

INDUSTRY AND THE LOCAL ECONOMY: CHANGING
CONTACT PATTERNS WITHIN THE LULEÅ DISTRICT
DURING THE NINETEENTH CENTURY

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Landscape changes have been studied in great detail at the level of the agricultural village, taking up changes in the local agrarian organization, land use and settlement patterns. At a wider regional level, however, the landscape has usually been affected by a variety of other factors, over and above those of agricultural methods and organization. This is particularly true in northern Sweden during the nineteenth century, when industry set its imprint on the landscape and economy both within and beyond the domains of the agrarian-based communities near the coast and in the lower valleys of the major rivers. The extensive forested territories of the interior, hitherto less accessible and largely devoid of permanent settlement or pronounced cultural impact, began to be markedly affected by man's quest for resources. Instead of the earlier, pre-industrial balance between man and nature, intensified economic activity began to pervade the primeval forests and sensitive mountain environments—not simply for local or national needs, but to supply the seemingly insatiable demands for raw materials from the great concentrations of population in Europe's rich farmland and industrialized coalfield areas. This short study aims to demonstrate some of the effects of this technological and socio-economic changeover on contact patterns relating to home, place of work and local commerce, in the lower valley of the Lule river in northern Sweden.

The huge catchment area of the Lule river extends from the mountain and tundra zones, through the sub-boreal forests to the still-emerging coastal plains flanking the Bay of Bothnia. Prior to the nineteenth century, permanent settlement was mostly in the form of villages, which were largely confined to the more fertile coastal zone where conditions were best for agriculture, fishing and maritime trade contacts. The primate settlement was (and still is) the town of Luleå, controlling the mouth of the river and serving as a typical gateway port and administrative centre for the vast interior. In these latitudes, agriculture alone has rarely been able to provide sufficient income for subsistence and taxes, so that subsidiary means of livelihood have traditionally played important roles in the region's economy. The surpluses from livestock farming, fishing, sealing, hunting, Lappish trade, tar-burning and the handsawing or hewing of timber, had long provided the necessary commodities for an export trade, which facilitated the import of foodstuffs, salt and other essentials to support an otherwise precarious life in these northern climes.

An analysis of the export trade of the Luleå district reveals long-term changes in the relative importance of a succession of products (Fig. 1). The nineteenth century saw both a continuation and an acceleration of this process of change, as the traditional agrarian products gave way first to a proto-industrial and then to a truly industrial utilization and processing of local forest and mineral resources (Fig. 2). Unfortunately it has not proved possible to differentiate between the timber that was sawn by hand, or by water — or steam-powered sawmills; however, the district's steamsaws

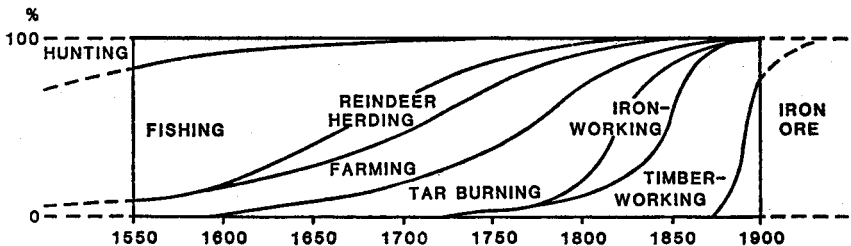


Fig. 1 — A model of the sequence of long-term changes in the trade economy of the Luleå valley.

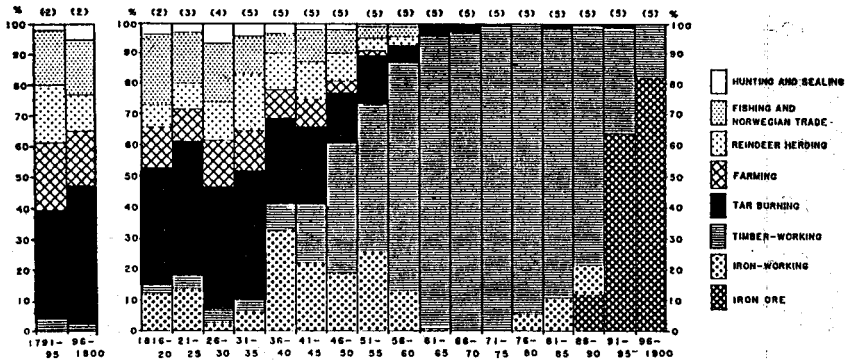


Fig. 2— Changes from traditional to industrial commodities, as shown by relative value of Luleå's export trade during the nineteenth century.

