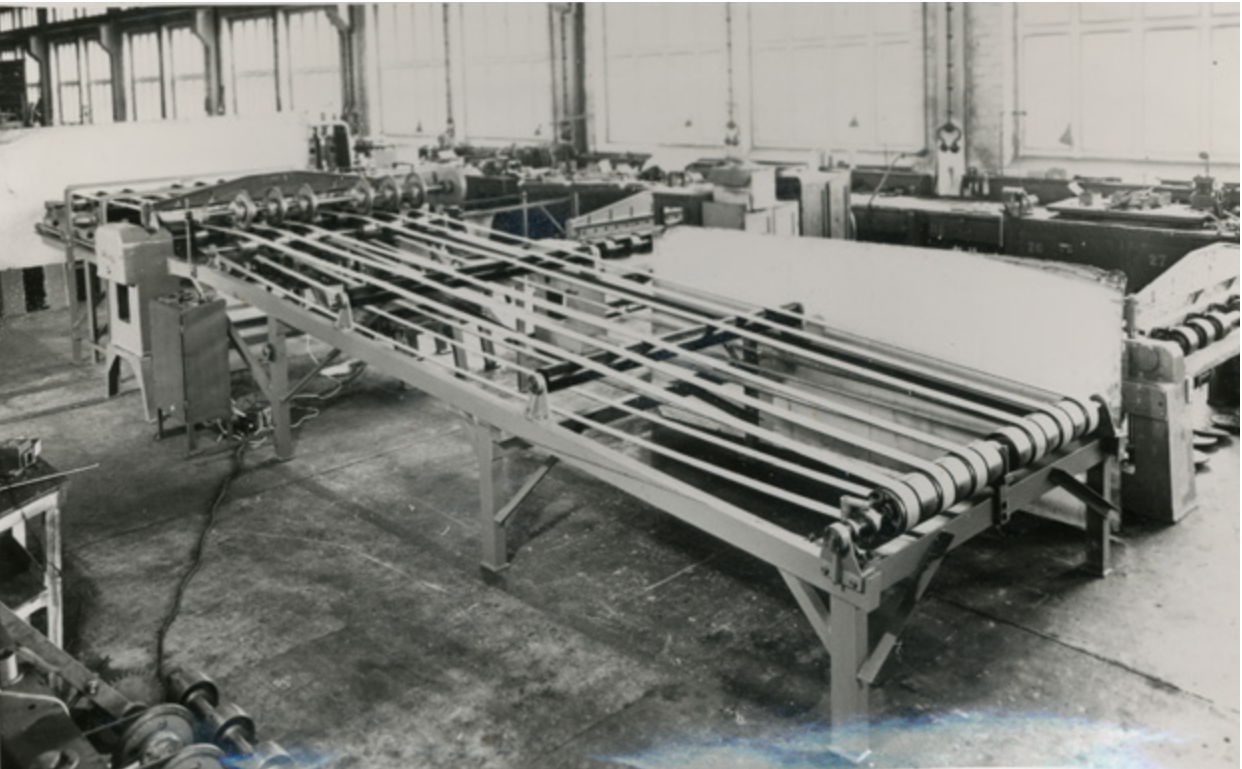
Like many other companies in the industrial sector, Lahden Rautateollisuus later had apartment buildings constructed to serve as company housing.

NEW PROFESSION

During the Bratsk deliveries, the machines' quality was controlled by acceptance inspectors sent to the factory from the Soviet Union. They followed the machines' production daily and ensured that the agreed quality criteria were met. The inspectors and their families lived in Lahti and were replaced at suitable intervals.

The acceptance inspectors played an important role. In practice, they either gave the deliveries the go-ahead or refused it. Some of the inspectors were stricter and more easily offended than others. An agreement nevertheless needed to be reached, and this was usually achieved by appealing to the inspectors' common sense.

Veijo Kauppinen told his people not to discuss sensitive matters or criticize the Soviets when the inspectors were present. He tested one of the acceptance inspectors in a variety of ways and was almost convinced that the inspector did not understand Finnish, until seeing



Veneer cutting line.

him off at the train station. *“I’m a Karelia boy myself, by the way,”* said the inspector in plain Finnish as he was boarding the train.

Besides the quality requirements, the sanctions for any delays were harsh, and keeping up with the schedules was a constant issue. Kauppinen remembers a time when the goods, despite the Midsummer festivities in Finland, had to be packed in the first-rate transport crates made from wood with as few knots as possible. Kauppinen coaxed the packaging crew to remain at work by promising them a Midsummer sauna and a proper spread of food and drink. The crew took him up on the offer and completed the work in a team spirit, rapidly and carefully. On other occasions, the schedule got so tight that the painters were put on board the train with their brushes and cans of paint so that they could finish off painting the machines before disembarking from the train immediately before it reached the border between the countries.

Fun fact: the machines delivered to the Soviet Union were always painted light green instead of the Raute blue. At the factory, they were called cabbage worms.



At a trade fair in Moscow in January 1970. Raute's interpreter (on the left) and the company's managing director Aarne Mustakallio.

To this day, the “Ilim Bratsk DOK” plywood mill is Russia’s largest producer of softwood plywood, and the deal, when counted in the number of lathe lines delivered to a single mill, remains the biggest in Raute’s history.

IN-HOUSE PRESS PRODUCTION PAVED THE WAY TO NEW MARKETS

At the same time as exports to the Soviet Union were booming, Lahden Rautateollisuus was doing increasingly well on the domestic front. What helped it capture the Finnish market was the production of hydraulic plywood presses. Thanks to its own press production, the company was able to deliver entire factories, the key machines of

which it produced itself. Up to this point, the presses for the factory deliveries had been purchased from Germany.

While the press factory was still being designed, technical director Harri Säkäjärvi and production manager Veijo Kauppinen traveled around Europe, visiting companies that manufactured such presses and collecting, among other things, a copious amount of information relevant for starting the production in terms of two critical structural parts—the frame and heated pads. How to relieve the frames’ welding stresses to prevent fatigue failure was something of a headache, but a solution for this was found as well.

“The stresses created during welding are traditionally relieved by heating a piece in an oven, but in this case, the ovens would have been enormous, and they would have taken up a lot of space. So we needed to think of something else,” says Kauppinen.

The solution was also found close by. The Lahti-based welding company Kemppi customized a method for Rautateollisuus which came to be called ‘local anesthesia’ by Kauppinen and Säkäjärvi. In it, heating elements wrapped in mineral wool and controlled with purpose-built converters were placed in the corners of the presser frames. The method was inexpensive, and above all, it did not necessitate enormous heating furnaces.

When the company began producing its own hydraulic wood panel pressers in Nastola in 1970, they became an instant best-seller. During the very first year of production, pressers were delivered to countries like Yugoslavia, Czechoslovakia, Hungary, Ecuador, Brazil and Peru, in addition to Finland and the Soviet Union.

Their production also resulted in innovations such as a presser dryer, which enhanced the drying of the veneer with less energy.

EXPANSION OF PRODUCTION-LINE THINKING

In the 1970s, the production-line thinking expanded to the production of particle board in addition to plywood. Lahden Rautateollisuus delivered its first complete particle board line to the Lahti-based furniture maker Isku Oy in 1971.

“Raute’s particle board lines allow you to achieve the following benefits: The amount of the chips in the surface and middle layers can be adjusted according to the board’s thickness and properties, and the fineness of the chips in the surface layer can be increased



Planing machines being installed.

so that the board achieves the desired smoothness in addition to the desired properties, which is economical in terms of the lamination and finish. The chips in the surface and middle layers are also in the most homogenous form possible, which results in even gluing and forming. Thanks to these features, one can minimize the use of glue and keep the board's properties evenly distributed. The method is also useful when the quality, form and ratios of the raw material vary," was how the company advertised its first particle board lines in domestic industry magazines in 1970.

The production of the particle board lines also relied on the competence of Lahden Vaaka. Lahden Rautateollisuus made the machines, while Lahden Vaaka manufactured the production and dosing equipment for the glue mixture and the chip feeders.

Technical director
Harri Säkjärvi,
who had negotiated
the deal, proposed
cooperation with
the company's
toughest
competitor,
Rauma-Repola.

The decade's most important deal on a particle board factory was made in 1977 and concerned a factory to be delivered to Beskow, East Germany. The deal was technically demanding and so big that Lahden Rautateollisuus would not have been able to take care of it alone. The premise for the design and production was a daily capacity amounting to 600 cubic meters of particle board, which had to meet strict quality requirements. Extensive production and energy-efficiency requirements had also been set for the production facility.

Technical director Harri Säkjärvi, who had negotiated the deal on behalf of Rautateollisuus, therefore proposed cooperation to the company's toughest competitor, Rauma-Repola. This was unprecedented but proved to serve the interests of both companies. Thanks to the cooperation, the deal was won. The deliveries were divided between Lahden Rautateollisuus and Rauma-Repola. Raute's share consisted primarily of the machines that would be housed within the factory building. Lahden Vaaka delivered the production facility's data collection and printing system.

The Beeskow deal made the company's financial situation easier and doubled its net sales over two years— when in 1977, the net sales were roughly FIM 75 million, by 1979 they totaled FIM 154 million.

But even the Beeskow deal and improved orders on hand did not mean the company's concerns vanished overnight. *"Its shortcomings include the transaction prices and terms of payment, which are worse than average, and the lack of variety in how it employs our different departments. The work is partly more demanding than what we are used to which, combined with the tight financing situation, will require increasingly goal-oriented efforts from all of us. Only by being diligent and economic can we secure the budding development,"* said an article in the first-ever issue of Raute's personnel magazine, Rautelainen, in January 1978.

LVL BECOMES THE THIRD PILLAR

The production of LVL, made from peeled veneer with the aid of adhesives, had begun in the United States at the turn of the 1960s and 1970s. In Finland, Metsäliiton Teollisuus, nowadays known as Metsä Wood, took the first steps in the production of an equivalent product in 1975.

Today, sturdy LVL products glued from strength-graded softwood veneer are used in all construction, but at the time, the technology



International visitors in front of Raute's head office in Lahti.

was still new and there was no machinery for it. Metsäliiton Teollisuus built a small pilot line at Punkaharju, which enabled it to learn the basics of LVL production. Once Metsäliitto had sold its old pilot line to Australia, it needed a new line—and rapidly. The deal on the new type of veneer beam line was made in 1985.

“Once the people at Metsäliiton Teollisuus had all the pieces in place, and the operations were underway, they contacted Lahden Rautateollisuus. We then designed and installed the first actual industrial line,” says Raute’s LVL technology manager Hannu Sinko, looking back at the early days of LVL production in Finland. The new line was characterized by increased capacity and a higher degree of automation—the line’s operation required four workers. It allowed the production of all beam lengths required by a customer without sawing waste, which gave it a significant advantage over lines producing cut-to-size products.

Pretty soon, LVL became the wood processing industry’s third



Neuvostoliiton ulkomaankauppayhtymien edustajat Konstantin Prikhodchenko ja A. A. Zimin ja Lahden Rautateollisuuden toimitusjohtaja Heikki Mustakallio ja johtaja Harri Säkijärvi allekirjoittivat yhteistyösopimuksen, jonka lahtelaiset toivovat johtavan suuriin idänkauppoihin.

Rau-Te ja Plan-Sell mukana miljoonien idänkauppasopimuksessa

3.11.79

Lahden Rautateollisuus ja heinolalainen Plan-Sell Oy neuvottelevat miljoonien markkojen Neuvostoliiton-kaupista. Perjantaina allekirjoitettiin Lahdessa yhteistyösopimuksia, jotka antavat näille yrityksille ja kolmantena Valmetille mahdollisuuden tehdä yhteensä jopa 400 miljoonan markan vuotuiset idänkaupat.

Neuvostoliiton ja Suomen väliseen kauppayhteistyöhön on perustettu jaosto, joka neuvottelee toisaalta puuntyöstökoneiden viemisestä Neuvostoliittoon ja toisaalta metallintyöstökoneitten tuomisesta Suomeen. Viisivuotisrunkosopimuksen mukaan Suomi vie Neuvostoliittoon vuosina 1981 — 1985 kaikkiaan 350 — 400 miljoonan markan arvosta puuteollisuuden koneita. Maitten välinen yhteistyöelin on

päässyt neuvotteluissaan niin pitkälle, että kolme suomalaista yritystä, Rautateollisuus, Plan-Sell ja Valmet sopivat perjantaina yhteistyön jatkotoimista. Tarkoitus on, että Rau-Te vie Neuvostoliittoon vaneriteollisuuden laitteita, Plan-Sell saha- ja Valmet lastulevyteollisuuden koneita. Rauten toimitusjohtaja Heikki Mustakallio mukaan näihin sopimuksiin perustuvilla kaupoilla tulee olemaan melkoinen merkitys. Kauppoja ei ole vielä neuvoteltu, joten on ennen aikaista sanoa niihin liittyviä markkamääriä. Rautateollisuus käy jatkuvaa idänkauppaa ja Neuvostoliiton myynnin osuus sen liikevaihdosta on viime vuosina ollut noin viidesosa. Nyt neuvoteltavan yhteistyöproiektiin käytännön toteutus alkaa



A picture of the participants of the first ever Wood Safari. The group's destination in 1988 was the United States. Over a two-week period, the participants toured 16 mills.

pillar, in addition to the plywood and particle board technology. The lines were delivered to both Metsäliitto and companies in the United States, and by the 1990s, LVL was already generating significant business alongside plywood.

“LVL is based on peeled veneer. To be a little simplistic, it’s produced by cutting a log on a lathe into veneer and then arranging the veneer into a nice order. After that, you glue the required amount of veneer together. This results in wood material which is of an ideally consistent quality and has an excellent grade of strength compared to sawn wood,” adds Sinko.

Lahden Rautateollisuus’s solid skills in veneer and plywood technology also helped it capture markets in the production of LVL lines. The company’s technological success in LVL production was, and still is, based on mastering the entire production process: from extensive market knowledge and a deep appreciation of the raw materials’ properties to the production technology, lay-up, pressing and billet handling of LVL veneers.

As I am writing this, more than 50 percent of the LVL produced in the world is produced with machines delivered by Raute. Raute is



Domestic sales required continuous interaction with clients.

also the only company in the world to offer its clients comprehensive technological solutions for the production of plywood, veneer and LVL.

PRODUCT DEVELOPMENT IN COOPERATION WITH CLIENTS

Throughout its long history, Raute has understood the value of client industries not only as clients, but as partners in product development. This has resulted in technological solutions that have benefited the entire industry in addition to numerous clients.

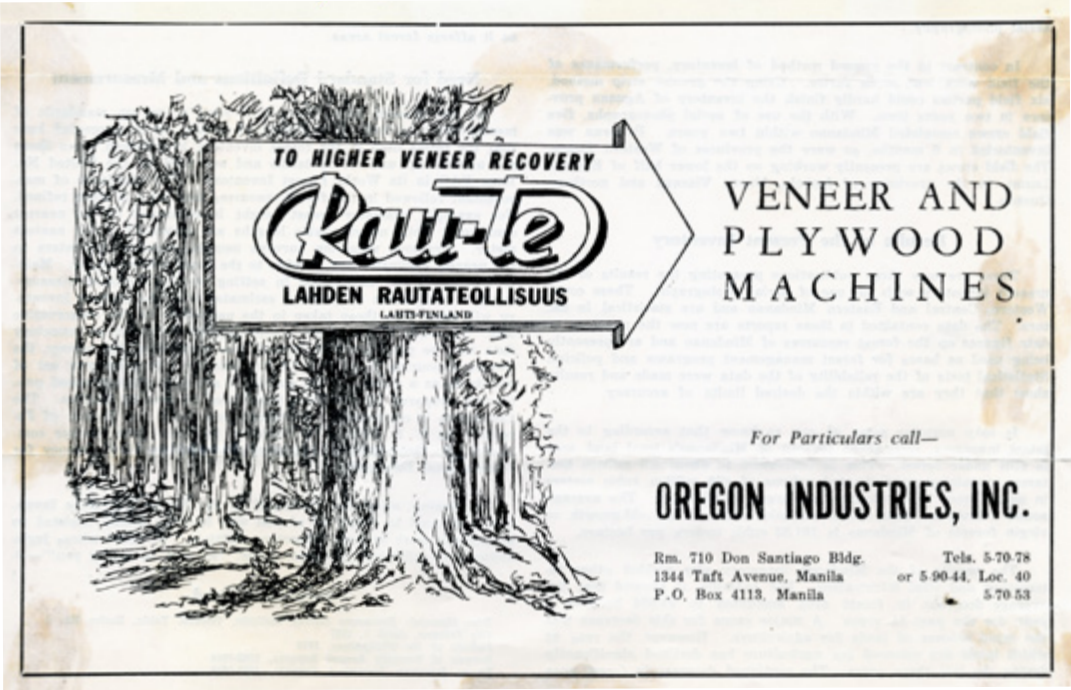
In the 1980s, the cooperation was enhanced with the purchase of a log cabin at the ski resort of Ylläs, where the company held get-togethers dedicated to product development with Finnish clients a couple of times a year. The setting provided a place where the participants could, away from the daily hubbub and noise of their workplaces, focus on what should be developed to make clients’ operations increasingly efficient and competitive.

When a target of development had been agreed at one of these get-togethers, it began to be implemented at various organizational levels. The designs were made on the drawing boards and tests were run on the factory floor. When a test run by the factory failed, the design engineers went back to the drawing board and started again. The cycle then continued until the objective was met.

Thanks to the continuous product development, the machines rapidly became more powerful. Kaunisto gives an example of this: Whereas in 1970, one cubic meter of plywood required 20 hours of work in Finland, in the early aughts, one cubic meter of birch plywood required four hours of work, and a cubic meter of softwood plywood 1.5 hours of work. The same development applied to all lines.

The pilings of wet and dry veneers provide another good example of enhanced product development. Until the automation of the lines which occurred in the mid-1970s, they were done manually.

“The clients gave a new target every year: 10 percent less workforce or more power. Human hands were replaced by machines, and speeds kept being accelerated until, by the turn of the century, we’d reached the end of one road,” says Kaunisto who, in addition to domestic sales, strongly influenced product development together with product development director Matti Paakki.



A Lahden Rautateollisuus ad in an American newspaper.

As the efficiency increased, the number of plywood mills in Finland decreased. The remaining mills were expanded with the machines left over from the defunct production locations. Naturally, this also impacted the operations of Lahden Rautateollisuus.

“At one point, I had 30 project deliveries a year. When the market dwindled, I ended up having a project delivery once every two years,” says Kaunisto, looking back at the time.

In 1990, Finland produced the most plywood in Western Europe. With a total production of 617,000 cubic meters, it ranked tenth in the whole world. Only five Finnish plywood producers produced this entire volume of plywood.

THE HISTORIC WOOD SAFARIS

The Wood Safaris also represented product development of a kind and especially the fostering of customer relationships. A Wood Safari was an expedition organized by the corporation that was composed of Finnish mill and factory directors, as well as industrialists.

During these safaris, the participants toured production facilities around the world specializing in the production of plywood and veneer. While Raute arranged and organized the safaris, the costs were split between the participants.

The thought of the Wood Safaris was born out of the frustration that Finnish industrialists felt at Russian and American visitors touring Finnish facilities. The Americans, in particular, visited Finland in force during the 1970s and 1980s, with the aim of touring the local plywood mills. For Lahden Rautateollisuus, these tours of the mills and factories represented important sales channels, so when the then local director of the Punkaharju plywood mill, Keijo Tolvanen, told Reijo Kaunisto, who was responsible for domestic sales at the time, that this was the last time that he would be accepting any guests, Kaunisto suggested to him a reciprocal visit from Finland to the United States.

This is how the first Wood Safari came about in 1988. Its destination was North America, and during the two-week safari, the participants toured 16 mills.

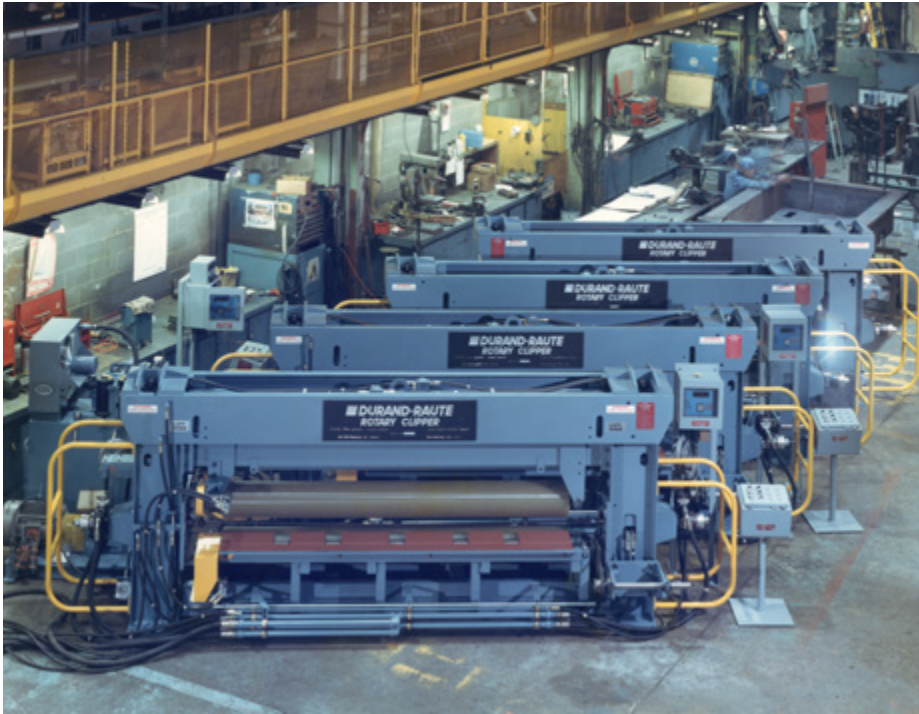
“We took a plane from one place and mill to the next. The only thing you were left with was total chaos in your head,” says Reijo Kaunisto with a laugh.

Yet the idea was a good one. The Finnish industrialists were overjoyed to have the opportunity to talk in peace with their colleagues. In a small country, these conversations served to broaden the views of everyone involved.

All in all, the company organized well over a dozen safaris to destinations like Indonesia, Malaysia, Australia, South America, across Europe and, on several different occasions, the United States, before the activity faded away. The last Wood Safari was organized in 2004.

SOFTWOOD PLYWOOD TO THE RESCUE

In the United States, safari participants toured particularly mills which produced plywood made from coniferous trees, which made the tour participants think about the potential to produce such plywood in Finland as well. The common perception was that a small country would not have a big enough market for it— that the production of softwood plywood would be simply unprofitable, and that birch would yield a better price.



Durand-Raute's rotating veneer cutters in a row.

“What happened then was that Metsäliitto was provided with an abundance of extra spruce. They considered the establishment of a spruce sawmill, but Keijo Tolvanen, the director of the Suolahti plywood mill at the time, made an alternative calculation on the establishment of a plywood mill that would produce softwood plywood. Based on his calculations, the latter would be cheaper to establish than a spruce sawmill and would yield double the return of sawmilling,” says Kaunisto.

Success requires a little luck and the right timing, in addition to good products. Lahden Rautateollisuus had acquired the Canada-based Durand Machine Company Limited in 1982. The Canadian company specialized in the automation of softwood turnery, among other things, and had developed state-of-the-art equipment for the needs of North America’s plywood industry. Without this corporate acquisition, Lahden Rautateollisuus would not have been able to submit a tender concerning the new mill to Metsäliitto. Thanks to Durand, the company was also able to deliver complete line solutions for softwood plywood. Kaunisto rapidly submitted a tender

on the machines to Metsäliitto, and the idea of a mill that produced softwood plywood was nailed down at Metsäliitto. The sawmill idea was abandoned. And then Metsäliitto called a time-out on the entire project.

“Metsäliitto wanted to find out whether it should purchase an existing mill in the United States after all, instead of building a new one,” says Kaunisto.

In Finland, scarcity of birch—the principal raw material of plywood—had also made Schauman Wood’s then production director, Olavi Mikkola, think about the use of softwood logs in plywood production, although not for the first time. Mikkola had, in fact, performed who-knows how many calculations on the subject over the years, but none of them ever indicated a sufficient level of profitability.

“Softwood plywood was being imported to Europe from North America for a pittance. We wouldn’t even have gotten wood to the mill gates for that price,” Mikkola says.

But the bad recession in the 1990s changed everything. It translated into devaluation first and then the floating of the Finnish markka and a topsy-turvy situation. In light of the new figures, Schauman Wood decided to build Finland’s first mill producing softwood plywood in the area of its Pellos particle board mill, which was to be shut down. An offer for the new line was requested from Raute.

“That was rapid action. The mill project progressed from the offer to the deal in a matter of weeks,” says Kaunisto, looking back at the event.

“Raute Wood Processing Machinery Oy is building production lines worth 60 million at Schauman Wood Oy’s Pellos mill in Ristiina. The line, which will produce softwood plywood, will be the first of its kind in Finland. The deal is one of the biggest made by Raute’s wood processing machinery business over the past few years,” said an article in the newspaper Etelä-Suomen Sanomat on August 12, 1994.

The Pellos particle board line was shut down on May Day Eve in 1994. Finland’s first mill producing softwood plywood was inaugurated in Pellos in November that same year. The mill produced plywood in three shifts, 365 days a year.

Metsäliitto placed an order for an equivalent mill of its own soon after the Pellos mill was in operation.

“If you can ever claim that something happened at exactly the right moment, that’s the start of this plywood production in Finland. Without it, Finland’s plywood industry would have withered away because of the steep drop in demand for Finnish birch plywood after the mid-1990s,” says Kaunisto, who was in charge of domestic sales at Raute at the time.

One reason for the market change was the imports of plywood from the East. At approximately 2.2 billion cubic meters, Finland’s forest resources are sizeable, but the forest resources of Russia amount to a whopping 82 billion cubic meters. The country holds no less than one fourth of the entire world’s forest resources. Its vast raw material reserves and capital also made it a strong plywood producer. Russian birch plywood mills began selling their own products in the same markets as their Finnish counterparts, with the Russians relying on price as their competitive edge.

The shift to softwood plywood technology represented a big leap for Raute. Its machines were markedly more efficient and better than those of its US competitors like Coe. At the same time, more countries began to restrict the export of raw wood and require forestry compliant with sustainable development. As a consequence, the size of the wood used decreased, while the use of planted forests increased, and the wood raw material began to be utilized as thoroughly as possible. This increased demand for technology focusing on small-dimensioned wood that conserved the raw material, which Raute’s machines represented. The new technology opened entirely new markets for the company.

Pekka Leppänen, Raute’s managing director from 1985 to 1992, says that Reijo Kaunisto was a key person in the development of the Finnish plywood industry. Furthermore, skilled in both technology and the management of good customer relationships, he achieved significant growth in Raute’s domestic sales, in cooperation with Matti Paakki, who was responsible for product development.

The trade was being carried out according to the principles of western trading, whereas before, one deal may have yielded up to dozens of orders at its best.

A GRITTY SALES PROFESSIONAL

When Reijo Kaunisto in 1975 followed Ahti Akkanen in taking charge of the company’s domestic sales, there were some 30 small plywood mills in Finland. Managing director Heikki Mustakallio knew all of them personally.

It was also important for the new chief sales rep to manage customer relations and understand more of the technology than clients did. At this point, the company already wanted to solve its clients’ problems beforehand and offer the best possible solution to every situation.

The changing of the guard with Akkanen was easy: When Kaunisto took over, the company did not have a single deal to conclude or tender process underway in Finland.

The oil crisis hit Finland, too, with full force. Demand for plywood dropped significantly, and in 1975, the mills brought their production to a halt for up to three weeks. The next year, when the day came that Heikki Mustakallio walked into Kaunisto’s office and noted that the company was broke, the two men faced a situation where they had to come up with some work for the factory or furlough the entire factory crew. What could they produce for stockpiling? Kaunisto thought for a moment and then suggested that the factory staff be put to work

on chippers and veneer cutters. Once things started looking better, these products would be in demand. This was done and when the economy rebounded, the stockpiled equipment was sold to Finnish buyers.

