



THE FORESTS AND FORESTRY
OF
S U O M I
F I N L A N D

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OF

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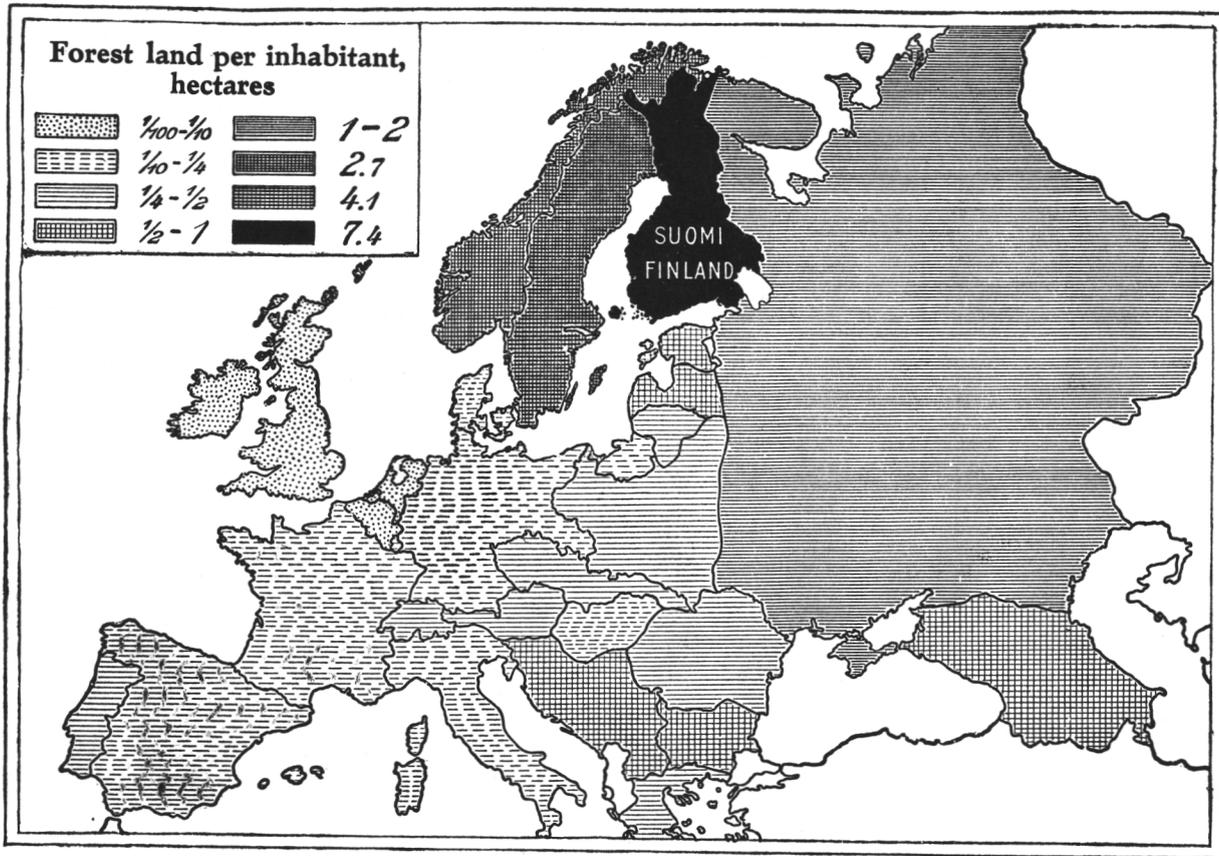
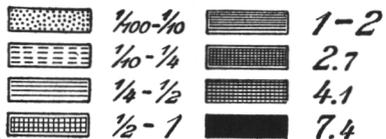
FINLAND

BY

N. A. HILDÉN

Forest Research Institute, Helsinki

**Forest land per inhabitant,
hectares**



Suomi, Finland, is, above all, a country of lakes and forests. If you look at a Finnish landscape, for instance, from an aeroplane, you find that forests cover the whole country like a green veil interspersed with thousands of blue lakes and the fields and meadows of inhabited regions.

As the country is one of the northernmost states in Europe, the greater part of Finland belongs to the so-called northern pine-forest climate. In the southern parts of the country, on the shores of the Baltic, there are, indeed, milder regions in which the oak thrives, but in the extreme North, near the Arctic Ocean, the polar timber line runs through the geographical territory of Finland. From the farthest forest outposts among the arctic mountains of Lapland right down to the shores of the Baltic forest covers the whole country uninterruptedly.