Sources: Luleå's domestic export trade 1792-1861 from the town's fiscal records (*Stadens enskilda räkenskaper H: 1, Luleå stads arkiv, Härnösand Landsarkivet*); Luleå's foreign trade 1790-1900 from customs house summaries in the Board of Trade records (*Utrikeshandel ser. 4, Kommerskollegiets arkiv, Riksarkivet*).

increased rapidly in number and capacity after 1860, especially during the boom of the 1870s, and the latter decades of the century saw the demise of virtually all of the exporting watersaws. The 1870s mark the take-off of industrialization in the Luleå valley as, in addition, the iron industry was reorganized around the Altappen rolling mill, steamships took over from sail in the export trade (c. 1880) and railways were constructed (1887-92). These technical innovations within industrial processing and transportation gave rise to an enormous upswing in the rate and extent of resource utilization, which gave new employment opportunities not only to the local «landless» population but also to both seasonal and permanent migrant labour.

POPULATION GROWTH

After the fall in population in connection with the disastrous war with Russia (whereby Sweden lost Finland in 1809), the Luleå district experienced continuous growth throughout the rest of the century (Fig. 3). This expansion was traditionally explained by «peace, vaccination and the

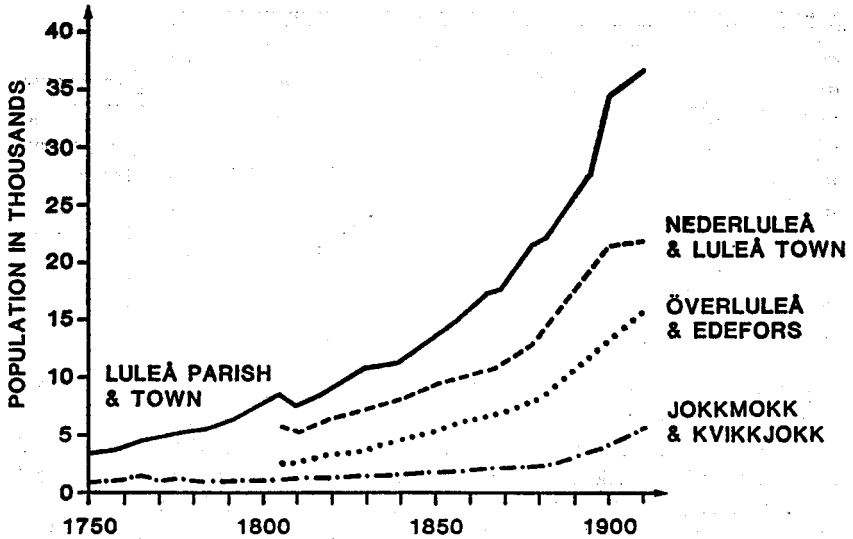


Fig. 3 — Population changes in the Luleå district.

Source: census data from *Tabellverket 1749-1859* and *Folkräkningar 1860-1910*.

potato», but other factors probably need to be considered. Recent research has shown, for example, that nineteenth century improvements in hygiene and the revival of breast-feeding decreased the rate of infant mortality by half in the neighbouring district of Nedertorneå (BRÄNDSTRÖM, 1984); the new employment opportunities offered by the new industries may have permitted earlier marriages among agricultural workers, thus increasing the possible size of families; furthermore, industrial labour requirements often exceeded local skills and resources, occasionally resulting in immigration of workers during initial and expansive phases of technological change.

Below the Lappmark boundary the population more than doubled between 1815 and 1870 (from 8,379 to 17,837) and then redoubled by 1900 to reach 34,620. This growth resulted in the need for new church centres as settlement spread farther inland, remote from the old church at Gammelstaden (Fig. 4). In 1831, therefore, the old coastal parish of Luleå was divided into Nederluleå (still centred on Gammelstaden)

and Överluleå, the latter obtaining its own church in Boden. This village lay more central to the most populous farming district in the new parish than did its rival, the former market village of Heden. For similar reasons, Överluleå was itself subdivided in 1881 and the northern half became the new parish of Edefors, with its church at Harads (opposite the sawmill at Bodräskfors). The establishment of these new parish churches clearly must have altered the social contact patterns, by regularly bringing together local populations that in earlier times had only been required to make monthly visits to the old parish centre in Luleå Gammelstad (BERGLING, 1964, p. 371).