Mustakallio and Kaunisto also had a similar conversation in the 1980s. On that occasion, the company manufactured ten computer-controlled XY block centering devices and five lathes for stockpiling, keeping the factory staff employed.

Kaunisto made his first deal in 1976. In Toijala, a small mill called Craftwood and its owner wanted to modernize the mill’s lathe line.

“I looked at the line and scratched my head. Eventually, I had to concede that you couldn’t modernize a line like this. There was simply nothing there to modernize.”

The client’s only option was to purchase an entirely new lathe line from Lahden Rautateollisuus.

“The factory people were overjoyed about the deal and could hardly believe it. The factory’s operations were relying on temporary work at the time, and the deal couldn’t have been made sooner,” says Kaunisto with a laugh. Just like Heikki Mustakallio, Reijo Kaunisto knew all the Finnish industrialists.



An aerial photograph of Pello Oy's Ristiina mills. Timber being stored in the lake in front of the mill.

CLIENT STORIES

COOPERATION SPANNING NEARLY 60 YEARS

Raute's shift from the production of individual wood processing machines to supplying entire production lines and units marked a significant turning point in the company's history. Its first complete production unit, or factory, was delivered to Pello, in Ristiina, in 1968.

The cooperation between the companies had begun a few years earlier, when vuorineuvos (Finnish honorary title) Aarne J. Aarnio had ordered forming stations from Lahden Rautateollisuus for the particle board factory he had established in Pello in 1962.

The design of the plywood mill in Pello began in 1964. After a promising start, the project halted because of uncertainty over whether Pello fell under the scope of a development area or not. This played an important role in the project because half the investment loans were credits pursuant to the Regional Development Act. Parliament finally adopted a favorable decision and in March 1967, the ball began rolling. Lahden Rautateollisuus Oy and Pello Oy signed an agreement on the delivery of the plywood mill's principal machinery. The target production level determined for the mill was 30,000 cubic meters of conventional plywood a year and the capacity of the machinery was dimensioned according to a production of 38,000 cubic meters. The delivery consisted of four automated lathes, three continuously operating net dryers, a cutting department, gluing department and veneer jointing machinery, as well as some of the conveyors, sawmills and other necessary equipment. In 1970, Lahden Rautateollisuus Oy delivered gluing equipment and a finishing line to Pello.

"There are still some machines operating in Pello that were delivered by Lahden Rautateollisuus back in the 1970s. They've been modernized

over the years, but the machines are still the same,” says Juhani Tenhunen, Vice President, Production and Operations, UPM Plywood.

CONTINUOUS DEVELOPMENT

While the cooperation, which has continued for nearly 60 years now, has meant production development for Pellos, for Raute it has meant product development.

In the early years, when the world was different, ideas for the development of production were sought during joint tours of plywood mills around the world. Back in Finland, meanwhile, the partners got together at least once a year to come up with new ideas. For example, Finland’s first softwood plywood mill was planned and designed over a week-long seminar held in Lapland.

Although the world has changed in 60 years and there is no longer time for week-long development seminars, technology development is still a key aspect of operations at Pellos, one in which Raute plays a big role. Tenhunen says that the production unit is constantly thinking about how to improve the efficiency and quality of production or the utility function of wood use. And this is something in which long relationships prove beneficial. When both parties know the people, technology and mills on each side, you have a mutual understanding.

“Our job is to know what we want. Raute’s job is to offer services or technologies that can solve these challenges.”

Sauli Salmela, currently the head of Raute’s domestic sales, agrees. When you know a client well, you can offer them the right products, sometimes even before the client knows that they need them.

“Although new lines are not made often, there’s always something. Old lines become subject to repair investments and lines are modernized. It’s easy to offer the right solutions for them when there is a partnership in the background that has lasted well over half a century.”

Tenhunen lists Raute’s proximity, its domestic origins and wide product repertoire as its strengths: “Raute is at the forefront of technology and can provide solutions to a multitude of problems. The product development has been good and the machines have been reliable”.

In recent years, Raute has invested in computer vision. There have also been improvements in ergonomics, machine safety and energy efficiency.

The use of the data gathered from the lines in process optimization is growing all the time. The lines are being optimized based on the analyzed data, and their usability is improved. Long-term customer relationships come in particularly handy in this respect. The collected data involves the client’s confidential business information and the client’s trust in its business partner must be unwavering.

Tenhunen lists
Raute’s proximity,
its domestic origins
and wide product
repertoire as its
strengths.



"Täysinä autokuormina"



PROFILE

A GURU OF EASTERN TRADE

In a 60th birthday interview, the press dubbed *vuorineuvos* Heikki Mustakallio (1924–1998) a guru of eastern trade. At the time, Mustakallio had just returned from China with a FIM 40 million trade deal for Raute in his briefcase.

During Mustakallio's time, trade with the Soviet Union was so robust that he described himself as a full-time traveling salesman.

"The way the buyers there saw it was that when things were being negotiated and agreed, the managing director had to be present," he said in an interview published in the newspaper *Uusi Lahti* in 1995.

In addition to the eastern trade, Mustakallio invested in the company's marketing, product development and exports. His personal interest in product development kept Lahden Rautateollisuus competitive and made it a key figure in the world of the production of plywood and board industry machinery and production lines. To promote the company's position in the global markets, Mustakallio was active in the metal industry exports organization Metex. He also established subsidiaries in North America and South America and created the company's own network of representatives in the most important export countries.

Heikki Mustakallio

Lahden Vaaka Oy's technical director in 1952–1960; Lahden Rautateollisuus Oy's deputy managing director in 1966–1970, managing director in 1970–1985, member of the Management Board as of 1955 and its chair in 1974–1985, chair of the Board of Directors in 1985–1988, and chair of the Supervisory Board in 1988–1992.

As a manager,
he was strict,
but also fair
and just.

Heikki Mustakallio (M.Sc. (Engineering)) joined Rautateollisuus Oy as the technical director of its subsidiary Lahden Vaaka in 1952. He was appointed as the Group’s deputy managing director in 1966.

When vuorineuvos Aarne Mustakallio died in 1970, the youngest of the brothers, Heikki, became head of the family business. His term as the managing director lasted from 1970 until 1985, when he became the full-time chair of the company’s Board of Directors (1985–1988). This also marked the first time that Lahden Rautateollisuus hired a person outside the family, Pekka Leppänen (M.Sc. (Eng.)), as the company’s managing director.

When he stepped down as chair of the Board of Directors, Mustakallio became the chair of the company’s Supervisory Board, composed of family members. He took care of the position until 1992.

Co-workers and friends described Mustakallio as unpretentious and quiet. His long-time secretary Leena Lottanen remembers him as a warm-hearted person who was a good listener. There was no subject that could not be discussed with him. As a manager, he was strict, but also fair and just. He considered his decisions carefully, but once he made one, it held.

On the factory floor, Heikki Mustakallio was respected. Like his father Henrik Schwartzberg, he toured the factory every day. Heikki’s eldest child, Leea Kultanen, remembers many occasions when she joined her father on an evening tour of the factory floor. The factory smelled of iron, and it was dark. Her father circulated among the evening shift workers, asking them how they were doing and faring.

“Dad wanted to know what was going on at the factory and how people were doing. It was really important not only for dad but the employees. They felt that they and their work were appreciated,” says Leea Kultanen.

Managing the family business was important for Mustakallio, but so was his own family. Back when the factory was still in the center of Lahti, and the family lived close by, Mustakallio walked home for lunch at 12 o’clock sharp, every day.

Heikki Mustakallio’s bookplate depicts a man looking at an ascending parabola from a factory roof. The parabola, reaching for infinity, is a fine symbol of Mustakallio’s interests. *“The parabola rises to eternity, but reaches a limit when it comes to human knowledge and wisdom, of course,”* said Mustakallio in an old interview.

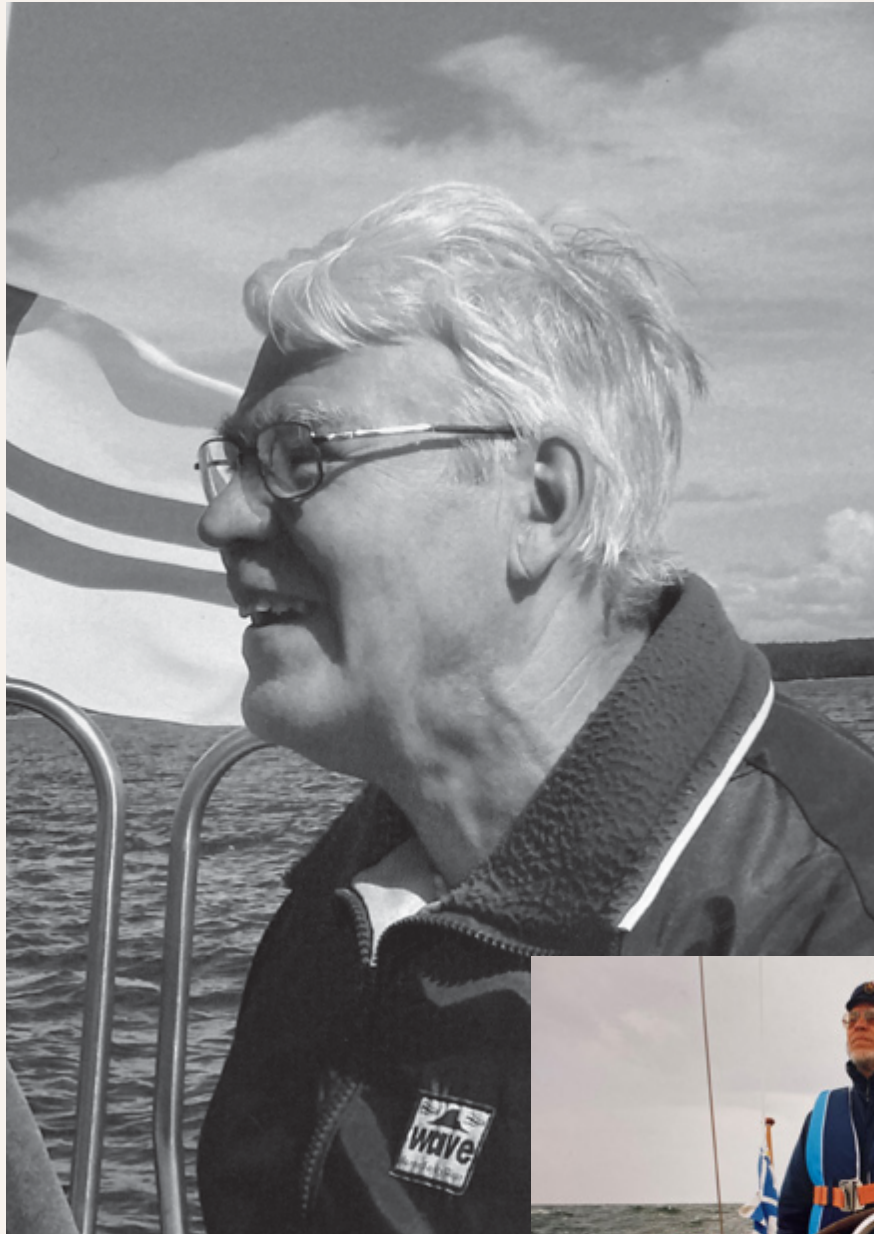
While he was active in working life, Mustakallio’s most important hobby was nature photography, mainly plant life and flowers, both of which he was fascinated by. After he retired, he also began studying philosophy at an open university and collected an extensive library of philosophical works. When his children were young, the family went on boating, fishing, camping and skiing trips.

Heikki Mustakallio led the Lahti chamber of commerce in 1972 and became its first honorary member. The President of the Republic of Finland granted Heikki Mustakallio the honorary title of vuorineuvos on June 6, 1980.

“Lahti gained a great man last week as Heikki Mustakallio became the nation’s latest vuorineuvos. Mustakallio is indeed a man of great measure as the manager of Rautateollisuus and an influencer of economic life, a member of the chamber of commerce and so on. Congratulations! The title of vuorineuvos is also a distinction for the entire region,” wrote the journal Yrittävä Häme in June 1980.

Elected entrepreneur of the year in the Päijät-Häme region in 1984, Heikki Mustakallio was born and went to school in Lahti. He graduated from high school in 1943 and took part in the Continuation War. During his time, Raute Oy was widely involved in charitable causes, sponsoring several cultural and veterans’ associations and institutions, among other things.

Heikki Mustakallio’s family included his wife Annikki (née Sovila), their daughters Leea and Heli, and son Mikko.



Ilkka Lapinleimu renewed the operations and machinery of Lahden Rautateollisuus.

PROFILE

FACTORY MODERNIZER

Ilkka Lapinleimu (1936–2021) joined Lahden Rautateollisuus as a production manager in 1966, having previously worked in the Tampere-based Lokomo. His recruitment proved significant, because Lapinleimu thoroughly renewed the factory's operations.

Lapinleimu was interested in machine shops' new production trends, which were also tried and adopted at Lahden Rautateollisuus.

"Ilkka was curious about the new trends in machine shop engineering. We often stayed at the office for a while after workdays to think about how things at the factory could be done better and more efficiently," says Veijo Kauppinen.

The target of their first restructuring measure was the old foundry. Kauppinen and Lapinleimu started by investigating what was done there, finding out that essentially nothing useful was produced in the foundry. Moreover, the steam pressure required by the steam hammer necessitated the boiler room's lengthy heating, in addition to which the blows of the hammer shook the whole factory, clearly damaging any pieces being machined simultaneously. The work at the foundry also required the use of actual toxic substances, like cyanide, which the company was keen to get rid of.

One of the significant new aspects of the operations was the placement of “methods men” in the product development department, where they acted as consultants.

Change is always challenging. Some of the older employees formed a delegation and marched into Aarne Mustakallio’s office to convince him that the factory would go bankrupt were the foundry to be closed. The company’s management nevertheless had an open mind towards Lapinleimu’s visions of an ideal factory. The foundry was closed and the premises it had occupied were put to better use.

Says Pekka Käksi, who worked in the turner’s shop in the ‘60s:

“The machining was rudimentary when I began working at Raute. The factory used mostly high-speed steel tools. Sometimes, the brittle shavings were even loosened with carbon steel tools. Then along came Ilkka Lapinleimu, and everything changed. He took Raute into the modern age. All at once, the factory was fitted with an enormous number of machines and the old tools were carried away and replaced by a full range of hard alloy technology. We bought a CNC machine tool from East Germany and Veijo went overseas to buy new lathes. Škoda even made a numerically controlled reamer for the factory.”

Kauppinen also emphasizes the significance of the new tools.

“We brought the latest available tools into use. And you no longer had to stand in line for them. Instead, they were brought to the machines and picked up again after you were finished with them. We also drew up factory standards for the company.”

The machine shop of Rautateollisuus was of an ideal size. It was small enough, but also sufficiently large for the testing of any new methods. If the new arrangements didn’t work, they could be pulled back easily enough, giving way to another test or trial.

One of the significant new aspects of the operations was the placement of “methods men” in the product development department, where they acted as consultants. The department lacked information on production requirements. Because of this, the production of many structures was difficult and expensive. The methods men were tasked with the proactive identification and elimination of any product development and production problems. This type of simultaneous or parallel design was subsequently adopted widely elsewhere as well. The time of cellular manufacturing and JIT manufacturing would not occur until later.

When Lapinleimu moved to other tasks in 1968, Kauppinen continued to modernize the factory in his capacity as production manager.



Head of Russian trade Astrid Vähä-Touru, vuorineuvos Heikki Mustakallio (right), and managing director Pekka Leppänen (center).

OUR TALENT IN EASTERN TRADE

Astrid Vähä-Touru played an important role in the success of the company’s trade with Russia. For years, she worked as Heikki Mustakallio’s secretary and, being fluent in Russian, always accompanied him on business trips. She was also present whenever delegations of the Soviet Union’s (and later Russia’s) foreign trade ministry visited the factory. Vähä-Touru got along well with the Russians, was proficient in the language and gained valuable inside information through her socializing with the visitors.

When the Soviet Union collapsed and trade with the country came to a sudden halt, Vähä-Touru was able to rekindle the trade relations little by little, after years of silence, by contacting old acquaintances.

Born in Estonia, Vähä-Touru was appointed head of the Soviet Union trade and member of the Wood Processing Machinery unit’s management board in 1987. She retired on July 31, 2008.



A demonstration held by metalworkers passing through Aleksanterinkatu in Lahti during the 1971 metalworkers' strike.

Photo: Valokuvaamo Halme, Työväen arkisto

STORIES FROM RAUTE

LENGTHY INDUSTRIAL ACTIONS

“*Right-wing social democrats restless – scuffles related to politicking at Lahden Rautateollisuus Oy.*”

“Labor dispute at Lahden Rautateollisuus Oy, 53 workers quit.”

“Communists threaten other workers in Lahti.” “Lahden Metalli defiant—pennies will not cut it.”

The readiness for strikes in Finland ran high throughout the 20th century, especially during the 1970s and 1980s, when it seemed almost as if some groups were making a second career of being on strike. According to Statistics Finland’s statistics on labor disputes, an average of more than a million workdays a year were lost due to labor disputes in the 1970s.

These strikes also had an impact on Lahden Rautateollisuus. Veijo Kauppinen, who worked for the company for years, recalls the susceptibility to strikes typical at the time: *“Sometimes you went on strike for a reason, sometimes without one. There were sit-down strikes and hour-long stoppages, day-long strikes and long strikes. You always needed to be prepared for a future strike. One would be coming, as surely as the weekend. There were two different unions at the time for metalworkers and a few unaffiliated believers to boot,*

Mistä metallityöväen lakossa on kysymys

Metallityöväen Liiton vaatimuksen mukaan tulisi vanhemman ammattimiehen peruspalkan olla I paikkakuntaluokassa 115 markkaa. Tähän olisi maksettava tuntityössä 15 prosentin urakkahyvitys. Muiden palkkaryhmien ja paikkakuntaluokkien palkat määräytyisivät 5 prosentin porrastuksella tästä palkasta kuten tähänkin asti on tapahtunut.

Metalliteollisuuden Työnantajaliiton ehdotuksen mukaan tulisi ammattimiehen peruspalkan vastaavassa tapauksessa olla 71 markkaa, johon aikatyössä maksettaisiin 15 prosentin urakkahyvitys.

Urakkatyön hinnoittelun tulisi kummankin ehdotuksen mukaan tapahtua niin, että työntekijän urakka-ansio nousee normaalilla urakkavauhdilla 30 prosenttia ehdotettua tuntipalkkaa korkeammaksi.

Metalliteollisuuden Työnantajaliiton omien tilastojen mukaan maksetaan ammattimiehille Helsingissä nykyisin tuntityössä keskimäärin 116 markkaa 17 penniä ja urakkatyössä keskimäärin 148 markkaa 15 penniä tunnilta.

Mitä kummankin liiton ehdotukset merkitsevät?

Metallityöväen Liiton ehdotuksen tarkoituksena on yksinkertaistaa palkkajärjestelmä, ja sen mukaan turvattaisiin esimerkiksi Helsingissä ammattimiehille tuntityössä 132 markan tuntipalkka ja urakkatyössä 150 markkaa tunnilta.

Metalliteollisuuden Työnantajaliitto pyrkii siihen, että työehtosopimus antaisi työnantajille mahdollisuuden alentaa esimerkiksi ammattimiesten palkat tuntityössä 82 markkaan ja urakkatyössä 92 markkaan. Toisin sanoen he pyrkivät siihen, että työntekijäin nykyisiä ansioita voitaisiin alentaa jopa 50–60 markalla tunnilta.

METALLITYÖLÄINEN, TIEDÄTKÖ NYT MINKÄTÄHDEN OLLAAN LAKOSSA.

Suomen Metallityöväen Liitto r.y.

who added some color to the whole affair. So the scenery was colorful and tensions could run high pretty easily. The strikes were often local squabbles at a time when many people were politically active."

The company's 1920 annual report notes that "communist trends are making themselves increasingly known among the working population. Indeed, these left-leaning sentiments have gone so far that we are compelled to acknowledge that half of our workers are communists".

Finland experienced one of its longest strikes ever in 1927, when 9,000 metalworkers staged a seven-month work stoppage. "This work stoppage was the only more serious labor strife which the company (Lahden Rautateollisuus) has been involved in throughout the time of its operations. Not all occurrences of disorder that took place on the worksites in 1917 and 1918 can be considered labor strife. Rather, they were attributable to the political disarray at the time," reads the Board of Director's report.

The backdrop to the 1927 work stoppage was a metalworkers' strike at the Turku A/B Crichton-Vulcan and A/B Alex Sjöholm factories. In the hope of ending the strike, the employers' association declared an industry-wide work stoppage, which nevertheless failed to have the hoped-for effect. The metalworkers supported the strikers and did not put pressure on them to the end the strike, as the employers had hoped they would.

In line with the spirit of the times, there were also attempts to break the strike with the help of strikebreakers. The strikebreaking organization Export Peace (Vientirauha) had been established in Finland in the early 1920s to guarantee industrial peace. In addition to breaking strikes, the organization focused its activities against what it dubbed worksite terrorism. Export Peace was led by the activists Martti Pihkala and Vihtori Kosola.

It did not do so well in the strikebreaking activities either, given that the "Pihkala Guard", which took the employers' side, was composed of uneducated folk who were unable to stand in for the metalworkers. The Guard members were a group of far-right sympathizers cobbled together from the region of Southern Ostrobothnia, whose brawling and boozing also managed to turn the public opinion to the strikers' side.

Minister of Social Affairs Helo was eventually able to mediate an agreement between the parties, and the strike ended on December 20,

1927. The long work stoppage concerned more than 60 metal factories and hindered the production of Lahden Rautateollisuus for more than seven months. When the work finally resumed, the atmosphere among the workers was calm, according to the Board of Directors’ report. *“Even so, those participating in the stoppage did to some extent harass the workers hired in early 1928, during the stoppage. Due to this harassment, five of the workers taking part in the stoppage were dismissed. After this, the peace seems to have been restored, at least for now.”*

UNION MEMBERSHIP WAS A MUST

Markku Lindgren, who joined Raute as a painter’s apprentice during his vocational studies in 1969, says that during the 1970s and 1980s, the factory workers were either social democrats or leftist people’s democrats, and there was fierce competition between the two political movements. Recruiters from both factions went doggedly after all new employees. At workplace meetings, one of the opposing parties always argued against the other—simply for the sake of principle. Lindgren did not belong to either party. For a while, he and four other nonunion workers were put under a lot of pressure. Their names were posted with a note indicating that they were not unionized workers on every bulletin board.

“Back then, everyone knew precisely who belonged to which group and union. Fortunately society changed, and the situation calmed down.”

Lindgren remembers how Jaakko Tirronen, an inspector who belonged to the social democrats, every Friday donned his boots and breeches and a woollen coat, carefully folded the newspaper Uusi Suomi into its breast pocket so that the logo would without fail be visible, and headed off to his cabin for the weekend. This was a source of great irritation to the opposing party.

WILDCAT STRIKE OF THE SEVENTIES

Some 70,000 metalworkers across the country took part in a 1970 wildcat strike. The actual industrial action began in February 1971, when the Metalworkers’ Union rejected the proposal for a settlement made by the then National Conciliator Erkki Sunila.

The workers demanded general increases of FIM 0.20–0.30 to time work and either a change in the basis for piecework or a transition to time work.

In Lahti, the strike was put to a ballot. At the local office of the Metalworkers’ Union, the voting was supervised by Aleksi Myöhänen and Risto Ahonen, chief shop steward and deputy chief shop steward, respectively, at Lahden Rautateollisuus. Nearly 80 percent of the workers voting in Lahti were against the strike. Despite this, the strike also extended to Lahti.

“Wildcat strike threatens to gain strength” ran a headline in the newspaper Uusi Suomi on September 15, 1970. The article said that the illegal strike that had begun at the Lahti factory of Rautateollisuus on September 5, 1970 was continuing. The strike was attributable to wage disputes. The workers demanded general increases, while the employer maintained that it could not yield to the demands in the middle of an agreement period.

“The wage negotiations held at the Lahti and Nastola factories of Lahden Rautateollisuus Oy were broken off with no settlement in sight on Monday. Following the failed negotiations, both factories staged a strike that lasted for the afternoon and halted work in all the departments. Sympathy strikes took place simultaneously at several metal industry workplaces. All in all, some 3,600 workers were involved in the strike,” said the article in the newspaper.

The number of workers on strike at Lahden Rautateollisuus, Lahden Vaaka Oy and the company’s Nastola factories amounted to 590. The workers demanded general increases of FIM 0.20–0.30 to time work and either a change in the basis for piecework or a transition to time work. The sympathy strike involved 1,400 workers from the Lahti factory of Upo-osakeyhtiö and around 1,000 workers in Nastola. The labor dispute lasted for nearly two weeks before the parties reached a deal.

Nationally, the strikers’ ranks were close and unified, and when a settlement was not reached, the strike ended after seven weeks, exceptionally based on a proposal by a conciliation board. The metalworkers got a 16 percent raise, in addition to which the concept of a vacation bonus pay was introduced to the labor market. The vacation bonus was later extended to other wage earners too.



CAPTURING NEW MARKETS

1982 The company acquires the Canada-based Durand Machine Company Limited. The new company is named Durand-Raute.

1983 A sales office is opened in Singapore.

Raute-Streif Oy is established with Streif AG to deliver machinery for the Tyumen timber home factory.

aims to streamline operations and facilitate exports.

The consolidated net sales grow from FIM 269.2 million to FIM 421.4 million, or by 56.6 percent.

Subsidiaries are established in the Federal Republic of Germany and Brazil.

Lahden Vaaka changes its name to Raute Punnitus ja Automaatio.

Raute is chosen as exporter of the year in the Päijät-Häme economic area.

1986 RWS-Engineering begins operations.

1987 The Qingdao plywood mill built by a Finnish-Chinese joint venture is completed.

1980

The company's name is shortened to Raute Oy.

1984 The company expands its market area to Southeast Asia.

The first veneer beam factory is sold to North America.

Raute Group is divided into three business areas: Wood Processing Machinery; Scales and Automation; and Furniture Industry. The organizational change

The Wood Processing Machinery operations move to Nastola.

1985 The Group employs 1,280 people.

Pekka Leppänen begins work as Raute Oy's managing director on March 1.

Vuorineuvos Heikki Mustakallio becomes a full-time chair of the Board of Directors.

1991 The collapse of trade with the Soviet Union plunges all of Raute's business areas into difficulties at the same time.

1992 Kari Airaksinen begins work as Raute Oy's managing director.

1993 The two-year decline ends.

1995 The share price of the recently listed company fluctuates from a low of FIM 28.50 to a high of FIM 88.90.

Raute opens a sales office in Santiago, Chile. The North American company experiences problems in the management of operations.

1998 Risto Mäkitalo begins work as Raute Oy's managing director.

1999 Raute invests in computer vision technology by acquiring an interest in Mecano Group Oy.

1999

1994 Sope Interior is divested.

Raute Oy is listed on the Helsinki Stock Exchange in September. The family business has grown into a listed company, while the family continues to be the chief shareholder.

Raute acquires the rest, or 40 percent, of RWS's shares from Schauman Wood Oy.

Raute Singapore is established.

Juha-Pekka Keskiaho, chair of the Board of Directors and member of the Mustakallio family on his mother's side, is named managing director. Keskiaho continues to internationalize the company and streamlines its operations.

The company acquires the entire share capital of the engineering firm Precision Service and Engineering (PS&E) Group. The Canada-based company is skilled in OSB technology.



China's forest minister visits Raute on September 16, 1988.