Superficial deposit, formed in ancient times by the glacial period, covers the ground almost everywhere in Finland, giving it a slightly hilly, undulating appearance. Mountain slopes and rocks only rise into view here and there and reveal the rock foundation, those hard primary rocks that are so poor in useful minerals. In North Finland, however, where nature is more imposing, the landscape often takes its character from the higher arctic mountains which sometimes raise their treeless tops to a height of more than a thousand metres.

Of the land area of Finland, 34 359 900 hectares altogether, 73.5 % is forest land, the waste land covering 14.7 %, and the rest, 11.8 %, consisting of cultivated land, etc. In Europe, Finland is the most richly wooded country from the point of view of the proportion of forests to the area of

the country, and it comes second as regards the total wooded area. There are in Finland 7.4 hect. of forest per head of population, i. e., considerably more than in any other European country (see map on first page).

Already owing to the fact that Finland extends to a great length from south to north, it is evident that, for climatic reasons, the conditions for forest growth are much more favourable in the southern parts of the country than on the icy shores of the Arctic Ocean. But the fertility of the country varies considerably even at the same latitudes, although the elevation of locality is a factor scarcely worth mentioning, at any rate in the southern parts of the country. The nature of the land is, indeed, much more barren in divide regions than on the shores of the watercourses and on the coast, where more fertile lands are often grouped. In the latter regions most of the tilled ground, as well as the oldest and densest population, are to be found. The forest growth is comparatively rapid here, in contrast to the divide regions, and particularly to the barren North Finland.

On account of the comparative flatness of the country, and because of the suitable climate, the forest lands of Finland have tended to become swampy. The peat bogs occupy no less than 35.7 % of the country's total land area, and it is calculated that 90 % of them consist of forest lands that have become swampy. Peat bogs are mostly to be found about the divides in North and East Finland. The quality of peat bogs varies considerably, for although the best fields can be got from the richest peat bogs by clearing, the poorest ones are useless even for forest growth. On most of the peat bogs some kind of natural forest grows, but about one-fifth of them are quite bare.

Not only the abundance of forests, but also their coniferous composition, is characteristic of Finland. The country's most important species of trees are pine (*Pinus silvestris*) and spruce (*Picea excelsa*). As a rule, pine grows on drier and poorer ground than spruce. Pine forests are most common throughout the greater part of the country. Spruce usually grows in the most fertile districts and in some places in North Finland, where spruce is the only prevailing species of tree.

In comparison with coniferous trees, the importance of deciduous trees is not so great, although birch (*Betula verrucosa* and *B. odorata*) is the third species of tree which, on the northern side of the timber line of coniferous trees, forms extensive pure forests. In the southern parts of the country birch appears nowadays mostly on grounds that have been burnt for cropping purposes, or where a forest fire has occurred. The same can be said of the occurrence of aspen (*Populus tremula*) and alder (*Alnus incana*). Many other deciduous trees, including hardwood trees in the southern parts of the country, increase the variety of the forests without, however, being of any great economic importance.

In regard to the proportion of age-classes, the forests of North Finland differ sharply from those in the southern part of the country. While, as a rule, the forests in the North are old and even over-aged, those in the South are mostly middle-aged, or young. The average rotation during which trees come to maturity, is considered to be 70—90 years in South Finland, but at least twice as long in the North.

Including bark, the growing stock amounts in all to 1620 million m³, solid measure. Not counting bark, the annual increment of the forests is 44,4 million m³. The figures for the surface area of the forest lands, the growing stock, and the forest growth, are as follows for the different species of trees:

	Proportion of land area		Growing stock		Annual increment	
	in %	in %	millions of m ³	in %	millions of m ³	in %
Pine	55.2		777.3	48.0	19.71	44.4
Spruce	24.8		480.5	29.6	12.26	27.6
Birch	16.9		318.5	19.7	10.80	23.2
Alder	1.5		21.0	1.3	1.42	3.2
Aspen	0.2		22.7	1.4	0.71	1.6
Open spaces ..	1.4		—	—	—	—
Total	100.0		1,620.0	100.0	44.40	100.0

It is calculated that there are 1557.4 million trees, measuring at least 20 cm at breast-height, in the forests of Finland. This figure is made up of 948.5 million pine trees, 434.9 million spruce trees, and 174.0 million deciduous trees.