By 1900 the growth of the town of Luleå and its suburbs (e. g. Svartöstaden near Svartön), and of the new municipality of Boden, clearly indicates the urbanization process then at work (Fig. 4). This urban expansion meant that the cash flow thus increased in town as well as in the countryside and, as the numbers of potential customers grew, the establishment of retail and other services was encouraged.

CHANGES IN INDUSTRIAL LOCATION

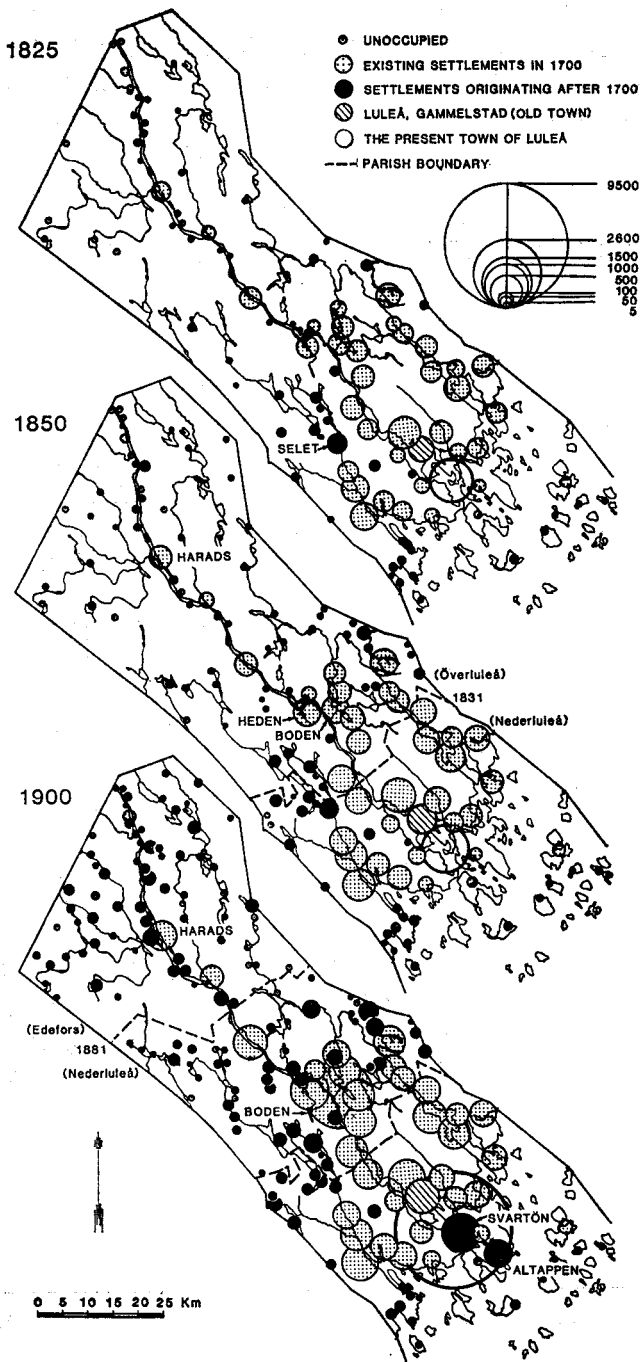
The lower Luleå valley experienced a succession of industries during the nineteenth century, illustrating three technological cycles nesting within the timber product cycle, which peaked in 1897. Figure 5 shows that around 1805 the district contained five coarse-bladed sawmills (mostly owned by villages); together with two ironworks and one fine-bladed saw owned by the pioneer industrialist, Baron S. G. Hermelin. They were all located peripheral to the domains of the old farming villages; in order to have access to the relatively untouched forests belonging to the Crown. In association with the Selet ironworks, new settlements were rapidly established in the vicinity (Fig. 4) — the settlers supplying the works with charcoal and transport services. The ironworks at Övre Svartlå were short-lived, however, and the nearby forest (originally set aside for charcoaling purposes) was allowed to be used to supply the large export sawmill at Hedensfors. By the 1860s, the number of commercial fine-bladed sawmills had risen to

14, and they were almost all located outside the old agricultural areas on suitable fall sites downstream from the forest resources that they wished to utilize. Not only the logs but also the sawn planks were floated on the Lule River and its tributaries, as overland communications and means of transport were still lacking. By the turn of the century, the three remaining watersaws had virtually ceased operations and production was focused primarily on six large steamsaws near Luleå (at the mouth of the major river) and, on a smaller scale, at two saws near the railway junction at Boden. These locational shifts were in response not only to changes in sawmill technology but also to new transport possibilities, new raw material supplies and the availability of labour.