STORIES FROM RAUTE

EXPORTING TO NEW COUNTRIES INTENSIFIES

As early as 1934, the Export Association of Finland encouraged businesses and everyone involved in economic life to follow the development of foreign trade, citing the country's general economic recovery. *"The kind of conditions our country will be in next year and for the next few years will depend on the continuation or cessation of this development. Foreign trade that continues to run smoothly all the time will increase wellbeing at all levels of society, but if it does not run smoothly, we will soon face shortages again and many a household will be in trouble."*

Internationalization was increasingly important in post-World-War-II Finland. The country was being rebuilt, the displaced population was being housed and contacts abroad were being increased.

Everything in Finland was rationed—including wages. During the brief moment in 1950 when the rationing was not enforced, wages increased considerably. This led to cost increases, and a substantial overvaluation of the Finnish



Examining the quality of veneer with visitors.

markka, given that exchange rates were kept unchanged. All goods made in Finland were more expensive than those made abroad. The growth and development of many businesses, including Lahden Rautateollisuus, depended on the development of exports.

The war reparations had been securing employment and giving birth to new skills in the machine shop industry across Finland. The end of the war reparations deliveries in 1952 did not result in major changes in the situation of Lahden Rautateollisuus. The organization set up for the war reparations continued to operate well in the new situation, and the company continued to export its products to the Soviet Union.

MODERN PRODUCTION AS THE SECRET TO SUCCESS

The domestic market was too small for a factory specializing in the machinery of the wood processing industry. Moreover, it had been Rautateollisuus’s strategy from the outset to make inroads into the rest of the world by taking advantage of the margins achieved through the robust trade with the Soviet Union.

Achieving a foothold in export markets required a tremendous amount of work from a company based in a small country like Finland, but gradually the company’s efforts in this respect began to pay off, also outside the Soviet Union. The devaluation carried out in Finland in the autumn of 1957 also boosted the export activities of Lahden Rautateollisuus.

By 1958, some 30 pieces of special machinery sold under the brand Rau-te were already operating in plywood mills located in Australia and New Zealand. By the 1960s, machines with the brand name Rau-te could be seen on practically every continent, including North and South America, Africa and Asia. In 1961, the company delivered to Norway that country’s largest plywood board mill.

One reason for the global interest in the Lahti-based plywood machines was that the company closely followed the experiences of the machines’ users, developed the machinery, and kept its production constantly up-to-date.

To increase the recognition of the company name and Rau-te products, the company was always taking part in exhibitions, trade fairs and seminars across the globe. In forging the contacts necessary

The company entered the American market by setting up a sales office in Portland in 1974.

for trading, the company was assisted by the staff of the cooperative Metex as well as embassies, trade missions and other offices around the world. The marketing network was created with the aid of the company's own sales offices.

The global market area required a great deal of travel from Raute employees. The deals were first prepared. Once they had been won, the design, installation and test runs kept the fitters busy, sometimes for months on end. The company always aimed to include an installation and roll-out carried out by its own personnel in the deals it made. The fitters seconded abroad often faced demanding tasks that needed to be carried out in conditions that were strange to them. In addition to professional skills, successful performance in the job required sound physical and mental health.

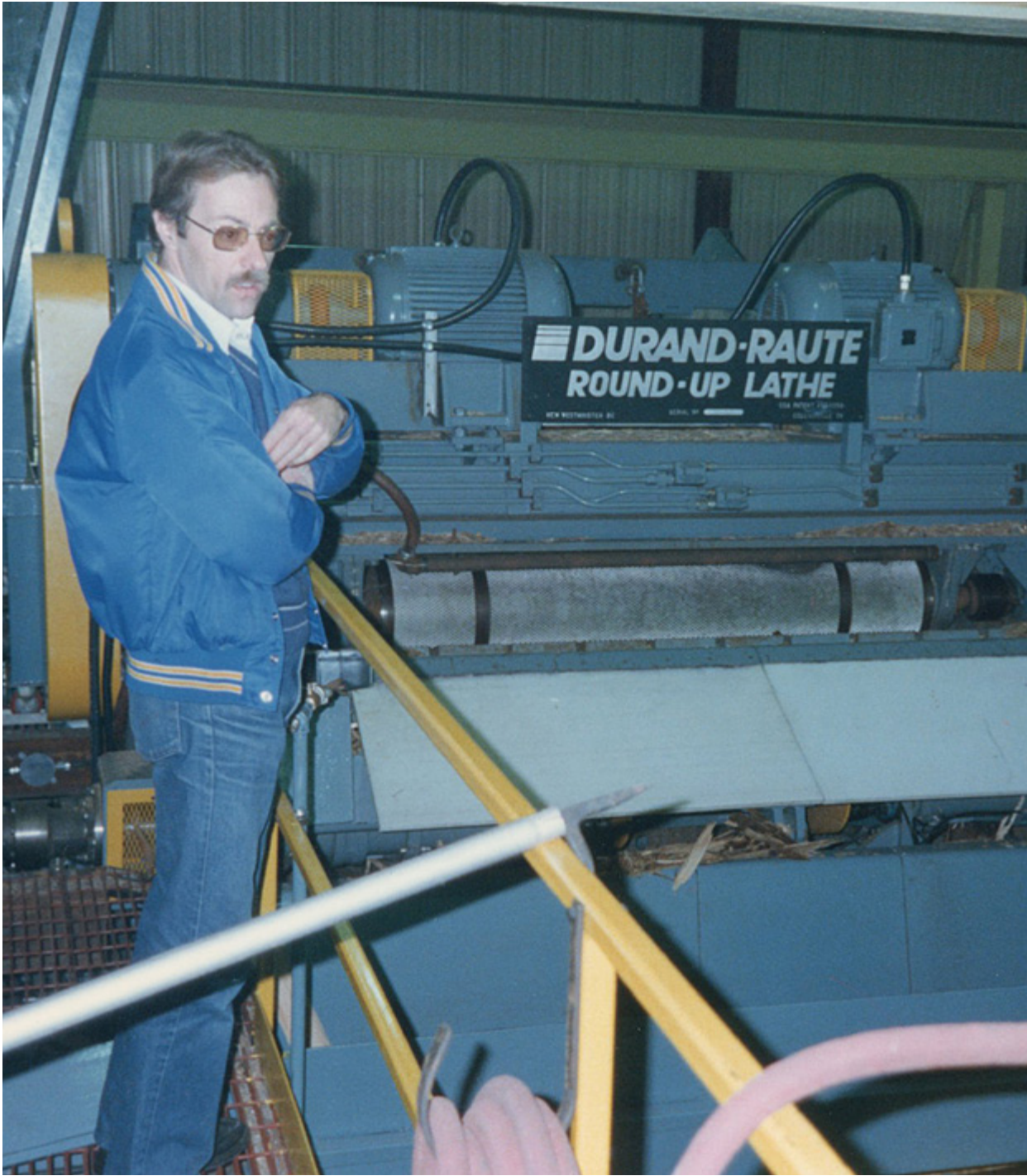
A SALES OFFICE IN THE UNITED STATES

In the 1970s, the United States and Canada accounted for approximately 40 percent of the entire world's plywood production and roughly 20 percent of its particle board production. Whereas Finland produced some 450,000 cubic meters of plywood a year, America produced roughly 24 million cubic meters of it in the same period. Plywood was used in the construction of the floors, walls and roofs of houses, and Lahden Rautateollisuus wanted a share of these markets.

The company entered the American market by setting up a sales office in Portland in 1974. Four years later, the sales office turned into a subsidiary named Raute Inc. and relocated to Atlanta. The reason behind the subsidiary's relocation was that the vast areas of planted pine in the Southern States were approaching maturity, the wood was cheap, and the labor was half as cheap as in the north. Everything also strongly indicated that all new plywood mills in the United States would in the future be built in the South.

Lahden Rautateollisuus's efforts to capture a share of the United States market relied especially on continuous lathe and drying lines and veneer jointing machinery, which were not made there. The machines were good, but the continent was wrong. In the United States, 95 percent of plywood mills made softwood plywood, whereas the machines of Lahden Rautateollisuus were made for a thinner veneer. It soon became clear that the Rau-te machines were unable to process thick veneer. The local industry's lukewarm attitude toward technical solutions approved in Europe also caused surprising problems. The company realized that if it wanted to be successful in America, it would need to provide more robust machinery and draw up another kind of strategy.

It therefore developed a veneer drying line which it successfully sold across the Southern States. This was not yet enough to make Raute Inc profitable, especially when the country's construction industry fell into recession. Only around a million houses were built, whereas at its peak, the industry had built 2 million houses a year. Plywood was not selling, factories were being closed and shut down, and machinery manufacturers were going belly-up. Raute Inc. managed to stay afloat thanks to its spare parts business, established for the purpose of servicing and maintenance.



Durand-Raute's rotary knife lathe.

“We mustn’t
give up at the
threshold of the
incipient upswing
but keep working
really hard.”

“The United States market is extensive, but once this recession eases, it’s probable that the first orders will be placed with a domestic producer (Coe Manufacturing Company),” said Kai Mustakallio, marketing director of Lahden Rautateollisuus Oy, in the newspaper Talouselämä in 1979 in a comment on the period that would follow the recession.

The United States economy began to recover gradually in the fall of 1980. *“We must not give up at the threshold of the incipient upswing, but keep working really hard. We should remind ourselves that if you can sell a product in America, it’ll be easy to sell all over the world,”* said Pentti Lahtinen, head of the Atlanta subsidiary, in an article he wrote for the personnel magazine in 1981.

MARKET LEADERSHIP WITH A CORPORATE ACQUISITION

Although business in North America had not proceeded without problems, the company was not ready to withdraw from the continent. It found itself in a situation in which it needed to develop machinery for the local tree species, close the subsidiary, or think of another way to penetrate the market.

“We made a two-week research trip to the States. Heikki (Mustakallio) had never been there, even though we’d had operations there for several years. We drove up and down the country and toured the local plywood mills. After the trip, we acknowledged that we couldn’t keep on doing what we’d been doing in the market. We’d either find a solution or pack it in,” says Pekka Leppänen, who took charge of the wood processing unit in 1981.

When they returned home, the men commissioned a study on the North American plywood market and the competitors there from the consulting and engineering firm Jaakko Pöyry Oy. The company’s management then selected five companies which it contacted. One of these five was the Canada-based Durand Machine Company Limited.

The acquisition was finalized in 1982 and the new company came to be called Durand-Raute. Durand had developed particularly technology suitable for the turning of softwood plywood, including a rounder, a spindleless peeling line, a rotating cutter and a stacker for wet veneer—precisely the machines that Lahden Rautateollisuus lacked.

In Canada,
Durand-Raute
rose to market
leadership as
the country’s only
plywood machine
producer.

One of Durand’s owners, Paul Carter, worked as the new company’s managing director for more than ten years. He played an important role in spreading competence in softwood plywood technology to the Nastola factory and in increasing Raute-Durand’s market share in the North American markets.

“Paul had good relations with the local clients, and Durand had developed entirely new technology for softwood plywood production. These helped Raute gain a foothold in North America. Little by little we gained a reputation as a good machine supplier,” says Leppänen.

Mikko Mustakallio, who worked as a product development director in Canada for three years, agrees: *“Penetrating the American market would have been considerably slower and more difficult without Durant. Our technology was Finland-oriented and driven by birch plywood. Durant provided the company with technology which allowed us to deliver entire lines anywhere in the world. The products of Raute and Durand complemented each other”*.

In Canada, Durand-Raute rose to market leadership as the country’s only plywood machine producer. In the USA, Durand-Raute held the country’s second largest market share. Over the first three years, Durand-Raute’s net sales grew from just under USD 10 million to more than USD 20 million. The subsidiary Raute Inc was merged into the new company.

Besides softwood plywood, the North American construction industry used the big-chipped oriented strand board (OSB) in place of plywood. The market for OSB was also expected to grow in other market areas, and Raute expanded its business to become an OSB supplier by acquiring the entire share capital of the Canada-based engineering firm and important machine supplier, Precision Service and Engineering (PS&E) Group, in 1995. The deal included PS&E Group’s four facilities. The PS&E Group acquisition was a strategic investment for Raute, one which enabled it to enter the growing OSB markets and expand its portfolio as a supplier for the mechanical forest industry. In 1996, the company established two companies called Raute Wood, one in Canada and the other in the United States. The business operations of Durand-Raute and PS&E were merged into these companies. The merger aimed to reduce the cost structure, improve customer service and facilitate the integration of the North American business into Raute Wood.

Raute phased out OSB altogether in 2004.

THE CHALLENGING AUSTRALIAN MARKET

Raute delivered its first machines for the Australian plywood industry in the early seventies. The continuous peeling and drying line delivered to the country represented the cutting edge of technology at the time and was the first veneer line implemented with entirely new machines in the country’s history. The next two new lines for Australia were bought in the early eighties, both from Raute, but years would pass between them and their subsequent delivery.

The challenge the company faced in the Australian market was the small mills there. While the mills were in dire need of new machines and new technology, they found investments in them difficult, given that the interests on loans were sky high—18–20 percent—and inflation was around 7 percent.

Another issue in the country that raised the stakes was forest conservation. Plywood production was primarily based on the use of planted pinewood forests owned by the Commonwealth of Australia. Australia had set enterprise-specific quotas on the available raw material and when the supply of raw material from natural forests petered out as a result of the actions of conservationists and trade unions, it limited the growth of production. Many small mills were forced to close shop.

Instead of plywood, laminated veneer lumber, or LVL, began gaining a foothold in Australia, largely due to the radiata pine, which made for an ideal LVL raw material. This species of pine grew at a prolific pace, and the use of LVL beams as a frame material for buildings increased. This suited Raute.

“The first LVL line was delivered to Australia as early as 1976. A company called Carter Holt Harvey bought from Lohja the pilot line that Raute had delivered there back in the day. They made three copies of it, and these four lines operated side by side until the 2000s,” says VP Jukka Siiriäinen, who worked in Asia for 30 years.

At some point, it seemed that Raute’s machines would lose market share to its competitors’ continuous LVL presses, suitable for the production of big volumes, but in the end, this did not happen.

“The strength of our competitors’ machines lay in particle board and MDF board. Their production is based on the processing of mass, whereas veneer production is the processing of pieces, given that each veneer is a separate piece. Continuous processes are susceptible to disruptions. You have to have the time to remove

Raute machines captured the market slowly but surely.

broken veneer from the line before the process goes ahead. This was impossible in production focusing on the processing of mass. Due to our skills, Raute's machines are built on veneer."

Raute machines captured the market slowly but surely.

HIGH TECH IN A NARROW PRODUCT SECTOR

The 1980s marked a time of strong growth and internationalization for Raute, but this did not come about easily. Due to the global recession, the company's sales to the Comecon (Council for Mutual Economic Assistance) countries important to it declined. This had a significant impact on the company, given that 80–90 percent of the Group's net sales derived from exports, and that the Soviet Union and Eastern bloc accounted for 20–50 percent of this share. The company therefore needed to reinforce its position in the Western markets to survive the declining Eastern trade. To this end, the company appointed a new marketing director and reshuffled its sales department country- and region-specifically. The goal was for the marketing personnel to be as familiar as possible with the language, culture and people of their respective areas.

"In other words, we need to enter an extensive market area with high tech and a narrow product sector," said vuorineuvos Heikki Mustakallio in the speech he gave on the occasion of the company's 75-year anniversary in 1983.

To mark the occasion, the company, one of the oldest in Lahti, had shortened its name to Raute Oy. Raute, which had been used as a trademark and a profit center name for a long time, was a better and more well-known name both at home and abroad. Some 60 percent of production on average was exported and Lahden Rautateollisuus was a difficult name for foreigners. The name also created a perception of the company as being engaged solely in the metal industry. The shorter name provided a better opportunity for developing the operations of all three profit centers— Raute, Lahden Vaaka and Sope. The new name's official adoption took place on September 26, 1983.

Each of the independent profit centers held a strong position in their respective industries, both at home and abroad. The Group now employed around 1,000 people and had net sales of approximately FIM 230 million. It exported products to nearly all continents, and the exports accounted for 60 percent of its sales. The company's most

The company's
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important export destinations were the Soviet Union (40%), the United States and South America (17%).

Raute began to internationalize the wood processing machinery unit especially strongly. Its sights were set, above all, on countries bordering the Pacific, including Malaysia, Indonesia, Singapore and the Philippines.

“In the future, it’s either global or nothing,” said Mustakallio in an interview he gave during the anniversary year.

The company’s order books were looking good and it was increasing its investments significantly. At the time, Raute’s Nastola factory was expanding its department that produced presses. The area of the future extension covered 1,200 square meters and its volume 16,600 cubic meters. The company had its own sales units in the United States and Ecuador and a subsidiary, Oy Infor Ab, in Nastola.

Lahden Vaaka had developed from the producer of individual scales it had been during the Group’s early years, into a supplier of larger lines. Alongside scales, its product range included computer-controlled batching and materials processing lines. In the anniversary year, the profit center’s net sales amounted to approximately FIM 40 million, of which exports accounted for 35–40 percent. It employed 160 people.

Sope, Finland’s fifth largest furniture maker, had production units in Lahti and Nastola. Its annual invoicing amounted to around FIM 40 million, of which exports accounted for roughly 35 percent. Most of the exports were destined for Scandinavia and Central Europe. Sope employed 250 people and was about to initiate an expansion of 2,000 square meters.

Raute’s order book filled out with FIM 100 million right at the beginning of 1984. The Florida-based Gang Nail Systems company commissioned a complete veneer beam factory from Raute, which also included a veneer drying line. This was the subsidiary’s first major deal. In addition, Europe’s second largest plywood mill Rougier Ocean Landex S.A. commissioned two veneer drying and sorting lines, to be delivered to France. An entire plywood mill with an annual production of 30,000 cubic meters was sold to Perm, in the Soviet Union.

MASSIVE DELIVERY TO TYUMEN

“Raute-Streif, Raute Oy’s marketing company for prefabricated wooden house factories established in Lahti, has made a plus FIM 200 million deal. The project is called Tura, and it covers the entire machinery and equipment for the timber house factory of the Tyumen forest and wood processing kombinat in Siberia,” enthused the personnel magazine Rautelainen in 1985.

And the enthusiasm was warranted, given that the deal was far from insignificant. The internal area of the commissioned factory hall was 15 hectares.

Raute securing the Tyumen deal was not a given. The Lahti-based Makron Oy was a strong supplier of machinery for home factories at the time. The Tyumen delivery was nevertheless so vast in scale that the kombinat’s chief executive wanted Raute-Streif to deliver it. Streif was a German supplier of prefabricated houses.

“Astrid (Vähä-Touru) and I were at a meeting in which we were asked to make an offer on a delivery of the machinery for a home factory. My answer was that unfortunately we did not possess the competence required for the project. The chief executive opened the door to the next room and said ‘You can find it here.’ The two men in the room were Misters Niemetz and Pesi of Streif,” says then managing director Pekka Leppänen.

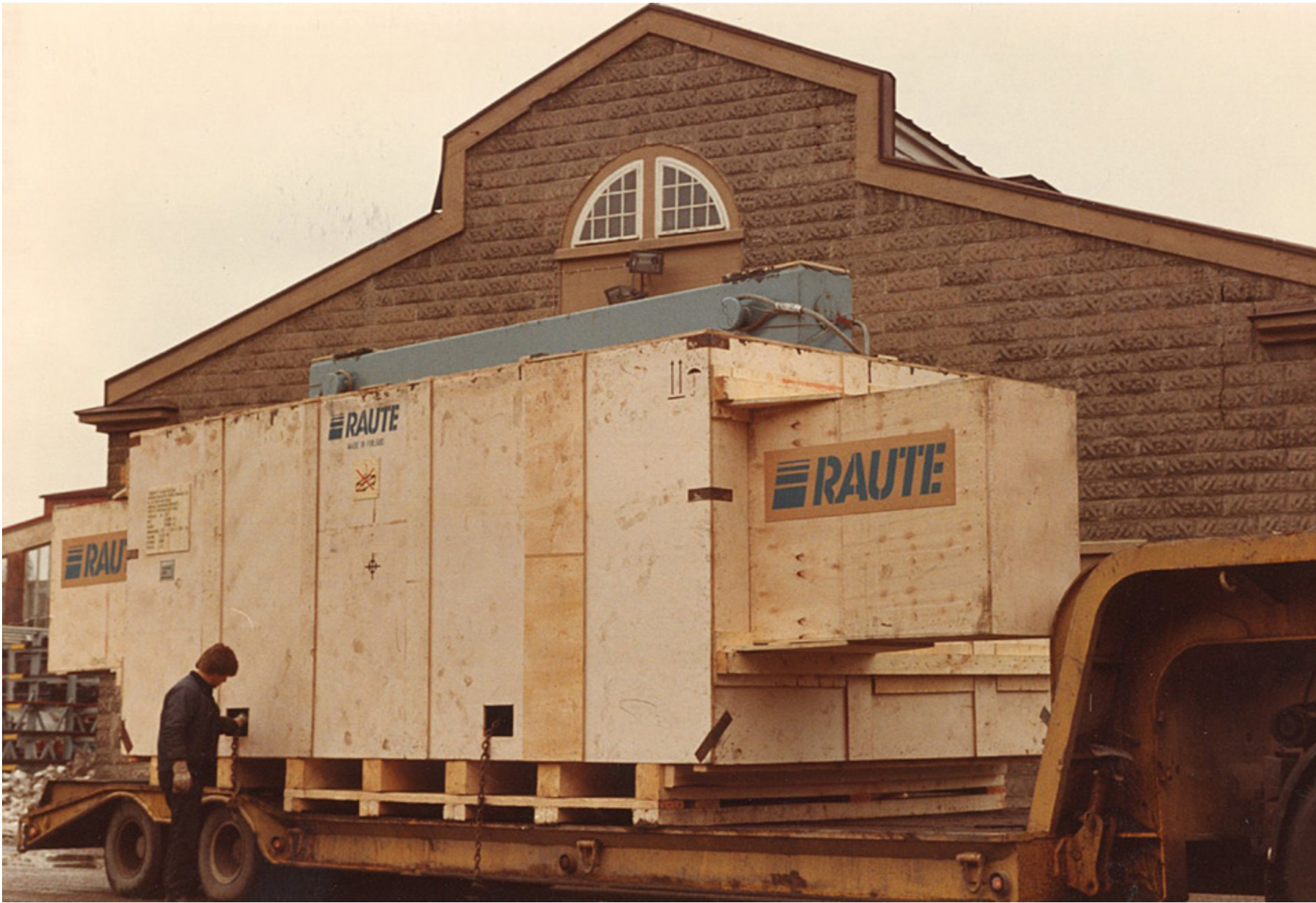
Raute transported more than 900 wagons of machinery to Tyumen between 1985 and 1986. The deal was also significant because it was the first Finnish delivery of an entire wooden house factory to the Soviet Union.

Raute-Streif was set up solely for the delivery of the Tyumen timber home factory. Once the delivery had been completed, the joint venture was dissolved.

AN OFFICE IN GERMANY

“In the future, it’s global or nothing,” said Heikki Mustakallio in an interview he gave when Raute was celebrating its 75th anniversary in 1983. The time had come to broaden the company’s horizons in Europe, in addition to the Soviet Union.

Raute has always boldly gone where there is a forest and plywood industry, and Germany had both. The country had a robust beech plywood



A Raute machine about to shipped to a client.
The photo was taken in the Lahti industrial block.

industry, and the market looked promising— so much so, in fact, that it was worth exploring on site. The company therefore got down to business and Raute GmbH opened its doors in 1988. The sales office in Germany also served as a base for activities in the markets of Italy and France.

Clients in Central and Southern Europe differed from those in the North. Europe had many family-owned mills which made veneer-based special products. The markets were dominated by local machine suppliers. In Germany, Raute competed primarily with Keller, and in Italy with Cremona.

“For some reason, Keller’s people did not seem to notice our entry into the German market before it was too late. As Raute began to win deals, Keller faded into the background until it finally went out of business,” says Timo Reinikainen, who worked in the sales company for a couple of years as technical support for Hans Weber.

With its reliable and good machines, Raute captured the European markets one deal at a time. Today, Europe is an important export destination for the company’s products. Raute has been the principal machinery supplier for several mills built in Europe in recent years and has also supplied machinery for mills undergoing modernization. The company has a wide network of representatives in Europe which knows its clients and takes care of business in more than a dozen languages.

In the past few years, European producers of sawn goods have invested in the production of laminated veneer lumber, which is why many of the mills constructed in recent years have been LVL, rather than plywood, mills.

“There are two basic reasons for this: LVL is stronger and of a more consistent quality, and LVL can be produced in larger dimensions than sawn wood. Thanks to these properties, LVL is ideal for the modern, comprehensively efficient structural concepts,” said technology manager Hannu Sinko on the reasons for LVLs popularity in a 2009 personnel magazine.

FIRST FINNISH-CHINESE JOINT VENTURE

Besides the West, Lahden Rautateollisuus was also gaining a firm foothold in Asia. The company had already sold wood processing industry machinery to China in the 1970s. In 1975, it delivered nearly FIM

In addition to the four plywood mills, the company had made several more deals with the Soviet Union.

10 million worth of mechanical wood industry machinery to the People’s Republic. In the early 1980s, it increased its export efforts by presenting its skills and expertise directly to Chinese clients, for example.

An inquiry by the Chinese concerning whether Raute would be willing to establish the first Sino-Finnish joint venture in 1984 initiated a series of negotiations: two years were spent on almost ten negotiations. The time that passed from the first contact until the commencement of the project itself spanned a little more than three years. When the agreements were finally concluded, a joint venture—composed of the Finnish Fund for Industrial Development Cooperation, the Bank of China, Qingdao & Consultancy Company, and Qingdao Industry Corporation, in addition to Raute—began constructing a plywood mill which would produce 31,000 cubic meters of plywood a year in the city of Qingdao. The mill’s main machinery was delivered by Raute.

“Few countries are able to assemble projects of this scale as expertly as Finns do. We’re in a good position even when compared to the Japanese,” said Pekka Leppänen in an article published in the journal Rakennustuotanto.

Leppänen deemed the cultural differences the most difficult area at the start of the cooperation; it took time to get onto the same wavelength, and everything needed to be learned the hard way.

THE MARKET CHANGES

In 1989, Raute’s personnel gathered together as usual just before Christmas to hear the management’s outlook on the following decade. In terms of the Eastern markets, the future looked bright. The previous year, Raute had sold four plywood mills to the East, and opened its own office in the premises of the Finnish-Soviet chamber of commerce in Moscow. In addition to the four plywood mills, the company had made several more deals with the Soviet Union. Raute had visited the Soviet Union to assess the needs of 15 plywood mills together with the country’s Forest Ministry. Furthermore, it was looking forward to tours of at least 18 mills—the Ministry having 93 plywood mills in all. Operations on site brought clarity to the cooperation.

In late 1990, the inauguration of the Finnish-Soviet joint venture Chudovo-RWS’s plywood mill was celebrated in a big way in Chudovo, Novgorod Oblast. Chudovo-RWS’s chief executive Igor Slutsker held

the welcoming speech for a sizeable group of dignitaries. Vuorineuvos Heikki Mustakallio gave a speech on behalf of Raute.

The Russian word “chudo” means a miracle, and some miracles did indeed take place on the plywood mill’s construction site. The Chudovo mill was built on a bare field, and on a tight schedule at that.

All the equipment, right down to the smallest parts, had to be shipped from Finland. If something was missing, you could only get your hands on it through trade-ins. But not everything was available even by such means. For example, the construction of the roof came to a halt when it was discovered that the roofing tar could not be heated because there were no tanks for it on site. The problem was solved with a telex sent to Finland and a guy from Lahti who got on the very next train to Chudovo, accompanied by four heating tanks. The roof was finished.

Despite the challenges, Raute was able to deliver the mill around two months ahead of schedule and in line with the budget. Chudovo-RWS’s deputy CEO Eero Höglund, who was responsible for the project on the Finnish side, said in a newspaper interview that he could not recall a single mill project, even in Finland, in which the costs would have exceeded the cost estimate by anything less than 50 percent. In this project, the budget was nevertheless exceeded by a mere 2 percent in terms of the currency-based contract work, while the costs in terms of the ruble-based contract remained below the budgeted level. No wonder, then, that spirits were running high during the inauguration.