In a silvicultural respect it is very characteristic of the forests of Finland that in comparison with, for instance, the conditions prevailing in Central Europe, the natural reproduction of the forests proceeds quite successfully. In spite of the fact that the forests of Finland have been dealt with in anything but a tender way for centuries past — they have been destroyed by forest fires, people have burnt them for cropping purposes, and, finally, they have been damaged by irrational cuttings, — there are comparatively few open spaces. Indeed, it has sometimes happened that from an economic point of view a less valuable species of tree, alder for instance, has become predominant, but, on the other hand, it is on burned grounds that the most beautiful and valuable forests of the country have sprung up. In most cases it is safe to resort to reforestation by means of natural seeding, provided favourable conditions are provided by cuttings and other measures. It is due to natural seeding that mixed forests are very general; mixed forests composed of coniferous trees and birch, in particular, occur frequently. The white birch trunks give the Finnish forest landscape, perhaps, its most characteristic feature, creating variety and beauty in the dark pine and fir forest.

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The Finnish forests, their growing stock, and the annual increment, are distributed among different owners in the following way:

	Land area		Growing stock		Annual increment	
	1000 hectares	%	millions of m ³	%	millions of m ³	%
State	13 634.9	39.7	603	37.2	9.50	21.4
Private	17 908.0	52.1	820	50.6	29.00	65.3
Joint Stock Companies.....	2 217.0	6.5	157	9.7	4.79	10.8
Communes, etc.	600.0	1.7	40	2.5	1.11	2.5
Total	34 359.9	100.0	1 620	100.0	44.40	100.0

As the most fertile regions were populated first in Finland, the most barren backwoods, which are thinly populated, have by degrees become the State forests of the present day, though they also include lands that have been bought from other owners. The main part of the State forests, situated especially in the barren divide regions in the northern part of the country, consists of meagre soil below the average, and their forest growth per unit is smaller than on private lands. This last fact is also due to the comparatively great average age of the State forests.

The State forestry is managed by the Board of Forestry, subordinated to the Ministry of Agriculture, the former attending also to other forest matters. The State forests are divided into four districts, comprising in all 90 supervisor-areas. The management of a supervisor-area is entrusted to a supervisor, assisted by assistant foresters, foremen and rangers.

The State forests supply a considerable portion of the raw material requirements of the Finnish wood-refining industry, and they constitute at the same time one of the most important sources of wealth and income of the Finnish State. — Large trees for sawing purposes are usually sold standing, the buyer himself arranging for the felling of the trees. Smaller timber has to an ever increasing degree been delivered by the forest administration ready for sale at some suitable point of transport. In this way it is expected that a rational management of the State forests will be achieved. The Board of Forestry also carries out a good deal of sawing in its own sawmills.

As the State forests are situated as a rule at less favourable places as regards transportation than private forests, energetic measures have been adopted for improving the transport facilities in this respect. The most important part of this work has been the improvement of floating channels, but attention is also devoted to the question, when new railway lines are being planned.

The State spends large sums of money annually on the draining of peat bogs suitable for forest cultivation. This is, indeed, of great importance in view of the fact that 41.4 % of the land area of the State consists of peat bogs, of which at least one-third, when properly drained, will yield good forests.

In contrast to the State forests, the privately owned forests are mostly situated in the southern part of the country and in districts, where transport facilities and the demand for timber are above the average. Here the forest lands are comparatively richer, as is indicated, too, by the figures in the statistical table above, showing that the private forests supply $\frac{1}{2}$ of all the growing stock in Finland, but $\frac{2}{3}$ of the annual increment.

The private forests in Finland are divided among hundreds of thousands of owners. Owing to the cold climate and to the fact that there are no coal mines in Finland, such quantities of timber are required for building and heating purposes that agriculture alone, without the aid of forest management, would not be profitable. In view of the great importance of private forests to the business for farmers as well as to the whole country, it is only natural that the State should have adopted effective measures for encouraging private forest management as well as for improving their yield.

The Forest Law now in force prohibits the cutting of old forest unless there are guarantees for satisfactory regeneration. Any other cutting of young forest than rational thinning is also prohibited. The control of the observance of the law is entrusted to 18 Forest Conservation Boards to whom each forest owner is obliged to report all fellings for sale on his lands.

Another important task of the Forest Conservation Boards is to work for silvicultural improvement of the private forests, mainly by providing the forest owners with competent and cheap, professionally skilled aid, and also by rendering financial aid, particularly to small farmers in their efforts in forest management. These boards are also entrusted with the care of the peat bog draining operations by distributing among private individuals the considerable contributions and loans that the State has recently granted for this purpose. — Although the Forest Conservation Boards have been established in a legislative way and receive considerable State support, they, nevertheless, base their activities essentially upon the voluntary efforts of the forest owners.