MERCHANT CONTACTS

The region's trade remained principally in the hands of the town merchants during the early decades of the nineteenth century. Unfortunately, no merchants' account books appear to have survived for the town of Luleå; nevertheless, their extensive contact nets can be reconstructed from estate inventory deeds (*bouppteckningar*), which record detailed lists of a merchant's debtors and creditors at the time of his death. Figure 6a shows the contact field of one such merchant, Abraham Stenholm, who died on the 7th of May 1821 (LAYTON, 1982). As was common in the two previous centuries, he owned booths in the coastal market settlements of Luleå town, Råneå and Kalix, as well as in the markets at Jokkmokk and Gällivare in Lappmark. At his time of death, most of his dealings with the Lapps appeared to have been settled up, so that only a few debts were recorded. In the coastal districts, however, 532 individuals were still in his debt; of these, 380 lived in the coastal and riverine farming villages and even in the new isolated homesteads that were beginning to appear in the relatively unexploited forest areas.

Towards the middle of the century many of their contact



fields had begun to be somewhat reduced in scale and area. P. A. Lange's estate inventory of 1842, for example (Fig. 6b), recorded no more than 221 individuals with outstanding debts, and for the most part they lived within 35 kilometres of Luleå (i. e. Nederluleå). Only 28 of his debtors came from Överluleå parish, probably as a result of the introduction of new industry-based systems for the distribution of imported necessities (e. g. foodstuffs, tobacco) and for the production and export of the new products of bar iron and sawn timber, which took over from the merchant-dominated tar trade (see Figs. 8a & 8b).

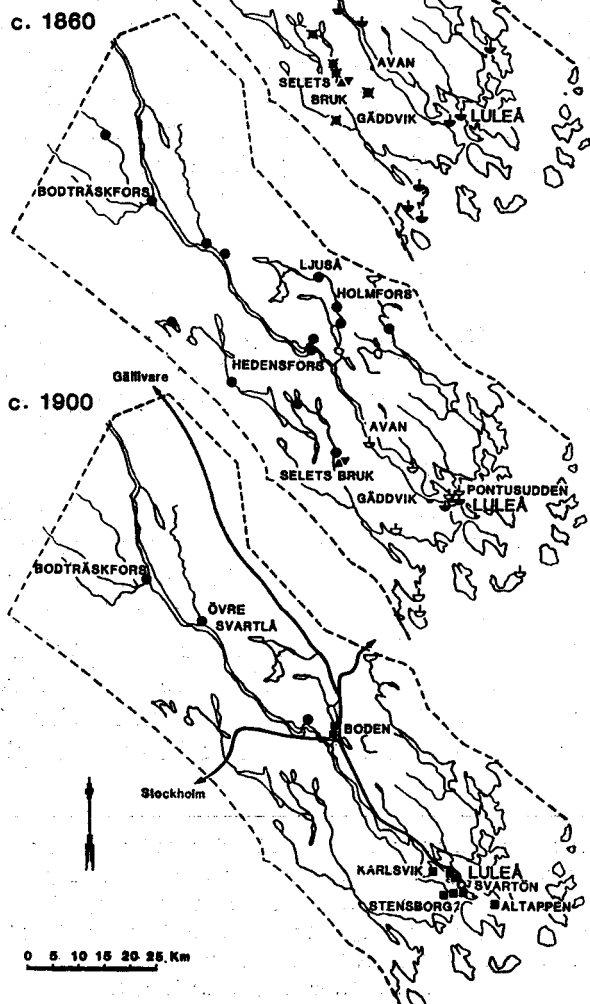
The gradual erosion of the town's monopoly on local trade was accelerated through the legislation of 1864 which relaxed restraints on local trade and handicrafts, enabling new retail and service facilities to be established in the countryside. By the 1860s, population growth in villages near to the watersaws had increased both the need and the opportunities for new businesses, which were rapidly established either by the town merchants (in the form of filial branches) or by local entrepreneurs. Figure 6c shows the 1867 contact net of the Boden merchant and sawmill owner, C. J. Sundström. His customers numbered 310 and came principally from the large farming villages within 20 kilometres of this growing centre, but also from the new settlements that were springing up further inland, in what was later to be the parish of Edefors. This typifies the new pattern of retailing that arose after 1864, when Boden began to expand as a retail and service centre. After this, the local mercantile system of wholesaling and retailing (cf. VANCE, 1970) began to be increasingly dominated by internal trade in foodstuffs and consumables, rather than in industrial products, and new patterns and hierarchies emerge along the lines of central place theory.