Raute, which owned 15 percent of the joint venture, viewed the mill, which produced 50,000 cubic meters of birch plywood a year, as a significant reference for future deals, especially as the technology used in the mill and its level of automation represented state-of-the-art technology in birch plywood production. Another 15 percent was owned by Schauman Wood Oy, part of Kymmene, which was also tasked with selling the Chudovo plywood to global—mainly German and Austrian—clients. The first order had already been produced, and exportable plywood was expected to be churned out by the mill by the beginning of the following year. The rest, or 70 percent, of the company was owned by Novgorodlesprom, a forest industry consortium based in the Novgorod Oblast, and a Chudovo match factory referred to as *‘The Flag of the Proletariat’*.

However, by 1991, trade with the Soviet Union had taken a radical turn, setting entirely new requirements for Raute’s operations as well. Purchasing consortiums that competed with the existing purchasing

The barter trade system came to an end overnight. Raute had two mill deliveries in the yard of its Nastola factory awaiting departure for the Soviet Union.

organizations began to appear, including the Forest Ministry’s own foreign trade consortium, Exportles. In addition, the local companies began to hold foreign trade licenses and the representatives of mills took part in negotiations. Whereas before, one deal might have yielded up to dozens of orders at best, the trade was now being carried out according to the principles of Western trading. Furthermore, payments were made with an exchangeable currency rather than in the form of compensation deals as before, in which a production unit exported by Finland to the Soviet Union had been paid for in the form of that unit’s products, for example. The new method of trade translated into the handling of financing and collateral issues in a manner equivalent to that followed in Western trade deals.

The scarcity of the exchanged currency, the change in the decision-making system, and the unfamiliarity with financing issues made the market different. The magnitude of the change began gradually to take shape and become clear.

In January 1991, Kari Airaksinen, head of the Raute Wood Processing Machinery unit, put the company on a shoestring budget. In the personnel magazine’s editorial, he wrote as follows:

“What does this mean for us? It is no longer enough for the client to be willing to buy our products and for the price to be right. The financing and collateral aspects must also be in order... To secure deals, we must also be ready to develop solutions for our clients in financing and barter trade arrangements.”

Ultimately, the coup d’état attempt staged by hardline communists in August 1991, which led to the disintegration of the Soviet Union, changed everything. The barter trade system came to an end overnight. Raute had two mill deliveries in the yard of its Nastola factory awaiting departure for the Soviet Union— a particle board destined for Chelyabinsk and a plywood mill destined for Bratsk. Half of both mills had already been delivered, while the other halves were awaiting trains in Raute’s yard.

According to one story, the mills had already been loaded onto the cars of a train standing on the spur track and the train was waiting for the go ahead when word arrived that a payer beyond the border would not be found, and the cars were unloaded.

The value of the packaged machinery intended for the plywood and particle board mills which was left standing in the yard was FIM 76 million. It is hardly a surprise that Raute’s net sales declined by more than 40 percent in 1991.



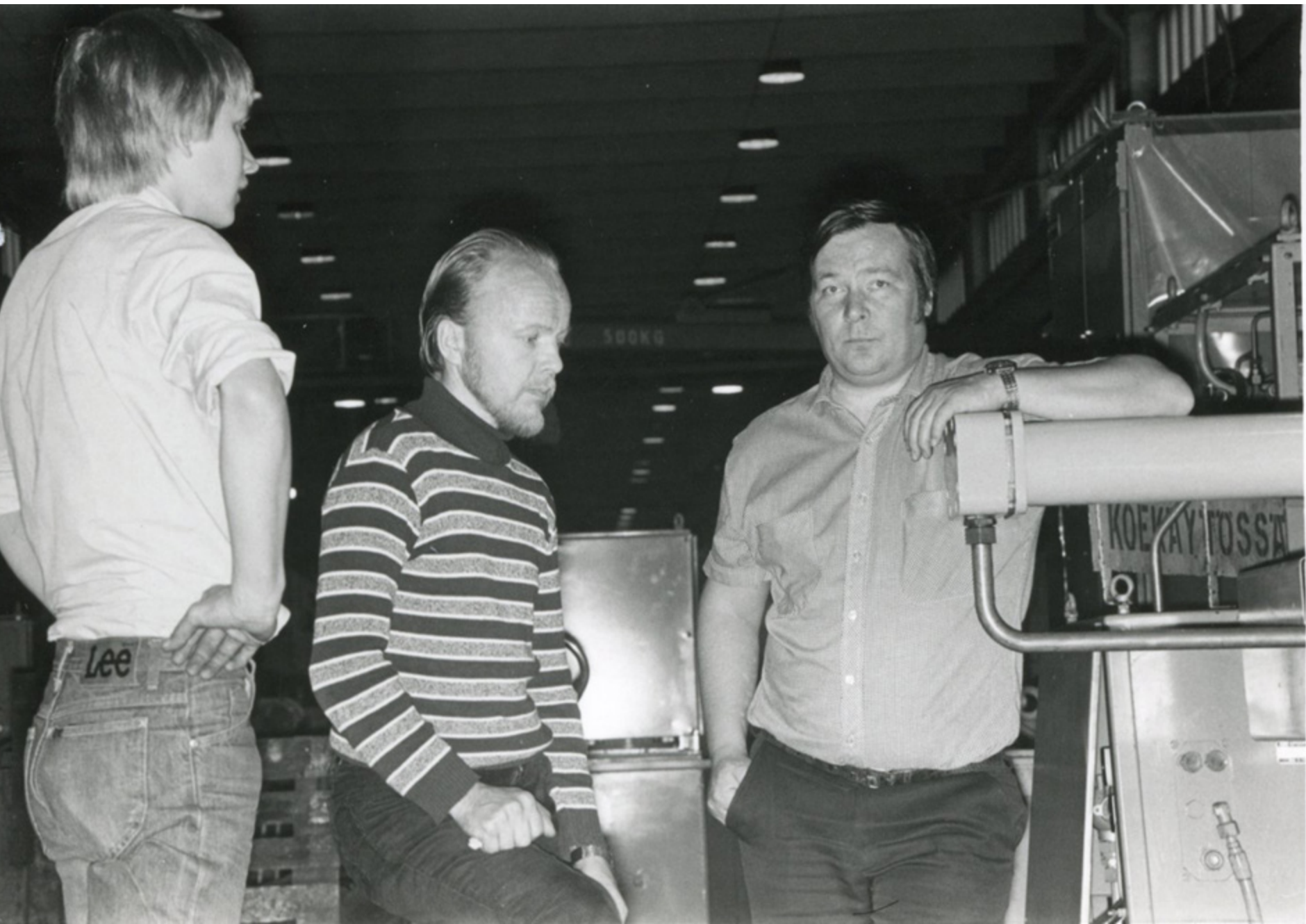
Timo Reinikainen, M.Sc. (Eng.), who retired in June 2020, worked at Raute during six different decades.

THE COLLAPSE OF THE SOVIET UNION

The deepest recession since Finland’s independence and the collapse of trade with the Soviet Union hit the metal and machine shop industry harder than most. Raute’s problems were further exacerbated by the slump of the forest industry in Western countries. During previous difficult times, Raute Precision Oy (formerly Lahden Vaaka) and the furniture maker Sope had balanced the company’s financial standing, but now the situation was different. All of Raute’s business areas plunged into difficulties at the same time.

Petri Strengell, then in charge of Raute’s investment projects related to production development, recalls how Kari Airaksinen, who had become the Group’s managing director in 1992, convened a meeting for the company’s key personnel. Airaksinen illustrated the company’s situation by drawing a line on a flip chart that depicted the catastrophic drop in the company’s net sales.

“It was a pretty chilling meeting. Kari pointed out to us where we were at the moment, and at what point we’d run out of money. First this stopped you cold; then it spurred you to action. The entire personnel worked as hard as they could. The machinery that had been left standing in the yard was realized and we managed to sell it off little by little.”



Timo Reinikainen (left), veneer lathe design engineer Jouko Tulokas, and photographer Jorma Siivonen, who photographed Raute machinery, testing Reinikainen's master's thesis work at Raute's Lahti factory in 1981. The veneer lathe in the photo was used to test the hydraulic feeding of the tool slide.

The year 1992 was one of the most difficult ones in Raute's history. *Net sales declined by 24 percent and remained at FIM 257 million. The company made a loss of more than FIM 60 million.*

"The following year, we were back on the right track, and by 1994, we were already close to normal in terms of our business operations," adds Strengell.

Raute was used to doing everything itself, and the workforce was dimensioned accordingly. The decline in the amount of work therefore affected them directly. To survive, the company was forced to lay people off, furlough them until further notice or for a fixed term, and everything in between, in addition to severe downsizing.

To a large extent, the collapse of trade with the Soviet Union also tanked Raute's markets in particle board machines. The use of continuous presses was becoming more widespread in the production of particle board, and Raute's product range did not include a press of this kind. Remaining in the particle board business would have required the company to make a substantial investment in product development at the same time as it was already investing in the product development on the plywood side of the business, in which it was looking for new markets. The company made a strategic decision to focus on plywood technology and to gradually phase out the production of particle board machines.

Besides troubles in the East, uncertainty in international economic development delayed the rewards that the company would gain from its investments in plywood technology in its other market areas. The company therefore enhanced its marketing particularly in Southeast Asia, where the economy continued to grow strongly despite the recession gripping other parts of the world.

Raute was reincorporated in 1992. The new company was made up of Raute Wood Processing Machinery Oy, Sope Interior Oy and Raute Precision Oy, as well as the Group's Finnish subsidiary RWS-Engineering Oy. RWS was a consulting firm founded by Raute Oy and Oy Wilh. Schauman Ab. Subsequently, it was transferred fully to Raute's ownership.

A decade would pass before Raute next engaged in trade with Russian counterparts.



Raute relocated a sales office from Jakarta to Singapore in the late 1980s. Singapore's more central location facilitated the management of markets throughout the APAC region.

THE FAMILY BUSINESS BECOMES
A LISTED COMPANY

Raute Oy listed on the Helsinki Stock Exchange in September 1994. The listing meant an increase in the financing options important for the company’s development and an improvement in its share’s liquidity. As a listed company, Raute also had increasingly better opportunities to operate in the international markets. Regardless of the listing, the Mustakallio (formerly Schwartzberg) family remained its chief shareholder. The listing went better than expected. Raute Oy offered 635,768 A series shares with a nominal value of FIM 10 to the market at a price of FIM 72 per share. Approximately 918,000 shares were subscribed within 36 hours. Raute’s Board of Directors suspended the share issue due to oversubscription.

“We were expecting the issue to be well received, but for it to be oversubscribed by noon the second day was definitely a surprise,” said then President and CEO Kari Airaksinen, commenting on the issue to the newspaper Etelä-Suomen Sanomat.

That same year, Raute divested Sope Interior Oy. Letting go of the loss-making furniture business and focusing on the Group’s principal business areas—wood processing machinery and scales—was an important strategic decision. The company was now increasingly clearly a supplier of industrial processes, which also made the key machinery required by the processes. Raute had risen to a leading position as a supplier of plywood industry production systems and the plate glass industry’s raw material facilities. It was the market leader in both its business areas in Finland and was pursuing growth abroad.

THE SHIFT OF RAW MATERIAL TO PLANTED
FORESTS OPENED NEW MARKETS

Raute had sought to increase its market share in the world’s fastest growing area in Southeast Asia even before the dissolution of the Soviet Union by opening a sales office in Singapore in 1983. In the early years, Indonesia was the main market area in Southeast Asia. At its best, the company had two offices there, one of which was in Jakarta. Being close to the clients gave the company the opportunity to provide premium services starting from the bidding stage and

“We hit the competition with rapid product development sprints. We were adapting our existing products to the Asian market.”

extending all the way to the delivery and after-sale servicing.

“Nearly all of Raute’s clients had an office in Jakarta, but the mills themselves were in the same place as the raw material, or in the rainforest. Around half the clients were in places inaccessible by road. So first we drove to the nearest city or town, from where we continued to the client’s location along a river,” says then Deputy CEO Jukka Siiriäinen, who relocated from Nastola to Singapore in 1991.

In addition to the road network, all the other infrastructure was in its infancy. For example, with telephone connections, you first called from your hotel to the hotel switchboard, which then called an international switchboard, which in turn called a Finnish switchboard. On average, one call out of every 16 went through all the way to the intended recipient.

But the products were in high demand, and deals were made.

In the 1980s, 1990s and even at the beginning of the 2000s, tropical rainforests were being cut down in Asia. The trees, whose diameter was easily more than a meter, were unsuitable for the machines made in Nastola. The situation changed when countries in Southeast Asia began using planted trees as raw material due to increasing shortages in the availability of tropical wood. This caused mills to begin investing in small-wood technology.

The machines of Lahden Rautateollisuus, designed for Finnish birch with a small diameter, were perfect for the planted trees. The machines’ design accounted for the optimized utilization of the raw material, and above all in making the heartwood, or peeler core, as small as possible. This was achieved with double spindles and a veneer lathe equipped with a block charging device. The time loss attributable to the use of small wood had been minimized by the development of various transfer and sorting machinery and automated production lines.

“The planted forests opened entirely new markets for Raute and allowed us to bring a substantially broader product range to the markets,” says Siiriäinen.

“We hit the competition with rapid product development sprints. We were adapting our existing products to the Asian market,” adds Petri Strengell, currently VP, COO, who worked as a chief design engineer at the time.

Even though the market was good, the journey was not easy.

The product range alone was not enough. The company gained a strong position in many products and penetrated the markets quite well, but the products’ suitability for Asian plywood production caused problems. Raute had no previous experience in producing plywood from tropical wood, and had to learn things the hard way in some of the product development projects.

The company’s toughest competitors were the Japanese, who had dominated the Asian markets for years.

“The lathes made by the Japanese were suitable for the massive tropical trees. In addition, the general trading companies in Japan were able to engage in merchanting, meaning they were able to deliver machinery practically for free and take plywood as payment. We had to look for narrower market segments with which to create value for our clients,” says Siiriäinen.

Raute’s strong skills in the birch process was one such significant value added. The technology, originally developed for birch plywood, was well suited for the cylindrical and small rubber tree. Another strength lay in a Finnish specialty, plywood coating. On a coating line, impregnated films are spread on the plywood and then hot pressed so that the adhesive melts and sinks in the plywood. Coated plywood can be used up to a hundred times before it reaches the end of its own life cycle.

“The clients knew that we could offer expertise in addition to good machines,” says Jukka Siiriäinen, referring to RWS-Engineering Oy. Every processing line purchased from Raute was accompanied by an instructor from RWS, who for at least six months taught the client how to use the line.

RWS-Engineering Oy was a joint venture of Schauman and Raute which provided forest industry consulting services. Raute owned 60 percent and Schauman 40 percent of the joint venture. The new company focused on the export markets. The consulting covered the overall process of the mechanical forest industry, from forest to engineered wood product.

“The joint venture meant a great deal to Raute. It allowed us to disseminate our know-how on plywood production around the world,” says Pekka Leppänen, RWS-Engineering’s CEO from 1985 to 1992.

RWS-Engineering deepened the longstanding cooperation between Raute and Schauman Wood.

EVERYTHING HAD TO BE CARRIED ALONG

In the early years, the exports to Asia included everything from expertise to the goods and human resources.

Mika Hyysti, Raute’s current EVP, CTO, who joined the company in 1990 as an automation engineer, says that leaving for a project required meticulous planning and big suitcases. The mills were in challenging places and could not be expected to have phones. Even fax machines could be considered a luxury.

“We had suitcases bursting at the seams and kilos upon kilos of overweight. If you forgot something, you needed to get creative.”

The different culture in Asia was also a source of occasional challenges. Everything had to be learned the hard way, from an appreciation of the culture to adapting to the new market. Deputy CEO Siiriäinen says that the adaptation consisted of manufacturing products for a client’s needs, *rather than telling them, “This is what we have to offer—buy this”*.

The adaptation to the Asian markets also had a material impact on Mika Hyysti’s job description. Raute decided to discontinue the production of its own Raute RIC-85 control system in favor of commercial logics. Although RIC-85 was a good and functional control logic, some of its components were hopelessly outdated, and it would have had to have been modernized. The company added up the pros and cons of its own logic and arrived at the conclusion that, in relation to the volume, it no longer made sense to maintain and build a logic of its own.

“The scales tipped in the direction of Raute focusing on the building of machines and leaving the design of logics to the professionals of that industry,” says Hyysti, looking back at the decision.

Raute RIC-85 was replaced by Omron’s logic. However, the company failed to grasp beforehand the vast amount of work that the migration of the logic from one system to another would entail. Nor had it internalized what the new control system could and could not do. Simultaneously, business in Asia boomed and machines were sold to several mills.

“We had a huge number of projects in which we had to supplement the commercial logic with in-house PC-based programming. The problem was that we didn’t have nearly enough people skilled in programming.”

In 1994, Mika Hyysti relocated to Indonesia for a year.

At the time, Raute was a pure project house. This meant that every line sold was customized to the client from beginning to end. It could include

parts similar to another model, but something new was programmed into each line.

“Sometimes it was so busy that, during the day, I was visiting a client who was about to deploy a lathe line, and in the evening I was coding the software for the next project in my hotel room,” says Hyysti. He traveled from one place and country to the next, solving the problems of clients unaccustomed to high technology.

Thanks to the good outlook in Southeast Asia’s mechanical wood processing industry, the Singapore office was reinforced with two sales managers and a subcontracting and servicing manager in 1991. The sales office was incorporated in 1994 and the new company came to be called Raute (Singapore) PTE LTD. That same year, the company came full circle in a way, as Raute returned to Southeast Asia’s largest forest industry country, Indonesia. Customer service was strengthened by setting up a joint Raute and RWS sales and servicing office in Jakarta.

THE MARKET EXPANDS TO SOUTH AMERICA

RWS’s role was material in Raute’s first deliveries to South America. The same happened on this continent as in Southeast Asia: raw wood was replaced by well-managed planted forests. Thanks to good forestry and a climate favorable to the growth of trees, raw material of a good quality, like pine and eucalyptus species, was available for the plywood industry, and in abundance at that. The best application for pruned pine was the production of high-quality plywood. The strengths of South America’s plywood industry also included reasonable labor costs.

Given that plywood production on the continent started from scratch, the inclusion of RWS’s plywood experts in the roll-out of new mill projects was of material importance.

“We had a major plywood project underway somewhere in South America throughout the 2000s. When one was being started up, a new one was already on the drawing boards,” says Timo Reinikainen, who worked in Chile for 20 years as head of the South American market area.

Whereas plywood in Brazil was made with local machines, producers in Chile wanted the best. Raute Wood had been preparing a deal with the Chilean Celulosa Arauco company for a couple of years. Initially, RWS-Engineering had sold the Chilean company a feasibility study, in which it told the report’s commissioner what it should do with the wood reserves. RWS later also assisted Arauco in drawing up the call for tenders.

The smoothly implemented mill projects increased clients' trust in Raute.

"I remember a big group of us at Raute preparing for a visit to Arauco for the final negotiation related to the deal. A few days before we were supposed to depart, the client sent us a fax in which they said that there was no need for us to come because they had received a good offer from Japan. The Japanese had promised to buy plywood from Arauco for a period of five years, after which the machines would have been paid for. I replied by asking them weren't they supposed to make money with the machines, and that we'd be coming regardless," says Reinikainen with a laugh.

Before the meeting, some twenty people from Raute sat down with Reinikainen to think about a hundred reasons for buying from Raute. The sales pitch given to Arauco was based on these arguments. And the deal was won. Arauco bought a full softwood plywood mill from Raute. The delivery consisted of 18 subprojects, and its value was EUR 75 million.

It was a good deal for both parties.

Arauco, which is now one of Raute's largest and most longstanding clients, got the best machines on the market. And Raute gained an excellent reference. The mill was expanded the first time only three years later. Three years after that, Arauco commissioned the construction of the largest plywood mill ever at the time. All the machines always contained Raute's latest technology.

"Previously, we always came to Finland with South American clients to see the kind of technology the mills here used. Thanks to the project in Chile, the tables turned so that the Europeans and North Americans came to Chile. Individual new lines existed elsewhere as well, but the Chileans could provide an entire showroom."

The smoothly implemented mill projects increased clients' trust in Raute and its people. When the negotiations of a new transaction started, most of the sales work had already been done.

Raute's largest single order since Soviet times was the plywood mill sold to CMPC in Chile. The mill's production capacity was 250,000 m³ and the project was delivered in three phases. CMPC was Chile's other forest industry giant, in addition to Arauco.

The growth of Chile's plywood industry was based on the wood raw material which was well suited for plywood production. A vast majority of the planted pine forests had been pruned to a height of six meters. The pruned part of the trees yielded knotless face veneer.

The business in Brazil did not get off to as smooth a start. In Brazil, plywood is produced with simple local machines in hundreds of small mills.

Raute’s initial strategy was to focus on the five largest ones. It worked. Deals were made, but only on machines which contained automation that genuinely benefited the client, such as Mecano products. Mecano is a company that specializes in computer vision technology and measuring devices, like hygrosopic moisture meters. Raute acquired it in 2005.

“Mecano’s products have introduced intelligence to the blue hardware. Computer vision has allowed us to raise automation and digitalization to a wholly new level. With machines alone we’d never be where we are today,” says Deputy CEO Jukka Siiriäinen.

SECOND-GENERATION CLIENTS

Besides high-tech and automation, Raute’s success around the world is based on its being a technology partner to its clients. Particularly the company’s clients in South America have, as newly established plywood makers, valued Raute’s expertise and service. The quintessential Finnish honesty, perseverance and expertise have also served the company well.

“We may speak a somewhat funny broken English and be a little awkward, but the uncomplicated honesty and expertise that are the basis of long-term and confidential customer relationships have helped us forge good customer relationships,” says Siiriäinen. By expertise, he is referring to identifying a client’s needs. It requires skill to provide clients with added value in addition to mere machines and it is precisely this that Raute’s long-standing customer accounts are based on, both at home and abroad. Especially in Asia, the company is already working with the second generation of clients at many companies.

“When I started my career, the clients were business men who trusted the recommendations of their buddies. They didn’t walk into banks to ask for loans but took the money they needed for the deals from the cash office. Once these industrialists had their family finances in shape, they sent their children abroad to school. This brought about Asia’s new, modern generation of business men and women, which runs operations today. But the final word still often comes from the mother or father, depending on who sits on the coffer.”

RAUTE MAKES GOOD MACHINES

Following its robust start, Raute had high expectations of Asia, but they failed to materialize. The investment capacity of the companies in Asia plummeted



Raute Oy's industrial area in the center of Lahti in 1989. Photo: Veikko Kunnas

and the market has been quiet throughout almost all of the 2000s.

EVP, CTO, Mika Hyysti says that the problem was the raw material. Although there were forests upon forests of it, the vast majority of it was tropical wood. Many Asian countries initiated the protection of the slow-growth tropical forests in the early 2000s. This meant large-scale bans on felling.

The planted forests could replace only a fraction of the raw material need, which resulted in prices going through the roof. The increase in raw material prices, in turn, made the mills’ operations unprofitable. The machines were not maintained and there was no money for spare parts. When the machines stopped, they were replaced by cheap Chinese machines.

“China has small, manual and insanely cheap lathes for turning small pieces of wood. The wood is dried by the sides of fields before it is made into plywood.”

Deputy CEO Siiriäinen adds that Raute has retained contact with all its Asian clients still in operation.

“Most of the machines delivered to the mainland are still in operation and thanks to maintenance, they will remain in operation for years to come.”

Raute has always made good machines.



STORIES FROM RAUTE

NEW PHILOSOPHY AND CORPORATE CULTURE

In many ways, the 1990s was a decade of upheavals. Due to the collapse of trade with the Soviet Union, Raute's net sales plummeted first by 50 percent, and then by another 50 percent the next year. The organization went through a whirlwind of changes, simply to make it through the worst. References to the spring, summer and fall organizations made their way into conversations.

"First we set up a product category organization, which included plywood, particle board, sawn wood, and parquet. But this was soon abandoned and replaced by a product factory organization, in which the operations and people were divided into particle board factories and plywood mills. But this organization was also quickly abandoned, because there was very little particle board business and the operations were combined," says Timo Reinikainen (M.Sc. (Eng.)), looking back at the tumultuous years.

"Finland was in dire straits. The Finnish markka was overvalued, and therefore floated. We had to lighten our cost structure to keep our products competitive,"

The first Intel microcomputers at Raute.

Particle board faded, and there was no wish in the company to return to it.

says Mikko Mustakallio (Ph.D. (Eng.)), who had returned from Canada to head Raute Wood.

Due to the decline in sales, the company’s operations were reorganized. The changes strongly emphasized increasing sales and aimed to remove any overlap. The product factory organization was dissolved and production-related operations were relocated from the Lahti factory to Nastola. Operations at the Villähti factory were suspended until further notice and the operations were centralized instead in Uusikylä. The installation, deployment and spare parts services were integrated into the rest of the organization and the sales office in Germany was closed.

The adjustment efforts also had a significant impact on the personnel, with 64 production workers and 33 office workers laid off during the financial year. Another 130 people were furloughed until further notice. From July until December, everyone worked a shortened workweek.

“It was a tough spot for a young guy,” says Mustakallio. He and his team spent weeks on end examining budgets and modeling various future scenarios in light of the figures—what was absolutely necessary and what the company could do without.

“Product development was out of bounds, though, because we didn’t want to do away with our core competence.”

Particle board faded, and the company had no will to return to it. The technology had changed, and the company would have had to make substantial investments in the new technology if it was to hold its own on the market.

But while the particle board business subsided, softwood plywood was on the rise. Raute Wood’s technology was Finland- and birch plywood-driven, but Durand was producing global hit products such as the rotating veneer cutter.

“We moved Durand’s softwood plywood technology from North America to Finland, thereby expanding Raute’s repertoire. Returning production to the black would have been materially slower and more difficult without it,” adds Mustakallio.

A UNIFIED RAUTE

The new future also required a new kind of organization. Up to this point, Durand-Raute and Raute had been treated as separate

companies, even though the acquisition had occurred years before. Timo Reinikainen, who was then in charge of the plywood team, recalls that, for a long time, Durand-Raute had not really been part of Raute Wood Processing Machinery but was in essence another company entirely. Sometimes it even felt more like a competitor than part of the same group of companies.

“Mikko gathered together people from Marketing, RWS, Singapore, Canada and Nastola, and formed a team tasked with building a unified Raute. It changed everything.”

This GMT, or Group Management Team, established an entirely new philosophy and corporate culture in the company. The Durand brand was phased out and all its operations were now carried out under the name Raute. In addition to bringing about a unified working culture and business, it also increased efficiency.

“Previously, product development and marketing in Canada and Finland had been working on the same things. This overlap was eliminated,” says Mustakallio.

The GMT’s goal was to form a unified vision, but so the operations accounted for local conditions.

“Initially, we were in very different settings. The operations in Finland had for years worked with systems different than those used in Canada, for example. Despite this, we found a lot in common in investments, measuring, production development, systems, tools and our way of working,” says Reinikainen.

In 2009, the personnel magazine Sisäkara wrote as follows on the issue:

“For clients, a unified Raute translates into added value in the form of better services and a better understood needs-based range of products and services. For Raute, it means improved competitiveness and growth opportunities, and thereby better profitability.”



STORIES OF PRODUCT DEVELOPMENT

THE WORLD'S BEST VENEER LATHE DESIGN ENGINEERS

Raute's first separate product development department was set up in 1983. While the company had, of course, engaged in product development before this, it had been carried out at the product design department in the context of client projects. Traditionally, a buyer had expressed their wishes in connection with a deal, which the company then tried to fulfill on a drawing board. This marked the first time client work and product development were separated.