The lands owned by J o i n t S t o c k C o m p a n i e s belong mostly to wood-manufacturing establishments which have acquired large private lands, especially in the South of Finland, to ensure the supply of raw material. The forests of these companies are, as a rule, better managed than private forests. Indeed, the best managed forests in the whole country are, perhaps, to be found on the lands of some of the largest Joint Stock Companies.

Taking the country as a whole, the e c c l e s i a s t i c a l a n d c o m m u n a l forests are not of any great importance, but they may mean a great deal to the finances of their owners. Rural communities are now endeavouring to acquire possession of forest areas, thereby creating for themselves a strong economic foundation.

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The highest e d u c a t i o n i n f o r e s t r y in Finland is associated with the State University. The studies which comprise, besides scientific teaching, two summers' practical training, last 3—4 years for the forestry examination. Candidate (Master) and Licentiate (Doctor) examinations may also be passed in forestry at the University. — For the more elementary teaching of forestry there

are four Forest Schools, established in different parts of the country. After having passed a two years' training course, the graduates are employed by the State, or by private forest owners, as foremen. At one forest school short training courses are arranged annually in forestry for forest owners.

Intensive forest research work has been carried on in Finland during the last few decades, as a matter of course in a country, where the forests constitute the most important national wealth. At the Forest Research Institute, subsidised by the State, steady work is being carried out for the solution of several important questions. As the biggest work of this kind the general survey of forests in 1922—23, covering the whole country may be mentioned. The figures now published are also based upon the results of this survey. A voluntary association, *Suomen Metsätieteellinen Seura* — the Society of Forestry in Suomi (Finland) — has, during its 20 years' existence, seen many excellent results of its work. Altogether more than 50 serial volumes have been published both by this Society and the Forest Research Institute. The scientific investigations of Finland's forests have attracted attention even outside the borders of the country.

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It should be clear from the above that the forests of Finland, already on account of their extensiveness and abundance, occupy a prominent place in the economic life of the country. But this is also due to some other factors. In the first place the species of trees growing in the forests of Finland, yield first class timber material which, in its refined shape, is in great demand in foreign markets. Finnish timber is, on account of its comparatively slow growth, very well-known for its strength and durability. Further, timber transport facilities are favourable in Finland. There

is a moderate fall of snow in the winter, when the felling and hauling of trees can be carried out even under difficult topographical conditions. During the winter timber is hauled by horses to the banks of innumerable rivers, streams, and lakes. At the breaking up of the ice in the spring the watercourses are everywhere ready to take over the transport of timber. An almost unbelievable amount of timber is floated annually along the watercourses in Finland, and this method is a very cheap one. For hundreds of kilometres the logs pass down roaring rapids, across blue lakes and down powerful streams, arriving finally at the wood mills, usually situated along the coasts, and principally at those places, where the large watercourses empty themselves into the sea. — The continually extended network of railways completes the transport facilities offered by nature.

The influence of the forests upon the country's economic life is manifold. It was pointed out just now that agriculture was not profitable in Finland unless combined with forestry, on account of the great consumption of wood for household use. Besides the direct benefit, the country people derive a substantial source of income from all kinds of logging and floating work, particularly in the winter and part of the spring, when there is very little agricultural work to be done in snow-covered Finland. However, by supplying wood as raw material for certain industrial purposes, the forests influence the economic life of the country in the highest degree. The wood refining industry and, closely associated with it, the paper industry, constitute the main part of Finland's industries. No less than 47 % of all the industrial workers of the country were employed in 1927 by these industries, and their productive output represented 46 % of the value of the whole industrial production of the country.

In general, the employment of the raw materials provided by the forests for the Finnish wood refining industry, is carried out in such a way that the larger pines and spruces are converted into deals, boards, etc., by the sawmills, whilst smaller spruces and the tops of the coniferous trees, as well as the coarse waste obtained in sawing, are made into mechanical pulp and

cellulose as well as into paper. Birches are turned into plywood and spools, whilst aspen are sent to match factories. All kinds of less valuable trees, as well as mill waste, are also used by the mills as one of the most important forms of fuel. The State railways are run mainly on firewood. — In addition, the mills utilise the »white coal» of the numerous rapids to a great extent as a source of power.