Fig. 5 — Proto-industrial and industrial locations in the Luleå district
1805, 1860, 1900

c. 1805

- ▲ BAR IRON WORKS
- ▼ BLAST FURNACE
- ✕ WATER SAW (COARSE-BLADE) 1801
- WATER SAW (FINE-BLADE)
- STEAM SAW
- ↓ SHIPYARD
- ⊕ SHIPYARD 1830s-50s
- ORE ENRICHMENT PLANT
- RAILWAY

c. 1860



c. 1900

0 5 10 15 20 25 Km

THE DIFFUSION OF RETAILING

This period also proved to be transitional with regard to the organization of local trade. The traditional system of seasonal markets, visited mainly by the wholesale/retail merchants based in Luleå, gave way to a new system of local general stores open throughout the year in all of the main settlements — both market towns and villages.

Employment in the forest-based industries was still to a large extent seasonal, but it provided an important new source of income. Although rural farmers and labourers were mostly paid in kind (e. g. foodstuffs, tobacco, coffee, textiles), the flow of cash began to increase. This was undoubtedly an added incentive for the setting up of country stores and businesses which could effectively obtain local monopolies (based on their locational advantages in terms of ease of access and convenience, in comparison with the more distant town of Luleå). The gradual improvement and extension of the road network during the nineteenth century made it easier to transport supplies inland from the port of Luleå in greater bulk — a factor which greatly facilitated the location of retail businesses to outlying settlements. It was against this background that the new general stores were established, forming a network wherein only the smallest hamlets and farms lay more than 5 kilometres away.

The ban on free trade in food supplies was lifted in 1815 and the old restraints on the Swedish domestic economy (*näringsstånget*) were further relaxed in 1846. Among other things, it then became possible to obtain permission to establish stores for the sale of general merchandise (*lanthandeln*) and to set up handicraft production in the countryside — except for within 30 kilometres of a town. The Luleå merchants and craft guilds, however, were still very reluctant to

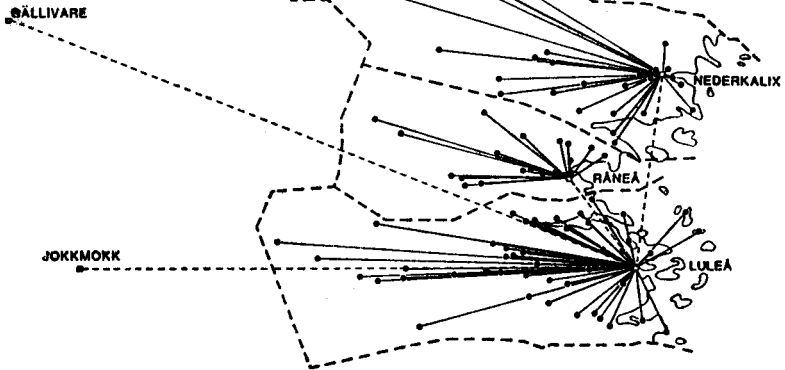
Fig. 6 — Merchant contact nets: (a) and (b) based on lists of debtors and creditors in estate inventories made after the death of property-owning individuals; and (c) based on an account ledger.

Sources: (a) & (b) from respective *bouppteckningar*, Luleå stadsarkiv, Härnösands landsarkiv; (c) the Sundström family archives, C 175 Enskilda arkiv, Härnösands landsarkiv.

A

1821

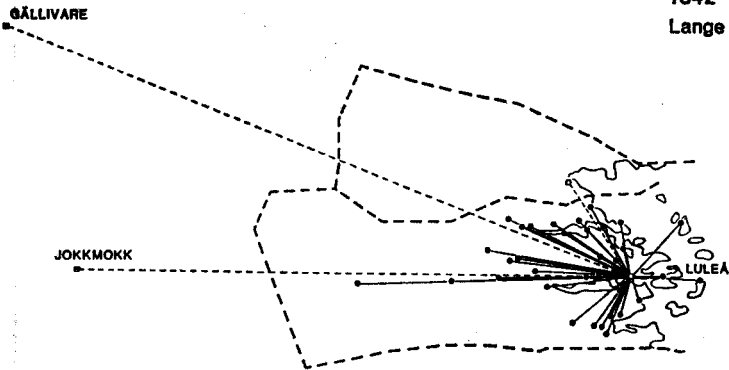
Abraham Stehholm



B

1842

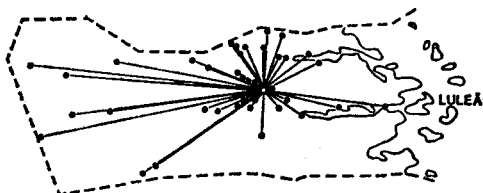
Lange



0 10 20 Km

C

1867

C.J. Sundström
(Boden/ Holmfors Saw)