"Product development at Raute had remained in the shadow of client projects. Because of project deliveries, every machine was a prototype and the profit margins remained slim. The Board had even discussed the possibility of reducing the amount of deals made in Finland. Heikki pointed out that the profit margins were insufficient because the mill managers constantly got involved in the design of their own machines. This complicated operations. We needed to get the product development back into our own hands," says Pekka Leppänen, then managing director.

The first product development department was led by Matti Paakki and its first employee was Timo Reinikainen, who had joined Raute in 1979 with the intention of finishing his master's thesis there.

Matti Paakki was a good and encouraging supervisor. He toured the United States a lot, getting to know the competition. Whenever he returned, he drew what he had seen abroad for the young engineers.

"Matti encouraged us by saying that you guys are the world's best veneer lathe design engineers, and if you aren't yet, you must become them."

“Matti encouraged us by saying that you guys are the world’s best veneer lathe design engineers, and if you aren’t yet, you must become them,” says Reinikainen, as he looks back.

Paakki’s faith in the young engineers rubbed off and this was visible in the products developed or improved in the 1980s, including the block or XY centering analyzer. Paakki’s original version of the centering device developed in the 1960s was used to develop an automated version relying on laser technology in the 1980s. Assisted by a computer, the XY centering analyzer measured the wood’s shape and calculated the location of the largest cylinder within the wood. Once this had been established, the block was placed accordingly in the lathe and the production yielded a greater number of whole veneer sheets. The laser centering device increased the wood’s recovery by up to 15 percent. This had enormous significance for the wood’s recovery, and it impacted the entire plywood production process. It also enhanced production. Given that the process was carried out automatically, it required less manual labor.

Today, the block centering analyzer uses fanned laser modules instead of point lasers, and the recovery has continued to improve by another few percentage points.

OWN LATHE

While Raute possessed the rotary cutter and stacker needed for the production of softwood plywood thanks to its acquisition of Durand, it still lacked an 8-foot lathe.

The lathe market in the United States was dominated by the American company Coe. Europe’s large softwood plywood mills, such as Rolpin in France and Vänerply in Sweden, also had Coe lathes. If Raute wanted to capture a share of the softwood plywood markets, it would have to develop its own lathe.

“We began developing the new lathe series, starting with a clean slate. We put to use our in-house knowledge of previous lathe development projects and Matti visited the States to take a look at the competitors’ machines. Based on this, we developed new features for the Raute lathe, including a driving support device and a rotating counter blade. Thanks to them, the capacity of the lathe line increased, the veneer’s quality improved and the diameter of the remaining peeler core reduced when turning softwood plywood.”



Chief design engineer Matti Paakki had a significant influence at Raute, particularly in the 1980s. Clients came to call him Professor Paakki. As a brilliant drafter, he always drew clients a picture of what their production line would look like.

Raute’s lathe also included more durable structures and better automation controls than its competitors’ lathes.

The automation department of Lahden Vaaka had developed the Raute RIC-85 control system which, according to Reinikainen, was superior to all off-the-shelf programmable logics. This—combined with the 8-foot lathe and the in-every-respect superior rotary cutter the company possessed due to the Durand acquisition—opened new doors and markets for the company in South America, for example, where the use of tropical hardwood had almost entirely ceased.

After three years in the making, the first 8-foot lathes of the new lathe series were shipped to Indonesia and South Korea. These were followed by Finland’s first softwood plywood mills, located in Pellos and Suolahti.

Raute’s lathe successfully brought together the North American high production capacity and the high-quality of the veneer, which the company had learned to produce in connection with birch plywood. The new modular lathe series replaced all the older lathe models.

“Let’s aim for a free, creative and positive mindset. We tend to judge new things from behind mental roadblocks like ‘Well this is an old idea’ [...] But that’s irrelevant if it’s good for the here and now,” wrote Paakki on the topic of product development in an old personnel magazine.

That same free, creative and positive attitude still prevails in the company’s product development.



TEST FACILITY ENHANCED PRODUCT DEVELOPMENT

Internationalization made it clear that Raute needed to increase its investment in research in addition to product development.

To this end, the company established a test facility in Nastola in the spring of 1985. The facility tested the prototypes of new machines and lines before marketing them. It also tested the machines to be delivered to clients and their combinations with the client's wood grades and end products. Until the test facility's completion, the equipment and machinery had been tested at the company's own factory alongside other production, while the lines had been tested in clients' premises.

"Up to this point, Raute had been a machine merchant selling lathes, driers and presses. Now we began selling turning, dryer lines and presser lines, with stacking. We decided to begin by doubling the capacity of the lathe line," says Pekka Leppänen, who was then in charge of the Raute unit.

This was achieved when the hydraulic lathe developed by Mikko Mustakallio as his master's thesis work was

Coupled with the technology supplied by Durand, the test facility helped Raute develop a significant amount of new technology and opened markets for it in Asia.

“The clients were
bowled over.
We were able to
offer them an
entire lathe line
which stacked the
veneers directly
into different
grade categories.”

completed and doubled the speed of the veneer line. Thanks to the increased speed, the company’s own Raute Rics logic, and the matrix cameras, veneers could be cut and stacked according to different grades.

“Cameras, computer vision and laser measuring gauged the quality of the veneer and the shape of the wood blocks throughout the machining phase,” says Leppänen.

Raute developed the line in the test facility, tested it and eliminated all teething problems before asking clients to come see the finished line.

“The clients were bowled over. We were able to offer them an entire lathe line which stacked the veneers directly into different grade categories. It was the start of a strong cycle. We sold the lathe lines to one plywood mill after another.”

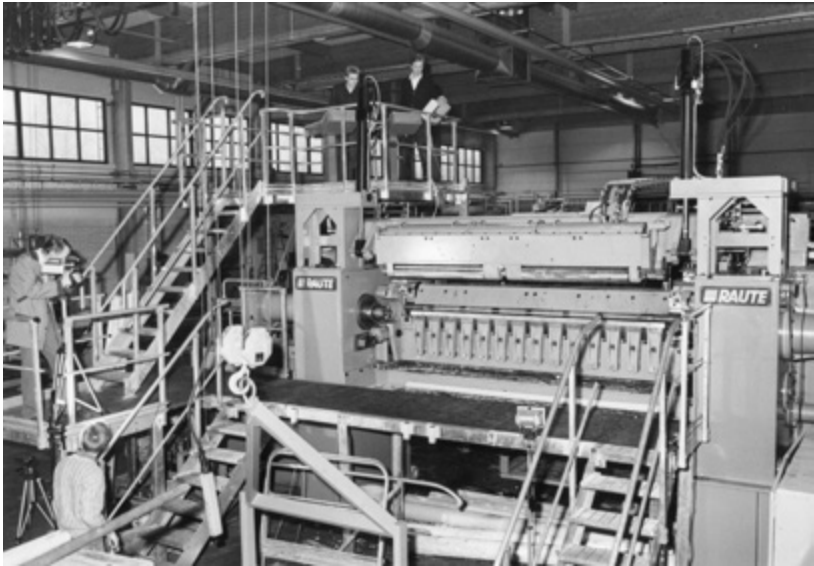
The new test facility allowed Raute to accelerate the pace of product development. Now it had the opportunity to use its own facility to test riskier equipment with a higher degree of innovation. This applied both to sold projects and the company’s own product development targets. It enabled the company to improve the lines’ technical reliability and production capacity.

“Around that time, we also began to hold systematic product development meetings with Schaumann Wood and Metsäliitto. Plywood production was manually intensive work and we wanted to know where the clients’ bottlenecks were and where they wished to see improvements.”

Leppänen adds that once one part of a line had been automated, the next phase also needed to be automated. *“When we doubled the capacity of the first line, we also needed to broaden all the other lines so that the capacity could be put to use. So we proceeded in phases that way.”*

The new test facility continuously housed lathe equipment representing the cutting edge of technology. The lathe/block centering analyzer combination and its advantages were described as follows in an old advertisement: *“Whereas the diameter of the core generated as waste in turning is normally around 70 millimeters, the lathe developed by Raute leaves behind a 50-millimeter core. The camera and laser equipment measures the exact dimensions of the log fed into the process, while a computer measures the log’s optimum cutter location which allows the user to achieve the best possible utilization of the wood.”*

The interior of Raute's test facility in 1990. Photo: Tapio Strandberg



The investment in the test facility amounted to FIM 5 million. In 1985, product development accounted for 3 percent of the Raute unit’s net sales. This was 2 percent more than the average for metal industry companies. Machines are not made without skilled people. When Pekka Leppänen joined Raute, Matti Paakki was the chief design engineer, Olli Hakanen the deputy chief design engineer and Raimo Seppälä the production manager.

“I quickly realized that Matti’s strengths lay in product development, so he was made head of product development, while Olli became the chief design engineer, and Raimo continued to head production. Once we had the right people in the right places, things started to happen.”

Leppänen adds that Reijo Kaunisto, head of sales in Finland, was a key individual in the development of Finland’s plywood industry. As a technically skilled person with a knack for good client contacts, he generated significant growth in the company’s Finnish sales in cooperation with Matti Paakki.



PROFILE

TAKING OVER AS MANAGER IN A FAMILY BUSINESS

When vuorineuvos Heikki Mustakallio became full-time chair of the Board of Directors in 1985, the company hired its first managing director from outside the family since Edvin Kauppinen. The person taking over the reins was Pekka Leppänen (M. Sc. (Eng.)).

“The task is challenging. But the spirit between the owners and the operating personnel at Raute is so good that a professional manager feels like part of the family,” said Leppänen in an interview with the newspaper Helsingin Sanomat in January 1985.

Raute was no stranger to the new managing director. He had joined the company in 1981, when he returned from Brazil, where he had worked in paper machine tasks for Valmet. In his first job at Raute, he headed the Raute profit center, known as an exporter of mechanical wood processing machinery.

“When I began working at Raute, 80 to 90 percent of our exports went to Russia, while the remaining 20 percent consisted of deliveries to Finnish plywood mills and the odd project delivered to clients in Western markets. My job was to take Raute to the West.”

Leppänen was the fourth person in the company to speak English.

Pekka Leppänen

Raute Oy's managing director, 1985–1992 and member of the Board of Directors, 1991–1992.

It was under
Leppänen’s
leadership that
Raute began to
invest significantly
in product
development.
The Raute
Research test
facility was
established
in Nastola.

“I called Erkki Rautiainen, who was working for Wärtsilä in Brazil at the time, and told him we needed a guy for international marketing in Lahti. Erkki took me up on my offer, and we gained more language skills and were able to reinforce our marketing.”

The business also gained an entirely new generation of people with fresh insights and a head for languages by way of students working on their master’s theses and diplomas.

When Raute acquired the Canada-based Durand, Rautiainen was appointed deputy managing director of the new company. The acquisition was based on Leppänen transferring personnel from Canada to Lahti and correspondingly, Raute employees from Lahti to Canada. This facilitated the alignment of the different cultures and expertise.

It was under Leppänen’s leadership that Raute began to invest significantly in product development. Raute Research, the first private research institution in the wood processing industry, was established in Nastola. Its core task was to improve the efficiency of wood use and increase mills’ production power and efficiency.

“We automated the plywood industry in the eighties one line at a time, aided by the Raute Rics logic developed by Lahden Vaaka. We developed the lines, tested them at the test facility, and ensured that any teething problems in them had been eliminated before we offered them to clients.”

The automation increased efficiency throughout the industry. Leppänen notes that Finland’s plywood production in the early 1980s amounted to nearly 400,000 cubic meters, and the 1 million cubic meter mark was crossed in 1999.

The cycle of good events this started was the sum of many things. The right people were in the right places, Durand provided expertise in softwood plywood, and trade with the Soviet Union generated the funds with which to expand operations in the West.

“Heikki and I made frequent trips to Moscow in the eighties. Our trade with the Soviet Union totaled FIM 150–200 million a year.”

Leppänen recalls how the chief executive of Prommash Import came to Raute’s stand at a Moscow trade fair in 1986 and told Leppänen to cancel all the meetings he had scheduled for the afternoon because the chief executive wanted to negotiate a deal. A few hours later, when the men sat down at the same table, the chief executive’s assistants produced a Raute offer on a lathe and a hydraulic lathe feeder made a year earlier and asked whether the offer was still valid.



When Pekka Leppänen joined Raute, he was tasked with taking Raute to the Western markets. He was the fourth person in the company to speak English.

“We quickly calculated the price changes and came up with a new price to offer. The chief executive then asked whether he’d get a discount if he purchased more at once. After a few hours of negotiating, we sold him 50 lathe/block centering analyzer combinations for something like FIM 72 million,” says Leppänen with a smile.

The process business has always been susceptible to economic fluctuations. At Raute, it was even more so due to the vast majority of its sales relying on one country. Following the collapse of trade with the Soviet Union, the company was forced to warn around 800 production and office workers in the metal industry unit about potential furloughs.

Pekka Leppänen was Raute’s managing director until 1992. Leppänen—or Leppäs-Pekka, as he was called at the company—was a well-liked and respected manager who successfully shifted the focus of the company’s operations from the Soviet Union to the West by expanding and materially stabilizing the North American operations and initiating the company’s exports to Southeast Asia.



STORIES FROM RAUTE

RECESSIONS HAVE BEEN OVERCOME WITH TENACITY AND RESOURCEFULNESS

The forest industry has always been susceptible to economic fluctuations and this was the case for Lahden Rautateollisuus.

The company faced its first real challenge in the 1930s, when the global depression reached Finland. The depression was its worst in February 1932, when more than 90,000 people, or approximately 5.4 percent of the working-age population, were unemployed. At Lahden Rautateollisuus, too, the depression resulted in shortened working hours and pay cuts. The second time the company was confronted with difficult times occurred in the aftermath of the energy crisis in the mid-1970s. These difficulties, too, the company survived by tightening its belt, streamlining the business and investing in product development. The dissolution of the Soviet Union in 1991 brought the Eastern trade to an end overnight, which

Technical director Harri Säkjärvi and secretary Leena Lottanen.

Whenever possible, the company has opted to train its personnel rather than furlough them.

presented plenty of challenges for a company which had engaged in busy trade with Finland’s eastern neighbor.

What helped the company through the depressions was its three-prong structure: when one profit center was doing poorly, the other two balanced the financial results. Even though the recessions that have hit Raute the hardest have resulted from global slumps, the company’s internationalization has also helped it to survive them. For example, when markets in Europe, the Soviet Union and North America stalled at the turn of the 1980s and 1990s, the Asian market was doing well.

Whenever possible, the company has opted to train its personnel rather than furlough them. Occasionally, when other work has been unavailable, products have been manufactured and stocked, and particularly during the company’s early years, the factory took on temporary work to keep its men at work. The same method was used in the late 1970s, when the company made the sizable self-closing, gas-tight doors for the metro stations in Helsinki which would have allowed the stations to be used as air-raid shelters, should the need have arisen.

EMERGING EVEN STRONGER FROM SLUMPS

The recession resulting from the 1970’s energy crisis was the deepest since World War II. In Finland, the metal industry suffered the most. In the mid-1970s, around 40 percent of the Finnish metal industry’s production was exported, and at Lahden Rautateollisuus, exports accounted for some 60 percent of the production.

As was the case in most Finnish companies, 1974 and 1975 were good years for Lahden Rautateollisuus Oy. Many companies “hoarded” their workforces, which then proved too heavy a burden when the recession took hold. Lahden Rautateollisuus had not hoarded its workforce, but it had made corporate acquisitions. In 1975, the company acquired the entire share capital of Enwe Oy and Nastopuu Oy and an interest in Infor Oy. When the acquired companies were merged with the parent company, the number of employees increased considerably. This backfired when the energy crisis landed in Finland.

In November 1975, plywood mills across the country shut down their production for up to three weeks due to the decline in demand. In December that year, President Kekkonen declared a national



Information technology from the early eighties. In the photo, an operator is taking a data backup on a magnetic tape.

state of emergency. More than 60,000 people in the country were unemployed, with no end in sight to the rising unemployment. In early 1978, the unemployment figure in Finland had risen to nearly 200,000.

The Raute profit center was hit especially hard by the recession. The order book emptied, and the company was again forced to shorten the workweek and furlough people. *“Due to a decline in the export business, Lahden Rautateollisuus Oy has decided to furlough 34 office workers in the Raute department as of the beginning of December,”* wrote the newspaper Etelä-Suomen Sanomat on October 23, 1976.

The solid results of Lahden Vaakan and Sope helped the entire Group until the order for the Beeskow particle board mill from East Germany in late 1977 turned the company’s fortunes around. The company delivered the particle board mill in cooperation with its biggest competitor, Rauma-Repola. Thanks to the deal, the company could once again expect things to improve, and its net sales doubled over a period of two years.

In a 75-year anniversary interview given in 1983, then managing director Heikki Mustakallio said the company was already prepared for future fluctuations in the forest industry's economic cycles. *"We're mitigating them with the help of product development and increasingly international marketing."*

THE COLLAPSE OF THE SOVIET UNION

The coup d'état attempt staged by hardline communists in August 1991, which led to the disintegration of the Soviet Union, plunged all of Raute's business areas into difficulties at the same time. The barter trade system came to an end overnight. Raute had two mill deliveries in the yard of its Nastola factory awaiting departure for the Soviet Union— one of them a particle board mill about to be shipped to Chelyabinsk and the other a plywood mill destined for Bratsk. Half of both mills had already been delivered, while the other halves were standing in crates in Raute's yard, awaiting trains. The value of the packaged machinery intended for the plywood and particle board mills which was left standing in the yard was FIM 76 million.

The collapse of the Soviet Union changed Raute's market completely. The Soviet Union was gone, and the company would not be making a single deal on Russian soil for the next decade.

In the final issue of the personnel magazine in 1991, Kari Airaksinen, head of the Wood Processing unit, wrote about the difficult times as follows: *"Finland's economy is in a tailspin, the end of which is not yet in sight. The upheavals in the Soviet Union have paralyzed normal trade, and buyers are unable to meet their contractual obligations. The economy has yet to get back on a growth track in the United States and several European countries. As a trade partner, the former Eastern Europe is in the grips of new arrangements. The only bright spot in sight is Southeast Asia, where the economy is still growing strongly, even if the pace of the growth has slowed down a little..."*

A change for the better may occur as rapidly as the recent collapse. What we need now is a fighting spirit! Let's show everyone that we can make it!"

And make it the company did once again, with the tenacity and cooperation characteristic of Raute, emerging even stronger than before.

The new increase in business was underscored by the shortening of the name Lahden Rautateollisuus Oy to Raute Oy.

WORK IN THE FORM OF TURNING THE ROLLER HEADS OF HOUSEHOLD MANGLES

Due to the lack of work, the factory adopted a three-day workweek in 1966. Veijo Kauppinen, the work planning manager at the turner's shop, managed to get work for the turners from the Pori-based company Rosenlew, at which point the turner's shop began turning roller heads for household mangles. The work was new and entirely different from the factory's normal production, which is why Kauppinen made the necessary tool layouts himself.

"I thought you couldn't turn a coil with a turret lathe, but I was wrong. Veijo had worked it all out in advance and taught us how to do it," says Pekka Käksi, looking back at the hard times. He had joined the company as a lathe turner in 1965, aged only 15.

There were plenty of roller heads to make. The billets arrived at the factory every two weeks, and finished products were sent back to Pori on the same occasion. In the end, the work was carried out in three shifts, five days a week, around the clock, while everyone else at the factory was still following a three-day workweek.

The cutting fluid used at the turner's shop was industrial-grade alcohol. It paired well with aluminum, finishing the surface and making it shiny. Its downsides included the substance's strength and the amount used. Some 20 liters of alcohol with a 90 percent content by volume was volatilized in the air of the factory hall every day. When the alcohol ran out, more was fetched from a barrel furnished with a pictogram of a human skull and crossbones. The older lathe turners may also have taken some in a coffee cup as they passed by, to make the work pass by more smoothly.

"There was no air conditioning in the turner's shop in the 1960s, and the air was thick with alcohol fumes. In the morning when you opened the door, you were greeted by a humid vapor. After half an hour, you no longer noticed the smell," says Käksi with a laugh.

Thanks to the work commissioned by Rosenlew, the turner's shop did not have to hold cooperation negotiations. For his part, Käksi had had enough of turning and decided to pursue further training. He returned to Rautateollisuus later, first as a foreman and subsequently as a production designer. He retired from Raute in 2014.

The background of the entire page is a dark, muted purple. Overlaid on this background is a vintage surveying level, specifically a 'Lahden Vaaka Oy' model. The level features a circular dial with a scale and a central needle. A chain is attached to the bottom of the device. The text 'LAHDEN VAAKA OY' is visible on the dial.

LAHDEN VAAKA— RAUTE PRECISION AND SCOPE

1914 The first wood-framed decimal balance is produced.

IN THE 1920S, the range of scales grows from wood-framed decimal balances to household scales, including kitchen scales.

measuring appliances required in industrial processes.

IN THE 1960S, Vaaka focuses strongly on the development of new weighing and dosing systems for the chemicals, glass, cement, concrete, ceramics and food industries, among others.

1967 Termit's production is discontinued after only three years of production.

1970 Heikki Mustakallio becomes the Group's managing director and Pentti Kiilholma (MSc (Eng.)) begins his work as head of Vaaka.

Lahden Vaaka begins export operations in **THE 1970S**.

1971 Lahden Vaaka delivers a dry-mix product factory for Paraisten Kalkki Oy. It is the company's first delivery consisting of a dry-mix product factory.

1986 Lahden Vaaka's name is changed to Raute Punnitus ja Automaatio.

1997 Raute Precision achieves the best financial result in its history.

1998 Raute Precision establishes a sales office in Shanghai to develop sales and customer services for the glass and dry-mix product industries.

1914

2004

1930 The scales factory produces the first 40-ton railroad track scales for the state-owned railroad company Valtion Rautatiet (VR).

1944 Lahden Vaaka is unbundled into a subsidiary. Its own brand name offers better opportunities to make the products known.

IN THE 1950S, the focus of Lahden Vaaka's production shifts to weighing and

The first concrete batching plants are delivered in

THE 1960S.

1961 Lahden Vaaka is again merged with Lahden Rautateollisuus.

1964 Lahden Vaaka tries to capture new markets and develops the Termit chainsaw. The chainsaw's first prototypes are produced in Lahti.

1988 The name is changed to Raute Precision, which is considered more suitable for an international high-technology company. The 1990s marks the start of the expansion to international markets. By 1992, international sales already account for approximately 20 percent of the company's total sales.

1995 Raute Dry Mix Oy is established.

2003 Raute is one of the world's two largest raw materials suppliers for the glass industry and the third largest supplier of factories for the mortar and filler industry.

2004 Raute Group sells Raute Precision's business operations to the private equity company Eqvitec Partners Oy and Raute Precision's top management.



President Kekkonen at the trade fair stand of Lahden Rautateollisuus in 1969.

STORIES FROM RAUTE

PRECISE AND RELIABLE SCALES

If the machines made by Lahden Rautateollisuus represented entirely novel products in Finland's industrial landscape, so did the scales it made.

The production of the scales, which began in 1914, required high technology and precision mechanics. Henrik Schwartzberg developed the production of the scales with the same pride and ambition as he did the wood processing machinery, and in Finland, the scales market did indeed rapidly become to be dominated by Lahden Rautateollisuus.

In the 1920s, the range of scales grew from wood-framed decimal balances to household scales, including kitchen scales. The production of scales accelerated and became more profitable when the company abandoned the use of the cast iron made in its own foundry and when pressed components replaced thick iron plates in side frames. Following these changes, the scales factory produced roughly 2,500 decimal balances and 2,000 platform scales a year.

When Lauri "Tahko" Pihkala, brother of Henrik Schwartzberg's wife Hanna and the father of Finnish baseball, noted that the market should offer small personal scales that could fit in the corner of a bathroom, they were

The first wood-framed decimal balance was produced in 1914.

produced. Pihkala also participated in the design of these “fitness scales.” *“On the other hand, I think that the front side of the ‘forearm,’ which leans against the calf, should remain unchanged or if changed at all, should be 15 mm shorter. This would allow individuals with thick calves to trade the places of the right-hand and left-hand side Knefix clamps, so that the straight sides of the forearms would rest against the calf,”* wrote Tahko in a letter having familiarized himself with the first prototype.

The fitness scales became enormously popular and sold well until small and inexpensive scales from abroad entered the market.

The scales factory also developed taller personal scales, the operation of which relied on a sliding weight. It was extremely accurate, and therefore ideal for schools, hospitals and doctor’s appointments. One can still bump into these personal scales relying on sliding weights at antenatal clinics or at the offices of school nurses.

TOWARD BIGGER SCALES

As the technology developed, the product range grew, and product development moved toward the larger warehouse, industrial and railroad track scales. The production of special scales increased, and in 1930, the scales factory produced the first 40-ton railroad track scales for VR. In 1944, the scales factory was unbundled from Lahden Rautateollisuus Oy into a separate company, Lahden Vaaka Oy. The unbundling aimed to give the scales factory better development opportunities. The new company’s own brand name also offered better opportunities to make its products known. Nearly 20 years later, in 1961, Vaaka returned to its roots when it was merged with Lahden Rautateollisuus again.

Throughout the 1960s, Lahden Vaaka developed new scales applications for the chemicals, glass, cement, concrete, ceramics and food industries, for example, and added automation to the scales.

The new inroads into the markets also increased the company’s expertise, and in the mid-1960s, Vaaka began to deliver entire weighing facilities. Its first project deliveries consisted of batching and mixing plants.

POLISHING THE WEIGHTS TO TOLERANCE

Lahden Vaaka’s success in the markets was based not only on its precise and reliable scales, but its servicing. According to the law, a “sealer of weights and measures” had to inspect all scales used in commerce and public transportation at specific intervals. The fitters of Lahden Vaaka therefore toured the country continuously, carrying out “*either recurring, contractual or random servicing*”.

“First you place a weight in one corner, then another, then a third and a fourth. The weight’s mass is five kilos. The needle on the large scales may show only a tiny discrepancy from the true value. A diagram has been drawn of the deviation. After the corners have been checked, weights of different sizes are placed on the scales. The point is to ensure that the amounts weighed really correspond with the true values,” said a 1966 article on the calibration of scales in the newspaper Etelä-Suomen Sanomat.

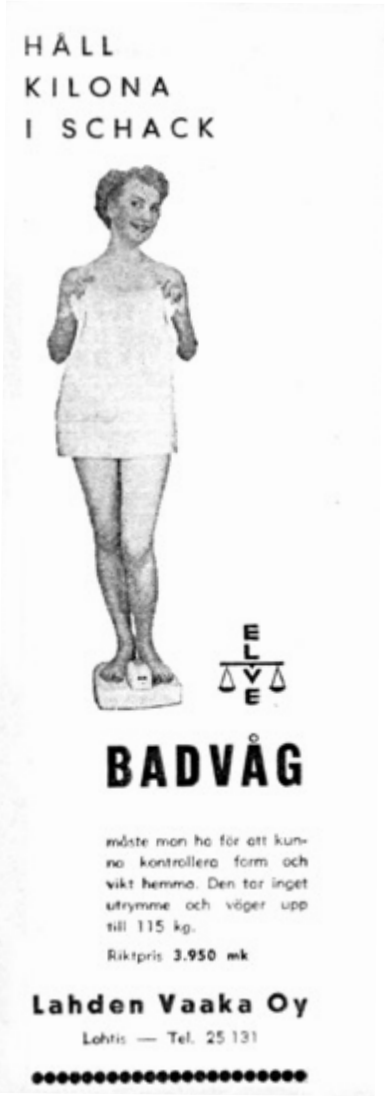
For decades, the person responsible for the weights’ accuracy at Lahden Vaaka was Edit Rantanen, who polished the weights. She worked on the fourth floor of the scales factory and ensured the accuracy of the weights to up to a milligram. This was no easy job, given that the mass of the weights varied from a gram all the way to 50 kilos.