The wood refining industry has no difficulty in satisfying the country's own needs. Indeed, the greater part of the productive output is intended for export abroad, and the forest products are the most important export articles of Finland, their value last year amounting to 80—90 % of the value of the total exports. During the last three years the following quantities of timber and refined woodgoods were sent abroad:

	In 1926	In 1927	In 1928
Sawn goods, Stds.	1 126 000	1 283 200	1 146 500
Round timber, m ³	3 538 100	4 368 100	3 876 300
Plywood, tons	50 498	57 202	82 882
Spools, »	6 033	5 744	5 559
Paper, »	210 091	223 466	243 807
Chemical pulp, »	332 600	363 572	473 023
Mechanical » »	115 131	140 424	182 965

England is the largest timber buyer. Besides, Holland, Belgium, Germany, and France, all buy considerable quantities of timber. Many tens of thousands of standards of timber are also sent annually to Spain, Denmark, and South Africa, not mentioning other countries which buy smaller quantities. Besides these countries, Russia, the United States, South America, and China, are also among the buyers of paper products. The countries across the Atlantic are constantly increasing their purchases, particularly of pulp.

While Finnish timber, from the point of view of its mechanical properties, yields first-class sawn goods, it is at the same time a very suitable raw material for the cellulose and paper industry. This fact, combined with the highly developed manufacturing methods, have made Finnish products of this kind known as the best obtainable. A special product, which deserves mention, is bleached sulphite cellulose which is the most important raw material for the manufacture of modern artificial silk.

The forests are the most important national wealth of the young Finnish Republic, and their successful, permanent utilisation is one of the corner stones of the country's economic prosperity. But the timber and woodworking manufactures produced in Finland are also, as was just pointed out, of importance to many other countries which nature has not endowed with sufficient forest resources. Thanks to the means derived from forestry and the wood refining industry, Finland, on the other hand, is able to buy abroad such commodities as cannot be produced in this country of the North.



Lake district from an aeroplane

PUNKAHARJU



Bird's-eye view of Finnish river and forest landscape from a height of 500 metres