sanction permission for «unqualified» persons, so that few newcomers appeared.

In Norrbotten, and particularly in the region of Luleå's former trade monopoly (or «*handels-gebiet*»), the number of small merchants and craftsmen in the countryside increased most rapidly, however, after the 8th June 1864 — when even greater freedom to establish new retail businesses was granted (Fig. 7 & Table 1). According to a list of persons registering new businesses in Norrbotten, there were 68 applications (59 for trade and 9 for craft activities) made within the county of Norrbotten in 1864 (Table 1). Of these, 46 were located in the traditional hinterland of Luleå, especially in the more densely population villages of the coastal parish of Nederluleå which lay within 30 km of the town and thitherto had not been allowed to establish crafts and retail services. The fol-

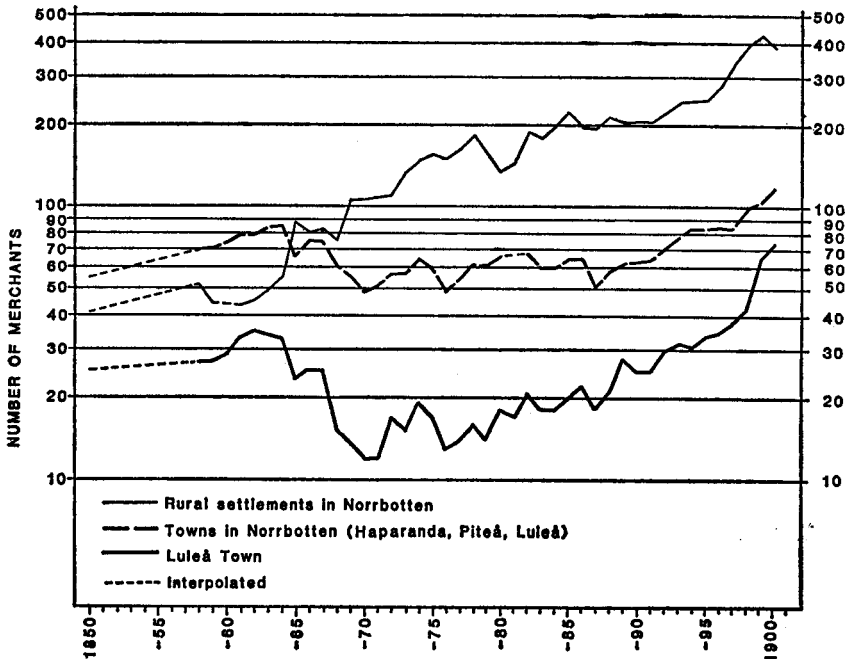


Fig. 7—Changes in the numbers of merchants in the town of Luleå, together with the towns and rural districts of the county of Norrbotten 1860-1900.

Sources: Sweden's official statistics: *BISOS ser E 1850-94*, *BISOS ser F 1895-1900*

TABLE 1

New general stores and craftsmen (...) registered 1864-1870 in the parishes formerly belonging to Luleå town's «*handels-gebiet*»

Parish									Σ merchants	
	1864	1865	1866	1867	1868	1869	1870	Total	1880	
Luleåtown	—	(1)	—	—	—	—	1	1(1)	29	
Nederluleå	16(5)	10(2)	1	1	—	3	3	34(7)	2	
Överluleå	7(1)	8	1	2	—	2	2	22(1)	11	
Råneå	4	—	—	3	—	—	—	7	—	
Jokkmokk	9	2	2	1	—	2	—	16	—	
Gällivare	4	4	—	1	—	1	—	10	—	
Luleå region	40(6)	24(3)	4	8	—	8	6	90(9)	42	
Others in BD	19(3)	15	4	3	8	7	7	63(3)	59	
Total in BD	59(9)	39(3)	8	11	8	15	13	153(12)	101	