While the small weights could be brought to a precise tolerance by careful polishing, the same technique was not applicable to larger weights, which were placed on a control balance’s other plate. The weight had a tiny 25-millimeter hole for which Rantanen weighed and then inserted tiny bits of lead until the weight’s mass was exactly, rather than almost, right. The lead was then tightly plugged, and the hole was closed.

Edit Rantanen retired in 1972.

IN-HOUSE PRODUCT DEVELOPMENT

From the outset, the scales factory had its own product design, and for a long time, the person responsible for it was Leevi Heiskanen. Tapio Strandberg, whose long career at Lahden Vaaka began in 1959, says everyone trusted Heiskanen’s skills. He was never asked whether he could do this or that kind of balance but was simply informed that an order of this or that kind had been placed. And Heiskanen then





Grammoista kymmeniin tonneihin punnitaan Lahden vaa'oin kautta maamme

Yli 30 vuoden kokemus... tarkat tutkimukset... ammattitaitoinen henkilökunta... tarkkuuskoneet... erikoistyövälineet... Siinä edellytyksemme tarkkojen, varmojen ja vankkojen vaakojen valmistajaksi! Nykyinen tuotantomme käsittää

- kirjevaakoja
- talousvaakoja
- kymmenysvaakoja
- siirtopainovaakoja

- kaksoisheiluri-vaakoja
- autovaakoja
- raidevaakoja sekä
- vaakja erikoistarkoituksiin.

Annamme auliisti lisätietoja Teille sopivista tyypeistä. Suoritamme myös vaakojen huoltoa ja asennuksia.

— Lahden tarkat, varmat, vankat vaa'at —

Läheväki N: 12, 1949.

Lahden Vaaka Oy
Lahti - Puhelin 50 31

Enemmän TARKKUUTTA ja NOPEUTTA punnitukseen.

Lahden kaksoisheiluri-vaaka H 4-50 sopii erinomaisesti tehtaisiin, varastoihin ja myymälöihin nopeutensa ja tarkkuutensa ansiosta.

- * silta 430 x 500 mm
- * teho taululla 50 kg
- * „ tehotangolla 20 kg
- * „ taaratangolla 5 kg

- * jaoitus taululla 50 gr
- * korkeus 128 cm
- * paino n. 125 kg

Saatavana myös ruostumattomalla tavara-alustalla sekä kuljetustelineellä varustettuna.

Tiedustelkaa hintojamme — annamme auliisti lisätietoja tuotannostamme.

VAAKOJA KAIKKIIN TARKOITUKSIIN

Lahden Vaaka Oy
LAHTI — PUHELIN 50 31

Läheväki no 11-12/50. 9.12.50



designed the required product, whether it concerned small kitchen scales or a 100,000-ton balance.

The scales factory also tried to capture a share of the market in the mid-1960s by developing a chainsaw, for example. Sawmills were doing robust business, and there was demand for a Finnish chainsaw on the market, which was then dominated by imports. Chief design engineer Erkki Myllymäki was a gifted technical designer, who nevertheless lacked previous experience in the design of chainsaws. He was tasked with designing a Finnish chainsaw that would be at least as efficient as those already on the market.

The first prototypes of the Termit chainsaw were made in Lahti. At first, their frames were cast at the company's own foundry, but for one reason or another, they could not be made light enough. During the mass production phase, the frames' cast-iron components, pistons and cylinders were therefore made in West Germany, at the factories of MAHLE. Regardless, Termit weighed nearly ten kilos at the same time as the competitors' chainsaws were getting lighter. Termit's production was discontinued in 1967, after only three years of production.

From the mid-1960s onwards, Pentti Vaskinen oversaw Vaaka's design engineering. At its largest, his team comprised nearly 40 design engineers.

VAAKA DEVELOPED LOGIC FOR WOOD PROCESSING PRODUCTION LINES

Electronics designer Kari Sintonen was an innovative pioneer who oversaw the development of Raute RIC-85 at Lahden Vaaka, a logic designed specifically for the production lines of wood processing, in the early eighties.

“Other people came up with ideas, and Kari investigated their feasibility. He always used to ask us whether we had any germs of ideas. One day someone answered, yeah, we have an idea on the control unit. The young automation engineers were eager to come up with a better way to program the clumsy analogue software,” says Raimo Seppälä, who worked in product development at the time.

The interesting thing about Rics, as the RIC-85 logic came to be called, was that its development was originally carried out partly in secret, with the tacit approval of Pentti Kiiholma, then head of Vaaka.

YLEISVAAKAMME

on nyt vakioitu, mikä toimenpide näyttää saaneen myös asiakkaittemme yksimielisen hyväksymisen. Samalla on otettu käytäntöön uusi, asiallinen muotoilu.



PÖYTÄMALLI
Automaattinen
KAKSOISHEILURIOSOITINVAAKA H 7
Punnituskyky 15—85 kg
Asteikon jako 20—50 g

LATTIAMALLIT



Automaattinen
KAKSOISHEILURIOSOITINVAAKA H 9
Punnituskyky 25—5.500 kg
Asteikon jako 20—5.000 g



Automaattinen
KAKSOISHEILURIOSOITINVAAKA H 3
Punnituskyky 250—5.300 kg
Asteikon jako 100—1.000 g



Automaattinen
VALOASTEIKKOVAAKA VA
Punnituskyky 100—5.000 kg
Asteikon jako 50—2.500 g
Myös pöytämalli 50 kg



SIIRTOPAINOVAAKA S
Punnituskyky 100—5.000 kg
Lukematarkkuus 25—500 g

Taaroitus-, annostelu- ja painonleimauslaitteet sekä muut lisävarusteet selviävät uudesta hinnastostamme n:o 2, johon myös sisältyy yksityiskohtainen koko- ja painotaulukko. Teemme ehdotuksia erikoissovellutuksista. Pyytää selostusaineistoa.

LAHDEN VAAKA OY
LAHTI — PUH 25 131

Once the program was ready, it became a success: Ricks was used widely around the world and remains in use to this day in many places, even though it has not been produced for decades now.

Once the program was ready, it became a success: Ricks was used widely around the world and remains in use to this day in many places, even though it has not been produced for decades now.

“Ricks’s beauty lay in its simplicity. An electrician could learn the programming language in no time at all, with no background in programming to speak of,” adds Seppälä.

The in-house logic was originally devised because international logics were subject to an export ban in terms of Russia and its neighboring countries.

BECOMING A PROGRAMMER THE HARD WAY

Before the Raute RIC-85 logic developed by Vaaka and other external logics, the machines’ technology was relay-based. In simple terms, this means that somewhere there was a guard, which gave an impulse to the switchgear relay, which in turn relayed the command to the machine. Around the mid-1970s, the relays controlling the operations of machines began to be replaced by program-based logics. Usually, the client who bought the production line wanted to specify whose logic the production line employed.

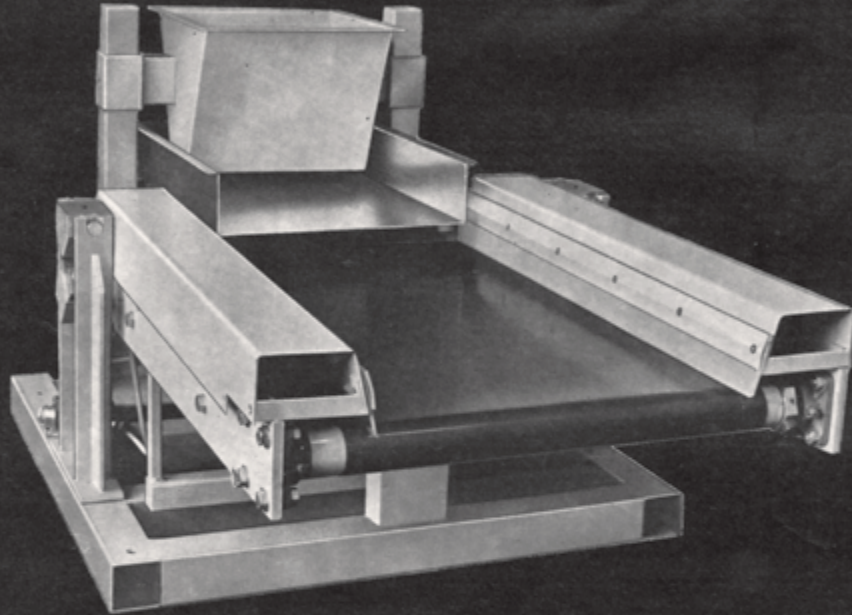
Olavi Mainela, who joined Lahden Rautateollisuus in the summer of 1972 as an electrical engineer, remembers his first introduction to logic. The company was making a veneer joining line for UPM. A line of this kind had never been made for anyone else in the world and would not be made after this. The line was to be equipped with a Siemens logic.

“On the Thursday before Easter, a bus brought a suitcase to the Lappeenranta bus station with a program of some kind in it. I’d never seen one before. So for the Easter holidays, I sat in the empty factory’s transformer room, and learned to understand the logic by pushing the buttons and seeing what happened.”

By the time the others returned to work after Easter, Mainela was familiar with the logic and continued to program the line. Back then, automatic control systems were not studied anywhere; instead, everyone participated in the development of a new technology and acquired the expertise through trial and error.

“We didn’t have any kind of training for programming. Instead, we learned it by trying things and seeing what happened. We learned all our lessons the hard way. When you made a mistake, you learned

Hihnavaaka tuotantoprosessin tärkeänä osana



Kuva esittää syöttösäateistä, annostelevaa hihnavaakaa, jota voidaan käyttää mm. prosessiteollisuudessa, jossa tarvitaan jatkuvatoimista, tarkkaa annostelua. Jos järjestelmään liitetään useampia vaakoja, saadaan aikaan tasaisena pysyvä seossuhde eri materiaalien kesken.

Lahden Vaaka suunnittelee ja valmistaa tuotantolaitoksille punnitus- ja annostelujärjestelmiä, jotka tekevät mahdolliseksi raaka-aine- ja valmisteverastojen jatkuvan tarkkailun sekä tasaisen laadun vaatiman tuotantoprosessin tarkan säädön. Tärkeimpiä jatkuvan punnituksen vaakatyyppejä ovat integroivat ja annostelevat hihna-

vaa'at. Integroivien hihnavaakojen punnituskyky vaihtelee tavallisimmin 1 t/h—1500 t/h, ja annostelevien vaakojen maksimitehot ovat vastaavasti 100 kg/h—120 t/h. Sähkömekaanisten vaakojen punnitus- ja annostustarkkuus on punnituskyvystä, materiaalista ja olosuhteista riippuen 0,2—1,0 %.

LAHDEN RAUTATEOLLISUUS OY
LAHDEN VAAKA

PL 138 — 15111 Lahti 11 — puh. 918-44 911 — telex 16-162

Yhden miehen oh- jaama betonitehdas

Tämä Lahden Vaa'an suunnittelema ja toimittama betonitehdas tuottaa n. 75 kuutiometriä valmista betonia tunnissa. Ohjaukseen ja valvontaan tarvitaan vain yksi mies.

Tehdas on suunniteltu valmistamaan massaa myös elementtitehtaan raaka-aineeksi.

Tehtaan käyttämät kiviainekset on varastoitu kuuteen 80 m³:n vastaanottotaskuun sekä 150 m³:n tornisiiloihin. Vastaanottotaskut ovat kuumailmalämmitteiset, ja ne on varustettu lämpöeristetyillä kansiluukuilla.

Sementin varastona on 2 × 30 m³:n tornisiilo.

Annostelu tapahtuu kiviaineksen, sementin ja veden osalta sähkömekaanisilla vaa'oilla, joissa on helposti luettavat analogiset osoitin-kojeet.

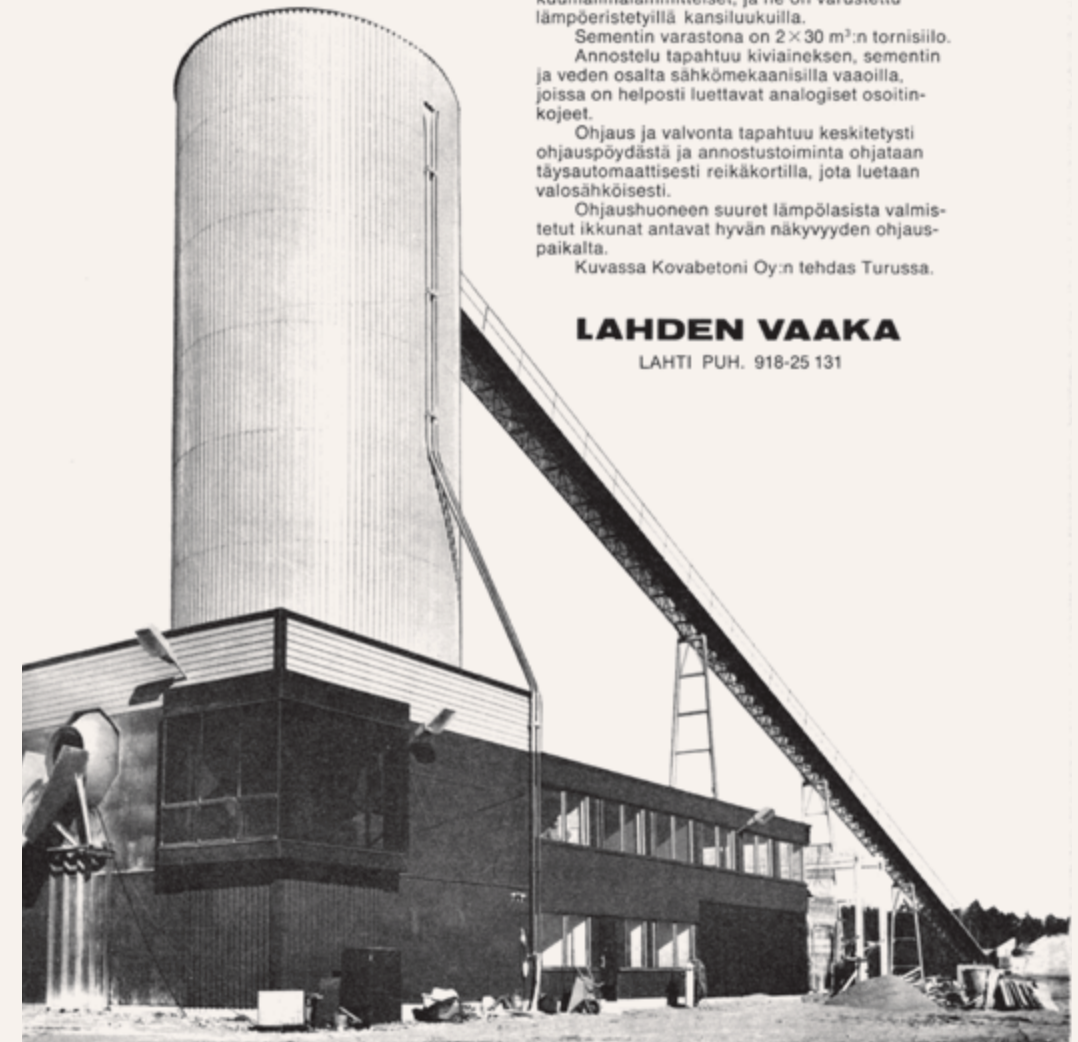
Ohjaus ja valvonta tapahtuu keskitetysti ohjauspöydästä ja annostustoiminta ohjataan täysautomaattisesti reikäkortilla, jota luetaan valosähköisesti.

Ohjaushuoneen suuret lämpölasista valmistetut ikkunat antavat hyvän näkyvyyden ohjauspaikalta.

Kuvassa Kovabetoni Oy:n tehdas Turussa.

LAHDEN VAAKA

LAHTI PUH. 918-25 131





from it and did not make the same mistake again. It was tough, but it also toughened you.”

After the Raute RIC-85 logic was ready for use, the company used its own logic in place of external ones.

Ricks proved adaptable. It was used in everything from the control units of production lines to the coastal artillery’s ranging and gun laying. Lahden Rautateollisuus even built its own electronics plant in Lahti to produce components.

**THE ERA OF AUTOMATION,
ELECTRONICS AND ADP**

Heikki Mustakallio worked as Lahden Vaaka’s managing director until Aarne Mustakallio’s death. When he became the entire Group’s managing director in 1970, he asked his university friend Pentti Kiilholma (M.Sc. (Eng.)), to manage Vaaka.

”Kiilholma’s conduct was always very correct, in many ways resembling that of a bygone era’s factory owner. The week invariably began with a survey of the engineering workshop. Kiilholma, accompanied by a few people from the drafting office, led the procession through the workshop in his patent leather shoes, pipe in hand”, Tapio Strandberg recalls the group touring the factory from one workstation to the next, with Kiiholma getting a review of what was being done at each of the workstations and the stage at which each work was.

Pentti Kiilholma died suddenly in 1980. During his time in charge, the scales factory moved into the era of automation, electronics and automatic data processing.

“Electronics turned out to be a lifesaver for the scales factory. Without the introduction of electronics, the scales factory would no longer exist,” said vuorineuvos Heikki Mustakallio in an interview with the newspaper Etelä-Suomen Sanomat in 1983.

Mustakallio added that the contribution of electronics was based on the precision mechanics industry which had formed around the scales industry. Scales and balances were expected to be capable of stamping, registration and other enhanced functionalities, which would have been difficult to develop with mechanics.

“As a small producer, we would not have had the financial means to develop a scales industry based on mechanics. Instead, electronics

solved that problem for us in that it allowed us to buy components and produce scales.”

Once weighing had digitalized, electronics was a fundamental part of the production, accounting for 30 percent of net sales by 1985. Electronics’ entry into the process shifted the focus of the operations materially in the direction of manufacturing. The company, which changed its name to Raute Punnitus ja Automaatio in 1986, designed, built, and programmed systems which facilitated the entirely automated control and supervision of weighing and materials handling. The focus of production was a microcomputer which represented the company’s in-house product development.

INCREASED GROWTH AND EXPORT DEVELOPMENT

The company, which had changed its name to Lahti Precision in 1988, developed strongly throughout the 1990s. It had become an export firm and its net sales had grown significantly. The company achieved the best financial result in its history in 1997.

Raute Precision was composed of several business areas, all of which shared the use of weighing technology. The company was an expert not only in weighing technology but in the handling of loose materials and the related automation and projects.

The operations were divided into four business units. The glass industry and dry-mix product industry units focused on only one business area globally, while the standard products and projects units mainly served clients in Finland and its neighboring areas.

In the 1990s, the glass industry unit grew into one of the world’s leading companies supplying raw material plants for the glass industry. Its success was based on the long-term development of its expertise in weighing, the handling of loose materials, and the related automation. The precise proportioning and mixing of raw materials played a particularly important role in the production of plate glass. Raute Precision’s technology achieved a first-rate raw materials mix, reflected in the quality of the end product. Because of this, Raute Precision could count most of the world’s leading plate glass producers, including Pilkington, among its clients.

In the home markets, Raute Precision had reinforced its position

as a leading company in industrial weighing. It served Finland’s industrial sector and public sector by producing the basic components of weighing, industrial scales, weighing and dosing systems, and the related services. Raute Precision had a leading market position in Finland as a provider of the weighing industry’s servicing, calibration and other laboratory services.

The company had undergone many phases to evolve from the manufacturer of wood-framed decimal balances to a major project supplier and to become Finland’s leading producer of scales and balance systems. In addition to weighing systems, Raute Dry Mix Oy supplied dry-mix product plants to clients around the world. The plants used a patented fluid system in the dosing of raw materials, thanks to which the raw materials could be proportioned at great speed without compromising on precision.

By 2003, Raute Precision was one of the world’s two largest raw materials suppliers for the glass industry and the third largest supplier of factories for the mortar and filler industry. A year later, the management of Raute wanted to shift the focus back to its core business. The Group therefore sold Raute Precision’s business operations to the private equity company Eqvitec Partners Oy and Raute Precision’s top management. The approximately EUR 2 million capital gain from the transaction was used in the development of the Raute Wood business area.

THE MANAGING DIRECTORS OF LAHDEN VAAKA:

Aarne Mustakallio 1952–1960
Heikki Mustakallio 1960–1970
Pentti Kiilholma 1970–1980
Lasse Kirmo 1982–1988
Sakari Haapasalo 1988–1991
Pentti Aalto 1992–2004



FURNITURE MAKING FOR NEARLY HALF A CENTURY

Lahden Rautateollisuus Oy established its sister company, Sopenkorpi Oy, after the wars, in 1945, to balance economic fluctuations, and test and develop machines aimed at the woodworking industry. The furniture factory Sopenkorpi Oy became known for its quality furniture and the Tower line, which was popular in the 1960s.

Sopenkorpi was merged with Lahden Rautateollisuus Oy in 1965, after which it operated as an independent department. Thanks to its considerably high skills in the furniture industry, Sopenkorpi survived the recession, which had a strong impact on its line of business.

In 1975, the unit came to include Nastopuu Oy, which operated under the name of the Nastola factory (Nastolan tehdas).

In Finland, the unit's sales were taken care of from the factory to private furniture dealers through sales reps and telemarketers. At the turn of the 1970s and 1980s, roughly half the production was exported. The biggest export destination was the Soviet Union, followed by Sweden, West Germany, Norway, the Netherlands, Switzerland and France, among others.

Sopenkorpi's production was decentralized to Sopenkorpi, Nastola and Möysä. While the old Sopenkorpi factory specialized in the production of board-structured furniture such as shelves, beds and dressers, the Nastola factory focused on

the handling of solid wood. At the beginning of the 1980s, the Nastola factory was Finland's largest manufacturer of solid wood tables and chairs. The upholstery shop was in Möysä.

In 1984, Raute acquired the business operations, warehouses and equipment of Keravan Puusepäntehtaat from Oy Stockmann Ab. These were integrated into Sope.

"Sope's agonizing final stretch" read the headline of an article published in 1994. "The furniture maker Sope Interior has slowed down Raute's recent development as effectively as a stone sled. It has weighed down the group's results, but above all, the self-esteem of all Raute employees," said the article, adding: "Established immediately after the wars, Sope has been one of the country's best-known and largest furniture makers. It has been an important supplier particularly for independent dealers in the furniture business. It has been considered a producer of quality furniture; Sope's Vitriini shelf units are probably one of the strongest furniture brand products after Muurame's furniture lines. Raute failed to find a successful channel for Sope's products and to develop the company's business in other respects. The company hit a brick wall when the owner no longer mastered the furniture business".

In 1994, Raute abandoned its lossmaking furniture business to focus on wood processing machinery and weighing.

THE ERA OF DIGITALIZATION AND AUTOMATION

2000 The net sales of the Raute Wood business area grow to FIM 601 million.

Raute Wood’s most important market area is North America, which accounts for 42 percent of its net sales.

Raute Wood Ltd. gets the ISO 9001 quality certificate.

The Nastola unit gets the ISO 14001 environmental certificate. The studies involving the environment concern the plywood production process’s various production phases.

2003 The lossmaking OSB business is discontinued.

Raute acquires Mecano’s entire share capital.

2006 The company gets a new look.

2007 The subsidiary Raute (Shanghai) Machinery Co., Ltd. is established in China.

2010 The first local service center is established.

2011 Clients are introduced to RautePro, RauteSelect, Raute-Smart—Raute’s solutions for different client needs.

2012 Raute signs a deal valued at more than EUR 50 million on the delivery of a plywood mill to the Chile-based Arauco Nueva Aldea.

2019 Raute’s second service center is opened in Kirov, Russia.

2022 Raute relocates its production in China to a new facility in the city of Changzhou.

President and CEO Tapani Kiiski leaves the company.

COO Petri Strengell is appointed the company’s interim President and CEO.

2000

2022

2001 Raute acquires Jymet-Engineering Oy, which produces highly automated production lines and equipment for the mechanical forest industry. The transaction improves the company’s standing as a supplier of veneer-based production processes.

Professor Tapani Aartomaa designs a common logo for the parent company and the business areas.

2004 Tapani Kiiski begins his work as Raute Corporation’s President and CEO.

Raute Precision is sold to that company’s top management.

2005 Raute Service LLC, which provides servicing and spare parts services, is established in St. Petersburg.

2020 Raute’s net sales reach an all-time high.

The mills’ first approval tests and equipment rollouts are carried out remotely.

A massive delivery to Russia as the Raute LLC Plitwood company commissions a plywood mill from Raute.

Raute acquires a majority of the share capital of Hiottu Oy, a programming firm specializing in computer vision.



STORIES FROM RAUTE

FROM A PROJECT HOUSE TO A PRODUCT HOUSE

Raute entered the new millennium in robust shape. The Group's net sales grew by more than a third in 2000, and its result improved considerably. Two thirds of the net sales derived from North America and Europe, including Finland. The future looked bright.

But after two good years, there was a significant decline in the volume of business. The general uncertainty in the world economy had a significant impact on business, and the Group's net sales decreased.

Clients postponed their investment decisions, and the implementation of investments already decided was delayed until things began to look up again.

Raute tried to balance the cyclical nature of production by shifting its focus from large-scale mill and plant projects to modernization and improvement projects. Costs were adjusted through furloughs and layoffs, for example.

The company invested in the future by developing the personnel's competence. It did this by improving various forms of on-the-job learning and by developing interaction and the sharing of expertise within the organization.

The key means by which Raute has distinguished itself from the competition have included automation and digitalization.

Product development was also kept on track— although net sales plummeted, nearly 7 percent of it was used in product development. The company also launched an IT product family designed for the veneer and plywood production process. It enabled the real-time monitoring and control of a plywood mill’s production. The new IT products allowed clients to boost their competitiveness.

Mika Hyysti, EVP, CTO, points out that Raute has invested in competitiveness and its improvement throughout the 2000s.

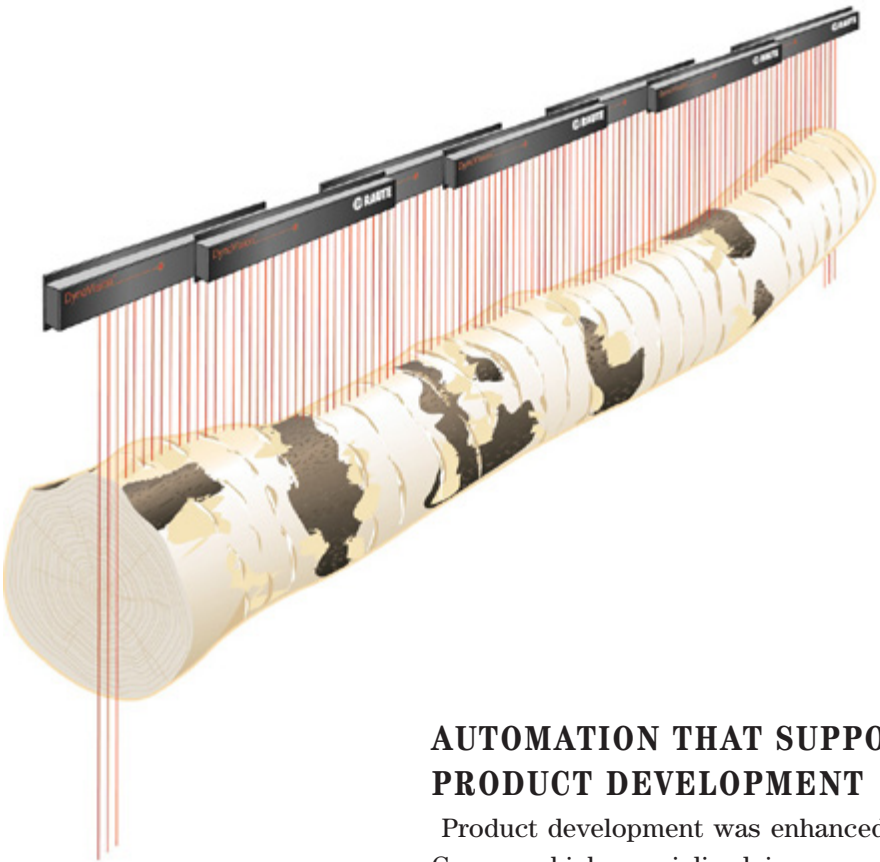
“In the technological sense, Raute’s machines represent the cutting edge of the market, but this also makes them expensive. We’ve had to find other means by which to excel or be competitive.”