VALKEALA



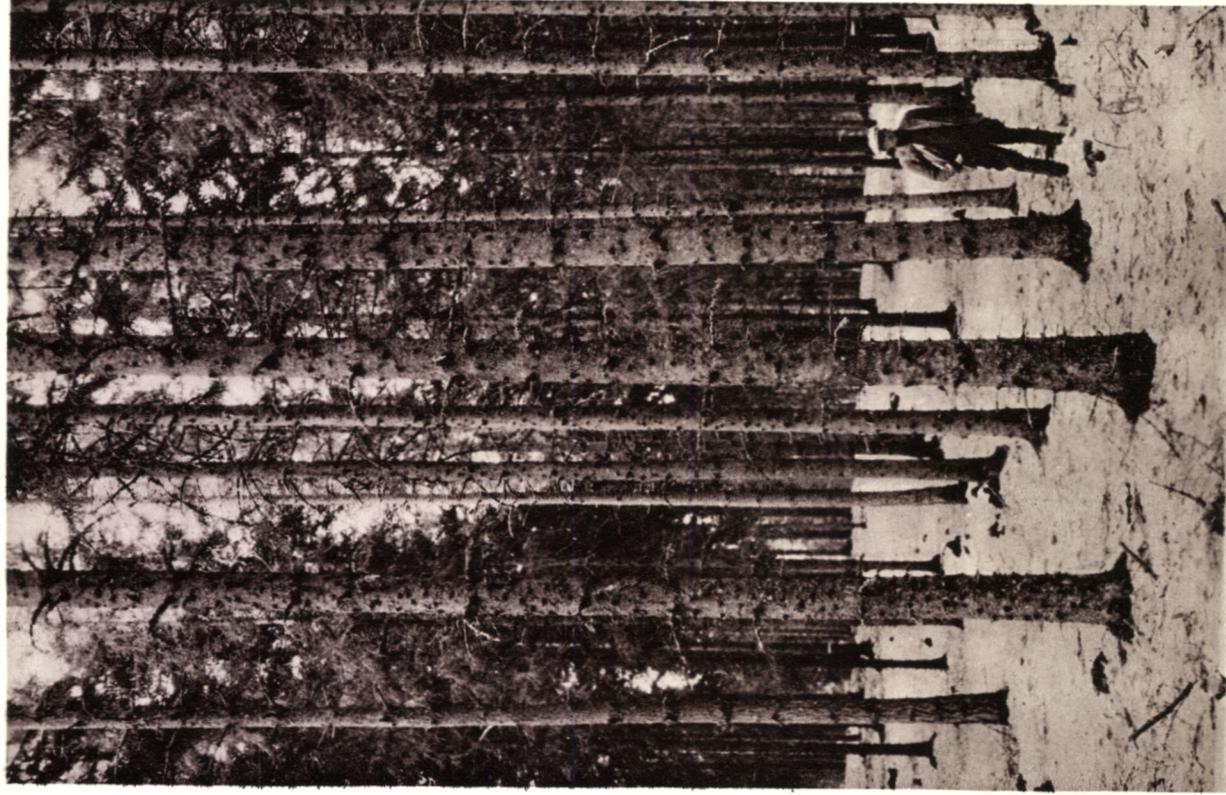
Waterfall in the fjeld district

PETSAMO



Mature pine forest

MÄNTTÄ



Even-aged spruce forest

PADASJOKI



Beautiful 40 year old birch forest

HEINÄVESI



Pine seedtrees in winter

TUUSULA



Regeneration felling in spruce forest

URJALA



Felling waste being burned to facilitate regeneration

VILPPULA



Ditch made for forest growing on a peat bog

PARKANO



Felling and preparing timber in winter

KEURU



Hauling logs by horses

KUOREVESI



Floating by stream

MULTIA



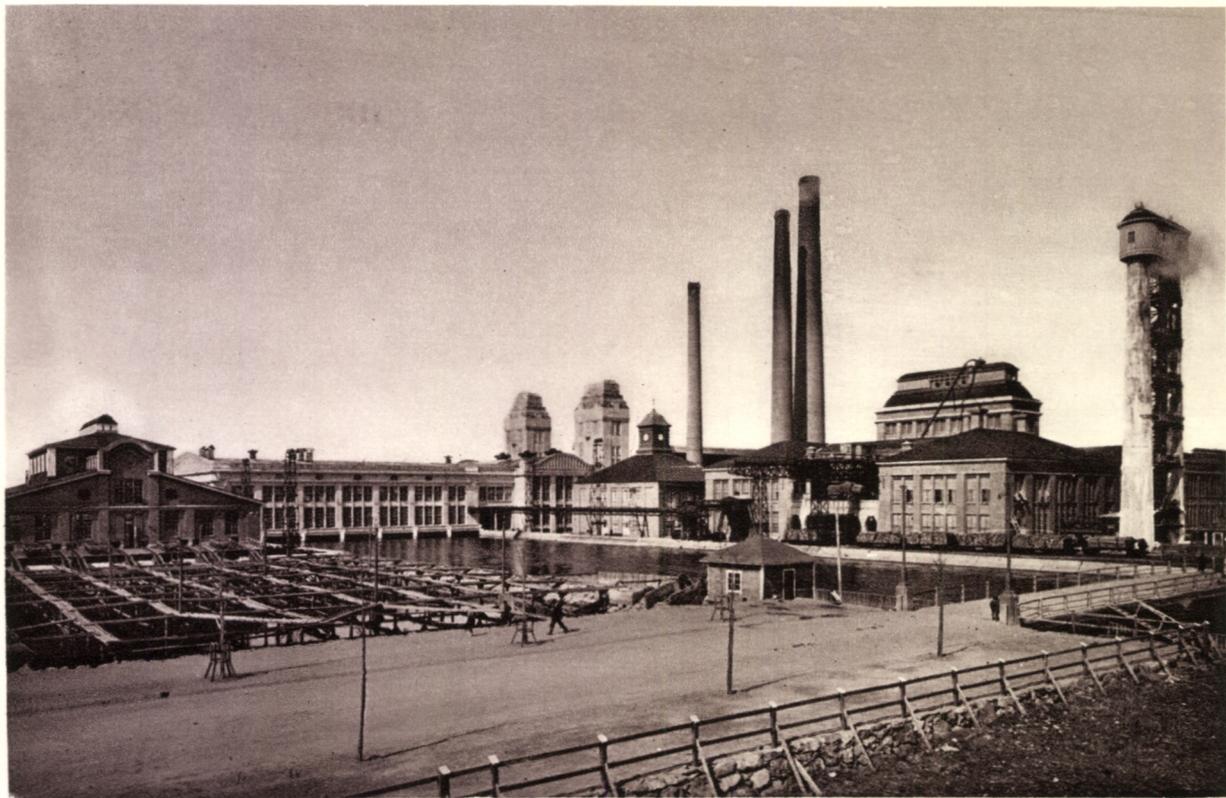
Timber floating on a lake

HÄMEENKYRÖ



A mediumsized sawmill

KOTKA



A pulp and paper mill

VARKAUS

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