Source: Register of new businesses (*Alfabetiskt register till föreningsregistret 1864-1945, ser C II (b) vol. I, Landskansliets arkiv, Norrbotten County Archives, Luleå*) [BD=Norrbotten county].

lowing year also saw a large number of applications, but the rate declined significantly thereafter. This demonstrates that the diffusion of retail services had been effectively restrained by earlier regulations and that their relaxation opened up the floodgates to repressed local needs for easier access to retailers, particularly to general stores. Permanent shops (open throughout the year) were now established in Luleå Gammelstad, Boden, Heden, and most of the larger villages in Neder — and Överluleå, as well as in the old market centres (Råneå, Jokkmokk and Gällivare) which had previously been restricted to their statutory market days. This increase in country shops reduced the importance of the traditional markets and the markets at Råneå, Överkalix and Nederluleå (Gammelstad) ceased to operate around 1860 (HOPPE 1945:245). Certain summer markets at Råneå and Edefors dealing in tar and hand — and watersawn timber were retained, but were soon to decline as the demand for tar fell and the steamsaws took over the production and direct export of timber. The two Lapp markets of Jokkmokk and Gällivare,

however, continued in importance until the end of the century (ibid).

Frequently the new businesses that started up in 1864-5 were local retail branches established by the town merchants, e. g. Olaus Nilsson and J. M. Finell in Luleå Gammelstad, Nils Sundström in Boden, Gammelstad, Heden and Råneå, Jonas Bodell in Boden, J. F. Olsson Lindgren in Brändön, H. A. Benckert and C. A. Govenius in Jokkmokk (the latter also in Gällivare), N. E. Bergström in Gammelstad and Jokkmokk, Lindgren in Jokkmokk and Råneå, O. D. Sundberg in Edefors (Harads). Others were initiated by industries that already had trading privileges; for example, in 1869 the Bodträskfors sawmill owners (i. e. Bergman, Hummel & Co., then owned by C. O. Bergman and N. E. Bergström, both from Luleå) opened a general store in Jokkmokk, which served both as a retail outlet and as a distribution centre for supplies to company employees engaged in lumbering and floating. Most of the remaining new businesses, however, seem to have been started up by local enterprise in the larger villages, such as the two parish centres of Luleå Gammelstaden (17/21) and Boden (11/13), and the farming villages of Harads (3/4), Heden (3/4), Smedsby (4), Persö (4), Ersnäs (2), Sundom (2), and Antnäs (2), especially during 1864 and '65. Initially they usually had the character of general stores, offering groceries and a small selection of the range of manufactured wares traditionally imported from Stockholm by the town merchants. The decline in the numbers of town merchants in Luleå between 1864-70 (from 35 to 12) can thus be largely attributed to the relocation of some of their business activities.

Local everyday needs were increasingly catered for by these new village stores, so that the town merchants (who had hitherto tended to deal in remarkably similar assortments of imported foodstuffs, tobacco, textiles, metalware, etc.) must have found themselves forced into more direct competition with one another on the retail side. As the traditional trade in butter, tar, hewn and handsawn timber declined, so the merchants began to lose their special relationships (i. e. credit ties) with individual farmers and, at the same time, the local competition resulted in them losing customers (according to the 5-year report from the Governor of Norrbotten

in 1822, p. 23). This inevitably led many of Luleå's merchants to abandon the food sector and, instead, specialize in other lines of consumer goods, for which people would be prepared to make the long journey to town. Specialization was further encouraged by the rapidly growing population and by the increasing cash flow resulting from the numerous employment opportunities offered by the new industries.

Thus the legislation of 1864 effectively ended the trade and craftsmen's guild monopolies of the coastal towns, systems that had operated for more than two centuries and which had only been partially eroded by the trading privileges granted to certain industries as an inducement to local investment. With the rise of the iron and timber industries and the decline of trade in the traditional products of farming, fishing and tar-burning, the role of the town merchants as wholesale exporters declined substantially. Consequently they concentrated more on the retail trade and often specialized in particular types of goods rather than continuing to offer a wide range in direct competition with each other. A number of town merchants, however, continued to retain wholesale interests with regard to the import of certain foodstuffs and wares, supplying other retailers — especially in the smaller settlements inland.