The key means by which Raute has distinguished itself from the competition have included automation and digitalization, both of which the company began investing in in the previous century. By the turn of the century, the company had already developed a mill- or plant-wide data collection system. This means that a server embedded in a client’s factory floor collected data from the production lines, producing reports that could be viewed in a modern way from any location. Raute’s competitors could not provide equivalent systems.

Tapani Kiiski, the Group’s President and CEO since 2004, judges automation to be the aspect that has changed Raute most during the 2000s. It has enabled the development and improvement of productivity and process efficiency. It has also changed the personnel. IT and automation skills are emphasized, and this is visible in the fact that the personnel working in the head office these days outnumber the personnel working on the production floor.

“When I began working at Raute, 70 percent of the design engineers focused on mechanics, and the remaining 30 percent on automation. Today, these figures have flipped. We’re still a machine shop, but the focal point of our competence has changed.”

Hyysti agrees: *“When I joined Raute in 1990, Raute was a production unit. The iron arrived at the factory largely in the form of crude raw material. What followed was gas cutting and welding, after which the machines were processed into finished products. Nowadays, we’re a high-technology assembly house.”*



The picture shows a visualization, or diagram, of the laser beams of a block centering analyzer’s laser scanners. The block’s shape is calculated with the help of the data produced by the scanners. Once the block has made a 360 roll, its shape is used for a further calculation on where to attach the block to the turning so as to maximize the veneer yield.

AUTOMATION THAT SUPPORTS PRODUCT DEVELOPMENT

Product development was enhanced in cooperation with Mecano Group, which specialized in computer vision technology. Raute had acquired an interest in this Kajaani-based company in 1999 to strengthen its position as a turnkey plywood industry supplier. Mecano’s entire share capital was transferred to Raute in 2005.

Thanks to the cooperation, the development of automation took significant strides forward. In addition to computer vision, the company developed new measuring techniques for the plywood production process. The latest technology on this front was represented by a veneer patching line delivered to Finland. Soon the North American unit opened a computer vision technology center. The first veneer patching line in Raute’s history comprising three patching units was sold to the United States in 2001.

These days, automation plays a key role in Raute’s machine building. It has changed not only the personnel’s competence requirements, but also their job descriptions. Whereas before,

In addition to machine automation, the focus on high technology raised the safety technology to a new level.

men were sent to the other side of the world to start up machinery, that can now be done via remote connections from Nastola when necessary. In practice, operators monitor the machines on site, and in the event of failures or problems, Raute’s people can provide assistance remotely from their own workplaces.

Automation and measuring techniques, which accumulate savings in labor costs, are in especially high demand in Western countries. In developing markets, they have thus far played a more minor role. On the other hand, the automation that improves the yield of the raw material has been important across the globe. On the other hand, the automation that improves the yield of the raw material has been important across the globe. The minimization of environmental impacts is also increasingly valued. Thanks to product development, raw materials are used increasingly efficiently, and the emissions of clients’ mills and plants have decreased.

While several machines already include computer vision, Kiiski thinks Raute has only taken the first steps in this respect. In an interview given to the industry publication Tekniikka ja talous in 2012, he emphasizes that it is a question of insight and its cost.

EVP, CTO Mika Hyysti adds that as the number of operators declines, the automated monitoring of production and the optimization of raw material yields and the quality of end products are clear targets for the use of automation and digitalization. New methods for increasing production efficiency like the control and optimization of veneer cutting are also being continuously found. Thanks to technology developed by Raute, a veneer mat can travel through a rotating cutter on a production line at a speed of three meters per second. The cutter cuts veneer sheets of the desired size and grade from the mat while removing any flaws in them to the nearest couple of millimeters. This degree of precision is achieved with the camera’s less-than-a-millimeter resolution and the real-time control of the cutter’s knife. The rotating knife accelerates during the cutting cycle to match the maneuvering speed of the veneer mat to the nearest millimeter.

Alongside efficiency, the machines’ design and degree of automation is influenced by the requirement of flexibility. A production line may run a single plywood product for a mere two hours, after which the product changes. The lines must also lend themselves to changes of this kind.

The focus on high technology has also raised the safety technology to a new level. A good example of this is the delivery of the

machinery for the Verems mill of Latvijas Finieris, in which the safety functionalities were taken care of by a safety logic integrated into the control logic, instead of by the traditional wiring and safety relays. The safety logic and safety bus technology aimed for savings, flexibility and the safer use of the machinery in connection with deployment.

THE IMPORTANCE OF SERVICE OPERATIONS GROWS

At the same time as the company was investing in product development, it was also developing its servicing business.

From the 1960s until the early 1970s, servicing still relied on a screwdriver and an adjustable wrench, and every mill had its own servicing department. Up to 50–100 people could be working in servicing alone at a single plywood mill. They serviced the machines, for which the spare parts were manufactured at each mill’s or plant’s own machine shop. As the technology became more sophisticated, the machines came to include more hydraulics, adjustability, automated solutions and electrical control.

“First, we moved from relays to Rautateollisuus’s own Raute Ricks logic, then to other logics available on the market. This meant that a mill’s own people were no longer able to fix the machines, instead of which Raute sent a fitter there to take care of the repairs,” says Reijo Kaunisto, who was in charge of domestic sales.

And when clients were no longer supplied with pictures of the spare parts in conjunction with a machine delivery, the servicing of the machines by the client no longer made sense. Due to product development, the machines had become so complicated that the mills would have had to hire specialists familiar with different logic and control systems. It was easier to transfer the servicing of the lines and machines entirely to the machines’ builder.

The mills were first provided with servicing during the summer holidays, then with regular servicing. These days, the machines’ automation has risen to a level which demands troubleshooting to be taken care of by professionals.

“The new machines are more versatile than before and require skilled maintenance. Nowadays, our clients can improve their yield and quality and reduce the costs of labor by modernizing their existing range of machinery with state-of-the-art technology and



In November 2010, Raute held a maintenance seminar at the premises of Raute Service LLC in St. Petersburg for representatives of plywood mills with operations in Russia. The seminar was attended by a total of 25 maintenance managers and other technical representatives of clients from 22 different companies. The attendees were also introduced to an entirely overhauled and modernized PK30 block centering analyzer and lathe station.

The volume
of the demand
surprised
everyone.
Given that the
modernizations
had been
productized into
ready packages,
they were easy
to sell.

automation, adds Mika Hyysti, EVP, CTO. But this has not always been the case.

Although Service is one of Raute’s pillars today, this did not happen overnight. For example, the culture in Asia in the 1990s was that if something broke, it was fixed. Servicing as an activity was not held in great regard. Nowadays, though, the attitude to servicing has also changed in Asia, and many clients are approached with a fitter, rather than a sales rep, first.

Tapani Kiiski says three developments had a material impact on the growth of servicing activities. The first of these occurred in 2004, when Timo Kangas from YIT Service joined Raute to head its Service team. He was the company’s first service business professional. Until then, the servicing activities at Raute had been developed from the company’s starting points.

“Timo transposed YIT’s philosophies to Raute. He invested in domestic clients and began setting up Service companies in clients’ premises,” says Kiiski, looking back at how events unfolded.

The first Service company was established in Russia. Its operations got off to a slow start, but the endeavor was then more about anticipating the future. When the demand for servicing finally began to grow, Raute was already in the market.

Timo Kangas, who is now Group Vice President at Raute, says that sales manager Juha-Pekka Salimäki had established a solid foundation for the servicing business, one which facilitated its further buildup. Under the leadership of Kangas, the Service team invested in clients, the personnel, measuring and methodology.

“We began developing various data collection systems and our online spare parts business, for example. Our clients had IDs with which they were able to locate their production lines and the related drawings online. This allowed them to order the spare parts they needed directly from our factory,” says Kangas.

The company also hired more people to servicing and developed their competences. On the measuring side, the company adopted client-specific measuring.

“We studied things like how rapidly clients receive responses to their service requests. And we also invested in aftersales in an entirely new way.”

The biggest change took place in the thinking, however. For the first time, servicing was thought of as a business. It had previously

been part of aftersales, but now it was developed and monitored, and its results were reported on. Under Kangas, Raute also launched its modernization business— old machines could also be fitted with new technology.

“Our head of modernization, Jani Kakko, built ready solutions for replacing old technology with new tech. We were so successful at it that the modernization eventually grew into a business worth tens of millions.”

Raute’s first modernization project was delivered to Italy.

The thoughts on modernizing old machines were initially somewhat mixed among the company’s people. While it was seen as an opportunity, it was also viewed as a potential threat to the sales of new machinery.

“We began cautiously, probing whether there would be a market and demand for this.”

The demand took everyone by surprise. Given that the modernizations had been productized into ready packages, they were easy to sell. Each package came with a specification of the added value it could provide the client, such as a 2 percent increase in production capacity. The number of modernizations skyrocketed.

Kangas points out that while the old hardware is still good to go, automation and digital aspects are getting more advanced all the time, and it is because of this that modernization represents life cycle business at its best.

“In new products, we begin thinking about the pieces we can modernize later during the design phase.”

The next rise in the level of the servicing business took place when Petri Lakka in 2011 left Valmet to head Raute’s Service business.

“When Timo joined us, he came from an independent service provider and approached servicing with an emphasis on service, work and spare parts. Petri, on the other hand, had his roots in the chemical wood manufacturing industry, and took a different approach. He looked at the business from the perspective of the client’s process and its development: Service is a tool with which to develop the whole process,” says Kiiski.

Lakka also integrated servicing into marketing and sales. When the sales of the machines and servicing were integrated, and the sales reps sold servicing alongside the machines, the volume of the business increased even further.

For Raute,
the first years
of the new
millennium were
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and growth.

Lakka also initiated the systematic collection of customer feedback. In turn, this led to biannual development days, held by account managers for their key accounts, during which the participants reviewed the feedback and the company's responses to it. The company had moved from pure sales to customer relationship management and control. The third development important for the growth of the servicing business involved Kurt Bossuyt taking charge of the activities in 2016. He placed an increasingly strong emphasis on moving the servicing into clients' mills. What this meant in practice was that as part of the deal, Raute set up service points in clients' mills and agreed to be in charge of contract servicing for two years. Each deal also included two Finnish specialists who, in addition to the contract servicing, taught locals how to service the client's machines. Each service point also had a small warehouse of spare parts.

"The Service points focus not only on the client's production process but the maintenance process and its method and optimization. This takes Raute a step closer to its clients and improves the partnerships," says Kiiski.

The Service points also serve any other clients Raute has in their respective regions. This gives Raute a clear competitive advantage.

"None of our competitors make full-scale mill projects. Nor do they offer servicing that's as comprehensive, unique and easy for the client as we do."

In addition to the modernization packages, Raute has productized various specialist and training services.

FROM RECORD GROWTH TO RECORD ORDER BOOKS

For Raute, the first years of the new millennium were marked by changes and growth. The Group decided to concentrate on its core competence and shift its focus from the traditional mechanical engineering industry to deliveries with a higher degree of processing. In essence, this meant the divestment of Raute Precision, for example. Raute Precision, which specialized in weighing and dosing technology, was sold to its top management in 2004. But Raute also pruned its other operations and outsourced operations outside its area of core competence. Raute itself focused on heavy machining, assembly and final testing, while the component manufacturing and tooling



The picture was taken on the Myrtleford installation site of the Australian company Carter Holt Harvey's (CHH) plywood mill's machines. From left to right: Petrus Honkanen, Seppo Heinonen, Jukka Arminen and Juha Liikaluoma. And an unnamed snake.

operations were transferred to subcontractors in Finland, China and Estonia. The expansion of the cooperation network allowed the company to balance peak loads.

Raute's transformation from a production unit into an assembly house greatly changed the mode of its operations.

"While design used to be an in-house resource, it is now in our subcontractor offices. That entails a lot of good, but it's also something we need to remain vigilant about," says Mika Hyysti.

Nevertheless, the changes in operations were fruitful. The Group's net sales grew by nearly one and half times in 2005. The strong growth was partly the result of improved processes, as well as new suppliers and partners, and partly due to a recovering market and demand shifting back from smallish improvement investments to investments of a larger scale.

The demand for plywood grew nearly everywhere in Europe, and Raute reinforced its leading market position in the segment of the plywood industry which relied on southern European poplar as its raw material. Demand grew particularly strongly in Russia, but the market

Owned by
three brothers,
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situation was also good, and the price level high, in North America. In Asia, development was slowed by the limited availability of suitable wood raw material and unstable social conditions. In China, demand for plywood grew strongly as a result of urbanization and the related construction.

“From record growth to record order books” wrote President and CEO Tapani Kiiski in the 2006 Annual Review. The year in question is indeed remembered as one of mill-scale projects at Raute. The first order was placed by the Chilean company Arauco. It was Arauco’s fourth mill project for which Raute delivered the main machinery. Another important order involving a mill came from the United States, when Murphy Company in Oregon decided to build an LVL mill. The third deal was made with the French company Thebault. Thebault, which was already a longstanding client of Raute, was building a new plywood mill in the South of France. *“A demanding line for a demanding client”* was how the Annual Review described the deal.

Owned by three brothers, the plywood producer Thebault already had three mills in France. The fourth mill under construction would be equipped with Raute’s lay-up line. The delivery also included a glue kitchen delivered by Lahti Precision (the former Raute Precision). Raute’s delivery as a whole raised Thebault’s glue lay-up to an entirely new level. Automation that enabled the rapid changing of product recipes had been added to stack changes and the monitoring of the veneer run. A manual and messy work phase was replaced by a glue station and automatic lay-up technology. Whereas the phase had previously required the labor input of four people, the new line could be run by a single operator. A similar gluing and lay-up technology had already been used in Raute’s LVL lines, but not in plywood production.

The record-breaking year also saw Raute adopting a new look. The revamp, launched on April 1, 2006, aimed to support sales and marketing, promote the strategy, and unify the company’s appearance. While the familiar logo was retained, the new look strongly emphasized its colors, blue, red, orange and green. Red stood for Raute’s courage and promptness, orange for its strength and colorfulness, and green for its authenticity and activeness. Blue symbolized a nice and accommodating workplace.



The colored lines in the registered trademark, designed by Professor Tapani Aartomaa in 2001, symbolize veneers.

A MILL IN CHINA

In September 2006, Raute opened a production unit in China, the world’s largest plywood producing country. The company had become acquainted with the local goods suppliers a few years earlier as it began expanding its cooperation network from Nastola to the world and was seeking production partners from different parts of the world.

When deciding the production unit’s location, the company turned its sights from Beijing to the Shanghai region, which had enjoyed strong growth and had a robust industrial sector. The new production unit was eventually opened in Nanhui, 40 kilometers from Shanghai, and enabled the company to offer increasingly flexible and competitive solutions in the Asian markets. The unit also delivered machines and machine parts for the entire Group, to Finland and the other subsidiaries. It employed 17 people and was led by Jarmo Enqvist.

The Shanghai unit had two roles. Given that labor and materials in China were so cheap, the company was able to improve its competitiveness by complementing its own technology with inexpensive components. Its other role was to penetrate the local markets with locally produced machines. So in Europe, the company’s competitive edge rested on high-technology products that conserved hands, energy and the environment, but in China it sold cheaper and simpler machines which were built in its own production unit and whose operation required more human resources.



Raute's stand at the industry's largest trade fair in Hanover in 2007. Raute's theme at the trade fair was the company's comprehensive expertise and the new thin plywood technology.

The company's comprehensive expertise was presented with a virtual tour of a plywood mill,



which gave the visitors an opportunity to browse the mill from one line to the next. The peeling and drying of thin veneer was demonstrated with a similar virtual experience.

Raute participated in the Ligna trade fair for the first time in 1981.

FROM THE CENTENARY TO A DEEP RECESSION

Raute celebrated its centenary in a merry mood in August 2008, just moments before the financial crisis which began with the collapse of Lehman Brothers spread across the globe.

“Raute has invested in product development throughout the decades and has developed a unique technological expertise. This has required a hundred years of systematic work. The family that makes up Raute’s chief shareholder has lived through times both good and bad with the company. The family’s commitment to the ownership has provided a basis for the company’s long-term development. Even today, the family’s shareholders are not content with following the company’s progress based on each quarter of a year. Instead, their perspective is much longer. A quarter of a hundred years is 25 years, after all. The family members currently on the company’s Board of Directors represent the third and fourth generations of the family, and the fifth generation is growing into its role of active ownership through the family’s regular get-togethers and conversations. Our family continues to be strongly committed to Raute. Our hundred years of experience tells us that this company is worth believing in,” said Sinikka Mustakallio, a member of the chief shareholder family and vice chair of the then Board of Directors, in her speech honoring the occasion in the festivities held in Sibelius Hall.

That faith was needed when the shockwaves of the recession hit the company and were felt all the way to the head office. Some deals which had already been made were canceled immediately. By the end of the year, it had become clear that the collapse of Raute’s market was much more drastic than the company had expected.

It was impacted by both clients’ caution and the financing situation. The dismal economic outlook reduced demand for clients’ products, reducing their willingness to invest in machinery. The financial crisis materially impaired clients’ possibilities to secure financing for their investments, due to which even necessary investments were at a standstill.

The flexibility achieved through structural changes was inadequate in the face of the exceptionally rapid and enduring drop in demand. After the cooperation negotiations held in the Group in concluded in late October, the entire personnel was furloughed for a maximum of 90 days. In addition, the company was forced to lay off a small group of people.

That faith was needed when the shockwaves of the recession hit the company and were felt all the way to the head office.

The net sales in 2009 declined by 63 percent year-on-year. For a brief period, the order books were at a historically low level as they plummeted to less than EUR 10 million.

This was because global demand for wood panel products had dropped steeply as a consequence of the recession. The mills of many Raute clients were running at less than half their capacity. In such a situation, there was naturally no need for investments in additional capacity.

Once again, Raute’s response to the weakened market situation was to sharpen its tools for the future and invest in product development. This time, the goal was to develop products with a rapid payback time, ones which would allow clients to enhance their production without sizeable investments. The leading thought was to provide clients with services that enabled them to improve their competitiveness and profitability without substantial costs.

When the situation later normalized, and demand for plywood and LVL technology returned to its previous level, the repercussions of the recession were visible in Raute exploring new segments for growth opportunities.

“The recession means that we must in a short period of time become a smaller and more agile company than we have been in recent years. We can recoup our losses only by also responding to the needs of our new clientele. To do this, we need both new products and a new ability to provide services,” read President and CEO Tapani Kiiski’s article in the personnel magazine in 2009.

One part of this new clientele consisted of competitors’ clients. Raute effected a strategic change which meant that it would also begin to modernize its competitors’ machines. The idea behind this was to make these clients, little by little and modernization by modernization, Raute’s clients.

“We will create added value for our clients by modernizing our competitors’ machines as well when necessary. Once the clients start thinking about new investments in the future, we’ll be in the frame,” Timo Kangas says, explaining the strategy.

“I’m absolutely convinced that the world will not be the same after the present recession subsides. In other words, the times will not return to what they were in 2006 and 2007. The entire world’s focal points will shift to new regions, especially China and India, but also to Russia, South America and other parts of Asia. In these

increasingly important markets, our clients’ values and investment grounds differ from in our traditional markets. To be able to achieve the kind of position in the new markets we have in our traditional markets, we must change. And this change needs to happen fast,” wrote Kiiski in his concluding words.

**NEW STRATEGY MOVED FOCUS
TO DEVELOPING MARKETS**

Raute’s Board of Directors adopted the company’s new strategy in late 2010. The new strategy moved the market focus increasingly to developing markets. The company also decided to concentrate solely on the producers of plywood and veneer beams. For them, Raute wanted to be a full service house that delivered entire mills on a turnkey basis.

“We want to operate closer to our clients than we currently do and to develop our ability to provide services so that we can profitably respond to all client needs. Our most important key to success is a competent personnel hungry for success,” is how the President and CEO explained the new strategy in the Annual Review.

The new strategy cannot be mentioned without paying attention to the environment. The company’s impact on the environment and the mitigation of climate change constitute one of the Group’s most important external acts of responsibility. Raute’s key environmental act is and has been to enable its clients’ more environmentally friendly production. A substantial volume of its clients’ production is used for construction needs. The carbon tied in wood construction reduces the climate burden considerably, whereas the production of other common construction materials increases carbon footprints. Raute’s technology allows its clients to engage in their own production while minimizing their climate impact. This is why the machines’ design considers the climate impact of the wood product industry from the perspective of Raute’s clients. By improving the efficiency of raw material use and reducing energy consumption and the use of additives, especially glue, Raute is helping its clients operate in more environmentally friendly ways. Among other things, Raute has developed dosing equipment that reduces the consumption of glue in a client’s end product. The equipment can be fitted to both new and old machine lines.

RAUTEPRO, RAUTESELECT AND RAUTESMART

The needs of companies in different parts of the world differ, and not all production units benefit from similar solutions. For Raute to provide each client with precisely the solutions that met their needs, the company developed different models for clients representing different levels of requirement. These were called RautePro, RauteSelect and RauteSmart. This is how they were introduced, first to the personnel and then to the clients: RautePro provides clients with reliable technology suitable for industrial production. Pro is especially suitable for developing markets in which production machines are not yet required to be greatly flexible. The investments in the machines are reasonable.

RauteSelect enables flexible production. RauteSelect is ideal for companies with an annual production capacity of 20,000–60,000 cubic meters and for companies that rely on several species of trees as their raw material. RauteSelect enables the production of quality products, introduces flexibility to production and provides machinery that makes efficient use of the raw materials. By modernizing RauteSelect, a machine can be upgraded to the level of RauteSmart.

RauteSmart offers clients with the industry’s latest and most efficient technology. A RauteSmart client has high production capacity. The line utilizes state-of-the-art automation, as well as identification and measuring technology efficiently. At its best, the turning speed of the product family’s flagship product, the RauteSmart lathe, is nearly 400 meters of veneer mat in a minute.

Nowadays, these products go by the names of R3, R5 and R7.

MEGA DELIVERY TO CHILE

In February 2012, Raute signed a deal valued at more than EUR 50 million. It was one of the biggest deliveries in the company’s history.

Arauco’s Nueva Aldea plywood mill had been destroyed in a raging forest fire. Arauco wanted to restore the damage done by the fire—2,000 lost jobs and its lost market share—as quickly as possible. The agreements on the machine deliveries with Raute were made a mere six weeks after the fire.

For Raute, this translated to an enormous financial leap.

“This year will see us ending a three-year string of lossmaking,” said President and CEO Tapani Kiiski in an interview with the industry

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publication Tekniikka ja talous. In terms of its magnitude, the order was equal to Raute’s half-year net sales and approximately 100 person/years. This was topped by the work performed by the subcontractor network. The volume of the work was so high that some retirees were even asked to come back to work. In many ways, Raute was provided with a pole position from which to start the design and delivery of the new mill. Raute had also supplied the principal machinery for the mill which was destroyed in the forest fire. In addition, for the past two years, Raute and Arauco had jointly been designing an entirely new plywood mill that would be located in southern Chile, and the designs for this mill could be used in the new project.

The new mill became more efficient than the one destroyed in the fire. It was built to be the most world’s most modern plywood mill.

Initially, the new mill’s capacity was 350,000 cubic meters of plywood a year produced from high-quality radiata pine. The novelties in the mill that improved quality and enhanced the use of the raw material included the automated calibrations of the XY block centering analyzers, the automatic veneer batching line, and Mecano’s latest microwave technology hygrometers and 3D camera sorting. The new features that improved production efficiency included the automatic piling of veneer pieces on the lathe lines, automatic stacking and robotic sealing lines. Spray gluing was replaced by line gluing, which reduced the costs of gluing.

MORE ORDERS AND PERSONNEL

Uncertainty in the world economy increased in 2015 due to China’s weak economic reports and forecasts, as well as political unrest. While the Finnish economy also suffered, Raute’s order books were bursting at the seams. The company had made a record number of deals early in the year, the value of which totaled EUR 84 million—and was fivefold compared to the previous year. Net sales grew by 64 percent during the first quarter.

“When others are laying people off, the Nastola-based Raute is hiring more people,” read the headline of an article published in the newspaper Helsingin Sanomat on June 15, 2015.

The Nastola factory moved from two to three shifts to make good on all its deliveries. The company had hired roughly 100 new people, and its personnel had grown to nearly 600.

The surprising aspect was that the large-scale orders came from Europe, even though the continent was supposedly already saturated with plywood and veneer beam mills. Perhaps one of the underlying reasons was the increasing popularity of ecological wood construction. After the record-breaking year in 2015, some expected 2016 to spell a quieter time for Raute. This was not to be. The year saw the order books reach another record level, even though the situation had looked quite different at one point.

“It may not be widely known that we came really close to a situation this summer in which we would have been forced to start adjusting our operations to drastically reduced orders. But the situation has since been turned on its head, and we received a record number of orders during the second half of the year. Thanks to them, our order book looks positively robust,” wrote the President and CEO in the personnel magazine’s final issue for the year.

While the worst crisis in Europe was over, uncertainty continued to plague particularly the banking sector in southern Europe, casting shadows elsewhere as well. In South America, weak demand in the home markets of Raute’s most important clients slowed down new investment plans. In China, uncertainty about the direction of the economy and political tensions caused instability in several market areas.

Despite this, new mill-scale projects got underway in the plywood and LVL industry, with Raute winning a deal in each of these. An order book valued at EUR 110 million marked a good transition to the company’s 110th year of operation.

CHALLENGES IN THE FORM OF WEAKER PROFITABILITY

In 2018, Raute’s solidly positive development continued for the fourth consecutive year. But although the company, spurred by its 22 percent growth, achieved a new record in its net sales, and the Group’s result was the best in Raute’s history, not everything was trending upward. For quite some time, both Raute and Finland as a whole had faced the challenge of weakened productivity and cost competitiveness. Over the past few years, to improve its position, Raute had already implemented measures that aimed to increase its productivity by standardizing and developing cheaper ways by which to produce stack and veneer conveying solutions, for example. But this was not enough.

For quite some time, both Raute and Finland as a whole had faced the challenge of weakened productivity and cost competitiveness.

“In the future, we must be able to achieve more results with less working hours in almost everything and everywhere within our organization. This does not mean that design engineers should move their mouses faster, or that we’ll start running instead of walking, because that could undermine the quality of our products and the safety of our operations. Rather, it refers to several promising development projects underway, one of which I’ll be introducing to you here,” wrote Mika Hyysti, EVP, CTO, in the personnel magazine Sisäkara before proceeding to present *“a vastly more efficient and increasingly visual reporting system”* which played an important role in improving productivity. Among other things, the new reporting system allowed the production of a report showing a product’s cost history within a matter of seconds by the simple click of a mouse or button. Before, compiling a report of this kind could easily take up to 30 minutes. This advancement now saves time for much more useful and productive work. In addition to the reporting system, the company is examining other work stages with an eye on the further improvement of productivity.

“These processes have been run in the same way for a long time now. I believe we can radically change some areas of the process in the future—for example, by replacing some parts of the current technology with 3D printing or by producing old technologies in a new way, thereby conserving energy,” says Hyysti, envisioning future advances.

Roope Eskola, in charge of research and product development, agrees. He thinks that the things that are easy from the perspective of product development have already been done.

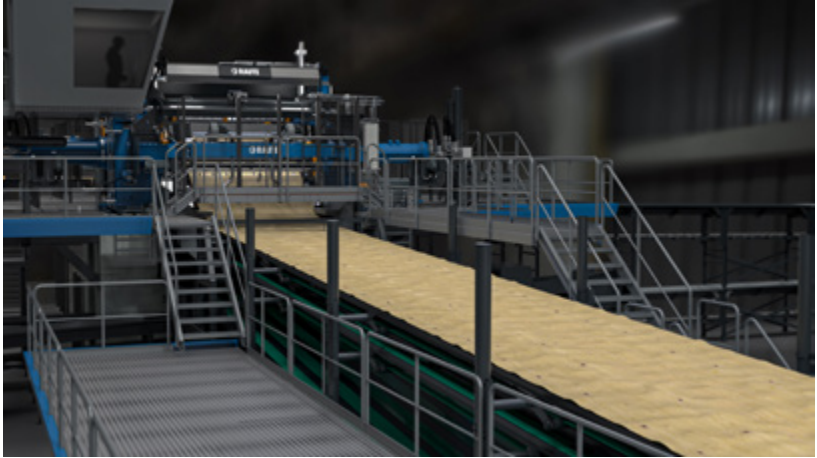
“Improving machinery and equipment with traditional engineering methods based on ‘make this slightly better’ has been largely exhausted. The big wins require another kind of approach and modern methods.”

This is why Eskola’s team is pursuing increased efficiency and cost savings through simulation. For example, aspects related to airflow can be reasoned up to a certain point, but real results require computational fluid dynamics.

“Computational methods allow us to discover aspects related to energy efficiency in particular. The efficiency of the new dryer launched a couple of years ago was optimized by means of flow calculations, for example. The new dryer’s production is more

The visualization of a lathe line based on a 3D model, illustrating the line in new machine colors. It shows a rotary-cut veneer mat and the working platforms. The lathe is in the background.

In addition to the reporting system, the company is examining other work stages with an eye on the further improvement of productivity.



consistent in terms of quality. It also increases capacity by 10 percent and reduces power consumption by 20 percent.”

“Roope’s team can simulate things very precisely and thereby make old technology by new means, saving a lot of energy in the process,” adds Hyysti.

Currently, all savings in energy are welcome. Investments among the company’s clients are driven by the green transition, alongside financial indicators. If you can execute something with 50 percent less energy than you use for it today, it may trigger an investment decision.

BRAND CLARIFICATION ALSO BROUGHT CONSISTENCY TO PRODUCTS

Raute has many longstanding clients, including second generation ones. Departing from previous generations, today’s clients are not brand-loyal. They must be wooed time and again, and this requires a clear brand. The large-scale brand revamp launched at Raute was completed just before the Covid-19 pandemic. Instead of machines, nuts and screws, the new brand is all about client values and the production plywood and veneer.

“Brand is the feeling you want to leave your clients with, and this is why every Raute employee and partner has completed brand training. Although Raute sells cutting edge technology, encounters always happen between people. And that’s why all communication and marketing is about people talking with people,” says Päivi Talonen, Raute’s CMO.



Päivi Talonen, CMO.

While Finnishness is still an important part of the brand, it is not highlighted. In the new corporate video, the company is said to be based in the North, rather than in Finland. Why? Because instead of nuts and bolts, Raute focuses on creating value in forest assets. People in the Nordic countries have always been surrounded by nature: we know forests. And Raute knows how to design machines that reduce energy consumption and improve wood recovery. The design guidelines for Raute machines, launched simultaneously with the revamped brand, help design engineers view a product as a whole, rather than just as a great many separate details.

“I hope this allows product owners and design engineers to see the fine technological solutions, which we used to deliver to clients on a project basis, increasingly clearly as individual products,” says Roope Eskola, Head of R&D.

Productization has already happened, but more of it is needed. The company should make the transition from a technology house to a product house, and the harmonization of the design principles is part of this process. In the same context, a shared, brand-supporting and recognizable look with Raute’s new machine colors was created for all products and product categories.

THE PANDEMIC TRANSFORMED OPERATIONS

“In 2020, we want to finalize the implementation of the new management structure, maintain and strengthen our leading position in our traditionally strong markets and strengthen our standing in the emerging markets. I believe we are in a good position to do all this,” wrote President and CEO Kiiski in the 2019 Annual Report. This was not to be. The Covid-19 pandemic, which first surfaced in China, spread across the globe and shut down societies everywhere.

At Raute too, everything—clients’ orders and work at the factory alike—ground to a temporary halt. The pandemic impacted investment readiness, but the recovery from it was fairly rapid. The recovery was helped by the already prevailing boom in wood construction, which only increased after the emergence of Covid-19. People wanted to get out of cities and towns, and second homes became the “new normal” for many people. Regardless, recovering from the pandemic took longer at Raute, given that the pandemic hit it harder than was at first believed.

“Raute Corporation, the technology and service company operating in the wood products industry, initiates cooperation negotiations in Kajaani and Nastola, Lahti,” ran a headline in the Yle Lahti news service on June 15, 2020.

Kiiski explains the situation at the time as follows: *“When our clients’ world began to move again, we were in a situation in which their mills were operating at full capacity, but they were unwilling to invest. The demand was viewed as a bubble resulting from the subsidizing and stimulus measures related to the pandemic. Furthermore, demand was running so high that a mill could not be shut down for a few weeks for the purpose of installing new machinery. And given that the mill could not be shut down, why order a machine that would enhance production?”*

Once again, the company weathered the crisis by adjusting its operations and pursuing new modes of operation and opportunities. Office workers and senior staff members were furloughed for a maximum of 90 days.

In 2021, light was again visible at the end of the tunnel. By the end of the year, Raute’s order book was at a record high level: EUR 158 million. The prices of several raw materials and components, as well as cargo rates, skyrocketed. In addition, operations were impacted by protracted delivery times and component-related availability challenges, but the same problems also affected the company’s competitors.

In the form of continuous travel restrictions, the pandemic complicated the supervision of installations, commissioning and maintenance work, and sales. This forced both Raute and its clients to take an enormous digital leap—and if not exactly overnight, then almost.

Group Vice President Timo Kangas notes that the coronavirus transformed the entire servicing and service concept. It made things that had previously only been dreamed about an absolute necessity and then the reality.

“We took an enormous leap compared to our competitors. The coronavirus accelerated the development of various digital tools, and we adopted a variety of remote services.”

One of these is the MillsIGHTS data collection system, installed in all Raute lines. The system enables the collection and analysis of data on whether there is variation between shifts, for example, or on

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the quality or yield of production and on the reasons for any downtime. And all this can be done remotely. The pandemic also affected installation supervision and commissioning. These have typically consisted of work that is carried out on a client’s site over a period of up to several weeks by a specialist, installation supervisor, fitter or commissioning engineer. Due to the pandemic, the company also had to learn how to take care of these tasks remotely.

The digital leap was facilitated by the fact that everyone everywhere was in the same situation. This was a compelling reason for finding solutions, because there was simply no alternative. And where there’s a will, there’s a way. During the coronavirus pandemic, Raute performed several mill acceptance tests and equipment commissioning measures remotely.

“This is a win-win situation for both us and our clients. There’s no travel, our time is used more efficiently, our capacity grows, and the clients’ costs reduce,” adds Kiiski, specifying that while travel to client sites will not end altogether, it will reduce a great deal.

The pandemic also changed marketing methods. The RxEvent concept launched by Raute in May 2021 moved product launches from trade fairs and exhibitions to the online environment. The interactive and free event enabled simultaneous discussions with veneer, plywood and LVL professionals around the world. Alongside the products, the event featured keynote speeches by specialists and covered topical subjects on the trends in wood construction, for example. The first live RxEvent ever proved a success. So even though the world will slowly recover from the pandemic, the RxEvent is here to stay.

FROM THE PANDEMIC TO A WAR

“Technology company Raute ponders what to do with EUR 80 million worth of Russian orders: ‘We can’t just drop everything where we’re standing,’” ran a headline on Yle news on March 10, 2022.

Russia had invaded Ukraine on February 24, 2022. The Western countries responded to the aggression by imposing significant financial and other sanctions on Russia. Like other companies, Raute made the decision not to enter into any new deals with Russian counterparties, but what was to be done with existing orders and the goods standing ready in the production unit’s yard, awaiting delivery? The company is looking for ways to overcome the situation and secure its future.

In the spring of 2022, Tapani Kiiski left the post of President and CEO after an 18-year career at Raute. For the time being, the company is managed by the Raute veteran Petri Strengell. Under his leadership, Raute is pursuing new growth opportunities.



STORIES FROM RAUTE

FUTURE MACHINE LINES WILL BE DESIGNED VIRTUALLY

Raute has invested in product development in both good and bad times. It has been a means to stand out and remain a market leader in the mill technology of plywood production.

Head of R&D Roope Eskola praises the company's top management for increasing the product development budget over the last five years. Even during difficult times, the euros earmarked for product development have been kept at a level at least equal to the good times.

"When I began working as head of the Nastola product development team in 2017, roughly a third of the product development engineers' working hours were spent on project work. That's understandable when you consider the company's history as a project house. These engineers had previously designed an equivalent if not the same machine, so it was natural for them to participate in

The future is seen through research and development. What was good yesterday may be good enough for someone today, but it will no longer do tomorrow, says Roope Eskola, Head of R&D.

project design. But you cannot create something new if a big slice of your time is spent on something else.”

Eskola therefore made the decision that it was his team’s task to create new products rather than to take part in project work. This has enhanced the company’s product development.

**CLOSE COOPERATION WITH
ACADEMIC INSTITUTIONS**

Under Eskola’s leadership, Raute has also shifted increasingly from pure product development to research. For several years now, he has invested in cooperation with universities and other educational institutions. In addition to thesis students, this means shared research consortium projects. In practice, the projects often involve a university gathering a group of businesses which together study and develop the topic on a larger scale. Inclusion in projects of this kind has required an active role and initiative from Raute.

“I’ve actively communicated to the academic world that Raute is at the cutting edge of technology in its own industry, and that the company does not focus on product development alone, but that research also plays an important role in our work. It can produce ideas that build our future competitiveness.”

Take 3D printing, for example. When the Finnish Additive Manufacturing Ecosystem (FAME) was established in 2019, Raute was one of its founding companies. The network enables Finnish industry leaders to share their knowledge on improving products’ competitiveness with the help of 3D printing. Raute represents one of the companies that use 3D printed components in their end products. The ecosystem’s other members include material suppliers, printer manufacturers as well as companies that provide additive manufacturing and design services.

“The ecosystem aims to improve the competitiveness of all participating companies by sharing knowledge openly within the network.”

Raute’s own goal is to develop its competitiveness by utilizing 3D printing in the production of machine components. Raute already uses 3D printed plastic and metal components in its machines. These components make the machines cheaper to produce, faster or more accurate, energy efficient and durable, and easier to service. The list goes on.

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“Given that Raute’s production is composed of either short-runs or machines customized to clients’ needs, it does not include that many repeats of a single item at the annual level. This low level of reproducing limits the use of different manufacturing methods; the costs of casting molds are high, for example, meaning they require higher reproduction rates. The printing allows us to produce even complex metal or plastic components cost-effectively, and moreover limit that production to a single piece if necessary.”

Eskola points out that 3D printing also enables the use of new materials—such as fiber-reinforced plastics and special metals like high-strength steel—in the company’s products.

Additive manufacturing is also applied in pursuit of savings. High-strength steel in itself is expensive, for example, and its machining is more expensive than that of conventional metals. In contrast, the prices of printing powders do not differ from each other a great deal, and the price is based on the printing time.

“The more you machine a piece, the longer the machining time it requires, and the price also increases in step with this. This prompts you to optimize the piece to be as light and strong as possible when designing it.”

Raute has initiated an 18-month project which aims to identify Raute machine components that can be replaced by 3D printed components. The focus is on components that include complex tooling or to which the printing could add new features. Examples include printing multichannel lubrication within a steel component. Such a system cannot be bored into a complex component with traditional methods.

**SIMULATED MACHINE LINES
AND FUTURE MILLS**

Roope Eskola, Head of R&D, notes that while the use of AI and machine learning in product development is still in its infancy, it will open entirely new doors for Raute.

“In the years to come, artificial intelligence and machine learning will enable us to be increasingly proactive. The data we gather will also allow us to improve how we guide our machines’ development. On top of this, AI and machine learning will allow us to find solutions for the most complex aspects of line control and analyzers.”



“The use of planted trees in veneer production is now increasing in developing countries as well, and their processing requires more sophisticated technology. We are now also developing cost-effective mill technology for developing markets, with our sights set particularly on Southeast Asia, China, Africa and Latin America,” says Roope Eskola.

He goes on to add that in the future, machine prototypes will be developed and tested in virtual environments. *“We already have a real-time simulator which imitates the plywood batching line in a virtual environment. It combines a model that simulates the machine’s mechanics and a virtualized computer vision system and the line’s automated control system. With this combination, we can test both the line’s mechanics and automation, and the computer vision’s software. We can also use the simulator in the development of our digital services and data collection.”*

Raute’s unit specializing in computer vision in Kajaani and the company’s engineers in Nastola can test equipment in the same virtual environment. The data moves in the same manner as it would move in a real machine. *“Testing the machines and making changes to a line is faster in a virtual environment. In the future, we won’t start preparing the production documentation before the line is how we want it to be, and its operation has been verified by virtual simulation.”*



The Nastola research and development team headed by Roope Eskola (far left). Next to Eskola, from left to right, are Tommi Uski, holding a photo of Hannu Tourneur, Mika Kunttu, Jussi Auvinen, Henri Venäläinen, Kai Seppänen, Sampo Nyysönen, Antti Pöysti, Juho Sihvo, Heikki Korpilahti, Ville Heimonen, Tero Mäkelä, Kalle Rekola, Mikko Salonen, Oskari Joukas, Jarmo Plattonen, Dmitry Gradov and Tomas Kiilakoski.

New products and technologies have always represented growth leaps. Eskola believes the time is ripe for virtual designing, and that this is where the next leap will be made.



Tapani Kiiski (Lic.Sc. (Tech.)) was Raute Corporation's President and CEO from 2004 to 2022. Before joining Raute Group in 2002, Kiiski, who lives in Hyvinkää, worked for Konecranes.

PROFILE

PUTTING OUT FIRES

Were Tapani Kiiski to describe his nearly two-decade job at the helm of Raute, he might very well use the words “putting out fires.” Back when he joined Raute in 2002 as its CTO, Risto Mäkinen was the President and CEO of the Group and Raute Wood, and the company had just fallen into the grips of a recession. The general uncertainty in the global economy and the resulting decline in investments had a strong impact on Raute’s net sales.

When Risto Mäkitalo announced his intention to step down in early 2004, Kiiski succeeded him as the President and CEO of the Group and Raute Wood. In many ways, the year in question was a time of changes for Raute. Early on, the company sold Raute Precision to its top management. During its 90-year history, the subsidiary had become one of the world’s top two raw material suppliers for the glass industry and Finland’s leading weighing industry company. The capital gain from the transaction was used in the development of the Raute Wood business area.

“Precision’s divestment sharpened Raute’s focus. Following the transaction, we focused on developing our core business and improving our competitiveness. We also built a network of cost-effective partners. It was a strategically good decision.”

Another major change that occurred during Kiiski's time was the investment in digitalization and automation.

Another major change that occurred during Kiiski's time was the investment in digitalization and automation. Kiiski notes that while Raute is still a machine shop, the personnel's expertise and clients' needs have changed completely. The same applies to the means of competitiveness and how clients are served.

“These days, machine and process properties, as well as competitiveness, are produced through automation. This does not mean we should belittle the machines—they must still be good, functional, durable and of high quality. But since everyone else can also provide such machines, distinguishing yourself from the competition with machines alone is more difficult than doing so based on how the machines work. This is achieved through automation and digitalization.”

Kiiski adds that the change has not concerned just Raute, but the entire industry. The processes are more automated and of a more consistent quality. The machines are safer and more ergonomic. Raute is the first veneer and plywood machine maker to automate one line after the other, but can a machine be improved ad infinitum? Kiiski believes that in terms of speed and precision, we are approaching the limits of development.

“The machines may not get much better any longer in terms of their mechanical properties, but in terms of their production, environmental and user friendliness, the speed with which they can be commissioned, and how flexibly they can be modified to suit different raw materials and end products—in this sense, we've only just started.”

Kiiski thinks that besides automation, Raute's future competitiveness will be influenced by its own modes of operation.

“If we fail to maintain and improve our cost competitiveness, we'll lose the game. Key examples of this include how productively and efficiently the organization works, how well sourcing is kept abreast of the required components, and how well clients are served, from start to finish.”

Over the past couple of years, Raute has changed its operating procedures and developed its internal processes and ways of working. The latest change in the company involves a large-scale renewal of its IT system.

“It will improve things greatly. The renewal's most important objectives are to increase the efficiency of operations and improve quality. We also aim to serve clients even better than before.”

CHINA, AN ETERNAL PROMISE?

In terms of Raute's future, Kiiski thinks the markets in China, Asia in general, South America, and India pose both threats and opportunities. China especially has represented an eternal promise, but will it come up with the goods?

“I think it's still possible. If the development continues as it has so far, China will become an industrial powerhouse. We've failed to gain a sensible foothold there because they do things cheaply, applying simple technology. We have nothing of value to contribute.”

What Kiiski sees as a potential threat is that the Chinese are quick to learn, and in many other areas of life, they have been able to raise their skills to a level the West has found acceptable.

“China represents an enormous opportunity if we can offer their market something that meets the needs of their environment and the level of their costs and skills.”

RautePro, RauteSelect and RauteSmart, designed for different customer segments, nowadays go by the names of R3, R5 and R7. Of these, R3 provides a solution suitable for the Chinese market.

“The R3 products are currently suitable for the developing markets in Asia and South America and for some Russian clients. They're still too expensive for China, but I believe the standard demanded in China will rise in step with the market's development. Our competitors' products are already catching up with the R3 series, and this will also help Raute.”

THE LITTLE BIG COMPANY

Raute is the only company in the world which masters the entire process of veneer, plywood and LVL production. While market assessments have deemed it the world's largest for several years now, it is still a small company on the global scale. Even on the stock exchange, it can be found under small cap stocks.

“We are too little to be big. This is something we've agonized over for years now. For us to be able to rise to the next level, the R3 category would have to expand and become as big as our traditional high-end expertise is. Looking at plywood production volumes, the R3 category would have to be as big as the R5 and R7 worlds are. We hold all the cards for this. We just need to find the competitive edge and operating modes that will take us there.”

Tapani Kiiski believes the war in Ukraine will result in as steep a drop in Raute’s trade with Russia as the collapse of the Soviet Union did in the 1990s.

Corporate acquisitions represent another opportunity for growth. But they also contain a challenge.

“There are not a lot of companies on the market that we could or would want to acquire. In addition, the way the sellers see it is that they possess products, technology or capacity for which we would have to pay. But our thinking is that we already have the products and some factories too. The only thing we’d like to buy is market presence, customer relationships and sales networks. Given that what we want to buy is not the thing the seller is selling, the price isn’t right.”

Tapani Kiiski believes the war in Ukraine will come to result in as steep a drop in Raute’s trade with Russia as the collapse of the Soviet Union did in the 1990s. Back then, the company teetered on the very edge, and the trade with Russia did not resume for another decade.

“This too could very well take another ten years or so. In any case, the sanctions will outlive the war. And even after them, the cooperation will be marked by a considerable lack of confidence. Even if we at Raute had the confidence and were willing to resume the trade, we would likely run into a lack of confidence among Western financiers, and restrictions on financial transactions and requirements.”

Expansion or no expansion, the future of the Group’s clients still looks bright. The popularity of wood construction is enjoying huge growth which, in turn, means new investments and opportunities for Raute. Although Russia will likely remain off the grid for years to come, there are still countries and continents in the world which have room for growth and demand for the world’s best machinery.

PRAISE FOR THE PERSONNEL

The world’s best machinery cannot be produced without the people who design and make them, sell them to the clients, understand the client’s production processes, and service the machines so that they will keep on serving the clients for years to come.

“Raute’s success is based on our having been able to recruit the right people for the right places throughout our history. We have long-term employment relationships and a good working atmosphere. Raute’s people possess an enormous amount of expertise in both wood technology and production processes. They understand the volume and grade of the veneer required for the performance of the things in the order book and the kind of capacity and loading each stage of the process needs. They can think outside the box and envision what a future mill and machinery will look like, and they have the courage to steer development in that direction. Lahden Rautaja Metalliteollisuustehdas Osakeyhtiö grew into Raute Corporation through perseverance, courage and a highly skilled personnel. These very same things will keep it at the top of its industry for another hundred years,” says Tapani Kiiski (President and CEO, 2004–2022).



“Lahden Rautateollisuus has always had an eager and loyal workforce,” said yli-insinööri Pauli Mustakallio in 1958, thanking the company’s workers in his 50th anniversary speech, held in the assembly hall of the area’s vocational schools. That was true then and it remains true to this day. The company has many long-term employment relationships and many former workers keep in touch even after retirement. One such group of retirees gets together

for a coffee once a month at the Lahti market square—and has been doing so for the past 20 years. Seated around the table, from left to right, are Kari Sintonen, Sven Forslund, Reijo Kaunisto, Raimo Seppälä, Timo Reinikainen, Aatos Niskanen, Pirjo Salomaa, Kauko Hyvönen, Timo Kurikka, Raimo Mikkola, Perttu Kähäri, Olavi Mainela, Tapani Saares and Hilikka Sintonen.

RAUTE'S ENVIRONMENTAL IMPACT IN 2021

1

The effects of human activity, such as logging, can damage forest ecosystems.

2

Raute's solutions enable the efficient use of raw materials and energy-efficient processes.

3

Raute helps its clients maximize the efficient use and value of their forest assets in a resource-efficient manner.

4

The value chain's challenge is to find a solution for replacing harmful types of glue. This also presents an opportunity for Raute.



RAUTE IN FIGURES

DECEMBER 31, 2021

SUBSIDIARIES

Raute Canada Ltd., Delta, B.C., Canada
Raute Inc, Delaware, USA
Raute US, Inc., Monroe, Louisiana, USA
RWS-Engineering Oy, Lahti, Finland
Raute Group Asia Pte Ltd, Singapore
Raute WPM Oy, Lahti, Finland
Raute Chile Ltda., Concepción, Chile
Raute Service LLC, St. Petersburg, Russia
Raute (Shanghai) Machinery Co., Ltd., Shanghai, China
Metriguard Technologies, Inc. Pullman, Washington, USA
Hiottu Oy, Oulu, Finland
Raute (Changzhou) Machinery Co., Ltd., Changzhou, China

HIGHLIGHTS IN 2021

Raute signed the UN's Global Compact initiative. In its operations, the company promotes the Ten Principles of the Global Compact, which concern human rights, labor, the environment and anti-corruption.

The company's operating procedures and clients' service processes were digitalized, and the company launched its virtual marketing events.

The first full year of operation at Raute's solar power station significantly reduced the carbon dioxide emissions generated by the company's own operations.

NET SALES EUR 142 MILLION
PERSONNEL 802
COUNTRIES OF OPERATION 10

1908
Lahden Rauta- ja Metalliteollisuustehdas Osaakeyhtiö is established. The company produces its first wood processing machines (frame saws).

1911
The company's name is changed to Lahden Rautateollisuus Oy. Henrik Schwartzberg begins his work as technical director.

1914
The company manufactures its first scales.

1916–1917
The new foundry is built.

1931
The company produces its first veneer manufacturing machines.

1943
The scales division is named Lahden Vaaka Oy.

1945
The furniture maker Sopenkorpi Oy is established.

1954
Sopekaluste Oy is established to market the furniture made by Sopenkorpi Oy.

1960
Lahden Vaaka Oy, Sopenkorpi Oy and Sopekaluste Oy are merged with Lahden Rautateollisuus Oy.

1968
A new factory is built in Nastola.

1974
A new sales office is set up in Portland in the United States. In 1978, the company's name is changed to Raute Oy.

1976
The company's foundry closes down.

1983
The company's name is changed to Raute Oy.

1984
Raute expands to the United States and Canada by acquiring Durand Machine Company Ltd. A sales office is opened in Singapore.

1988
Raute Wood Processing Machinery's operations move from Lahti to Nastola.

1991
The entire machine production of the Lahti factory is relocated to Nastola.

1992
Raute Group's business areas: Raute Wood Processing Machinery Oy, Raute Precision Oy and Sope Interior Oy.

1994
Raute Oy's A series shares are listed on the Helsinki Stock Exchange. Raute Interior is divested.

1995
A sales office is established in Santiago, Chile.

1998
The company's name is changed to Raute Oyj (Raute Corporation).

2000
The company acquires 49.9 percent of Mecano Group Oy's shares and the entire share capital of Jymet Engineering Oy.

2004
Raute Precision is divested.

2005
Raute Service LLC, which provides servicing and spare parts services, is established in St. Petersburg.

2007
The subsidiary Raute (Shanghai) Machinery Co., Ltd. is established in China.

2011
RautePro, RauteSelect, RauteSmart—Raute's solutions for different client needs—are introduced to the market.

2019
Raute's second service center is opened in Kirov, Russia.

2020
The first remotely conducted mill approval tests and equipment rollouts.

2022
Raute relocates its production in China to a new facility in the city of Changzhou.

MANAGING DIRECTORS/ PRESIDENT AND CEOS

1908–1910 Mr. P. Kuivalainen
1911–1912 Eetu Niemi
1912–1913 Ilmari Mellin
1913–1928 Edvin Kauppinen
1928–1938 Henrik Schwartzberg
1938–1970 Aarne Mustakallio
1970–1985 Heikki Mustakallio
1985–1992 Pekka Leppänen
1992–1995 Kari Airaksinen
1995–1998 Juha-Pekka Keskiaho
1998–2004 Risto Mäkitalo
2004–2022 Tapani Kiiski

THE HISTORY OF THE COMPANY NAME

1908–1912 Lahden Rauta- ja Metalliteollisuustehdas Osakeyhtiö
1912–1942 Lahden Rautateollisuus Osakeyhtiö
1942–1983 Lahden Rautateollisuus Oy
1983–1994 Raute Oy
1994–Raute Oyj (Raute Corporation)

THANK YOU!

This history would not have been written without the help of numerous former and current employees of Raute. Thank you for giving me your time, sharing your memories and bearing with me as I approached you with yet another set of questions, and for proofreading the text. You breathed life into the first decades of the company and descriptions of my great-grandfather Henrik Schwartzberg and Edvin Kauppinen, and helped me formulate an image of what life and work at the factory and foundry was like, what everyday life at the factory looks like today, and what the future Raute will look like.

Raute’s Raute’s journey to becoming one of the world’s leading suppliers of plywood machines, equipment and entire mills has entailed numerous deals, successes, failures, important people, significant product developments, initiatives, experiments, fantastic stories, and an infinite number of other relevant details this book was not able to cover.

All mistakes and inaccuracies that may remain on these pages are mine.

Sane Keskiaho

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Mika Hyysti, 1990–and further Raute Corporation
Matti Jokelin, 1979–2010 Raute Corporation
Timo Kangas, Raute 2004–and further Raute Corporation
Veijo Kauppinen, 1965–1980 Raute Corporation
Reijo Kaunisto, 1972–2003 Raute Corporation
Tapani Kiiski, 2002–2022 Raute Corporation
Lasse Kirmo, 1975–1989 Raute Corporation
Pekka Käki, 1973–2014 Raute Corporation
Pekka Leppänen, 1985–1991 Raute Corporation
Markku Lindgren, 1969–2019 Raute Corporation
Leena Lottanen, 1977–2022 Raute Corporation
Juhani Löfberg, 1969–2014 Raute Corporation
Olavi Mainela, 1972–2010 Raute Corporation
Olavi Mikkola, Schauman Wood
Mikko Mustakallio, 1984–1998 Managing Director;1998–2000 Research Scientist, Raute Corporation
Raimo Pyykkönen, 1984–2009 Raute Corporation
Timo Reinikainen, 1979–2022 Raute Corporation
Sauli Salmela, 1984–and further Raute Corporation
Raimo Seppälä, 1967–2000 Raute Corporation
Jukka Siiriäinen, 1987–and further Raute Corporation
Hannu Sinko, 1983–and further Raute Corporation
Petri Strengell, 1987–and further Raute Corporation
Tapio Strandberg, 1959–1994 Raute Corporation
Kyösti Suokas, 1968–2022 Raute Corporation
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