During most of this period some of the wealthier town merchants continued to operate vertically-integrated businesses, handling the purchase and sale of a wide range of imports and exports as well as owning both small vessels for the local collection of products and large ones for shipping cargoes to and from Stockholm and abroad. Ship construction, sawmilling, banking, farming, and fishing, were also among the many activities pursued by merchants in Luleå (LAYTON, 1982). The scale of these operations gradually declined during the course of the century, in the face of competition from foreign shipping, the introduction of organized banking and regular coastal steamship services, etc., so that merchant bankruptcies were not infrequent in Luleå.

The Luleå tradesmen's association (*Luleå Köpmannaforening*) was formed in 1840 as a direct continuation of the old Luleå merchants' association (*Luleå Handlareforening*), according to protocol from 1843 (NILSSON, 1950, p. 5). Similarly,

the craftsmen also had their own local factory and craft association or guild. Originally, membership had been obligatory in order to practise trade or a craft and, even after the regulations were removed, membership continued to be the main seal of approval for experienced and well — qualified merchants and master craftsmen. Not everyone applied for, or was granted, membership and after 1846, when large numbers of «unqualified» small-scale businesses sprang into being, only the larger established firms belonged to these now voluntary organizations. However, official statistics (e. g. magistrates' reports, governors' reports and BISOS publications) continued to use membership lists as the basis for their annual reports, so that for some years after the 1860s the total numbers of businesses are far from accurate (Fig. 7 & Table 1). Nevertheless, these figures do tend to reflect actual trends and thus provide a rough framework for analysis. The sudden upswing in the numbers of merchants in the town of Luleå during the 1890s (Fig. 7) was clearly a result of the population boom in association with the opening of the iron ore railway and the ore processing and export at Svartön. Many of the new retail businesses and other services were highly specialized, serving not only the large urban population but also a large part of Luleå's former sphere of influence. The town had thus lost its importance as the sole source of everyday food and consumer goods, but consolidated its dominance as the regional centre for administration and higher order goods and services.

THE DIFFUSION OF HANDICRAFTS

As mentioned above, the relaxation and removal of the restraints on local economic activity in 1846 and 1864 also created opportunities for private enterprise within the craft sector. Before the lifting of the guild restraint (*skråtvänget*) in 1846, rural parishes had been allowed to appoint certain craftsmen to serve the district (NORDBERG, 1965, p. 289). Hence in 1830 there were 16 approved individuals in the rural parish of Luleå (4 tailors, 3 shoemakers, 4 blacksmiths, 2 painters and 3 carpenters). In 1845 these had increased

TABLE 2
Numbers of qualified master craftsmen in Luleå town

	1815	1830	1850	1860	1880	1900
Master craftsmen	30	31	54	55	62	71
Population	919	1064	1257	1516	3120	9484

Sources: Annual reports on merchants and craftsmen in towns (*Arsberättelser om handlande och handverkare i städerna, Kommerskollegiets arkiv, Riksarkivet*).

slightly to 22 (5 tailors, 5 shoemakers, 8 blacksmiths, 1 painter and 3 carpenters), but in 1860 the official records of guild-approved craftsmen only listed 13 names in the rural areas (3 shoemakers, 3 tailors, 1 blacksmith, 2 carpenters, 3 tanners and 1 clockmaker), and newcomers must therefore have been denied professional recognition. The last guild restrictions were removed in 1864 and thereafter such enterprises could, in principal, be set up anywhere — even near to and within the town (HEDIN, 1965, p. 130).

Table 2 shows that the numbers of officially recognized craftsmen in the town of Luleå increased during the century, but not in step with the rapid population growth of the latter decades. These official data are misleading, however, for there were increasing numbers of persons setting up business in crafts and services — often without any specialist training or recognized qualifications. The *laissez-faire* policies of the latter half of the nineteenth century thus favoured private enterprise and initiative; for as the town expanded, so did the number of opportunities (and opportunists!).

By the very nature of their particular skills local craftsmen were, of course, already specialized and they gradually came to complement their own output with associated products imported from outside the region — thus offering specialist retailing as well as services. These trends were to become increasingly apparent in the final decades of the century.

THE IMPACT OF INDUSTRY

One of the most significant socio-economic effects of industrialization in the local economy was the introduction of a dualism between the new industrial system and the traditional agrarian forms of production. Whereas the town merchants had previously controlled the region's trade and commercial production (tar, hand-sawn timber, etc.), the new ironworks and sawmill industries were largely in the hands of external capitalists. These industries were engaged in producing solely for the export market and the profits rarely found their way back into the region, so that the industrial utilization of the region's resources rarely had much of a multiplier effect locally.

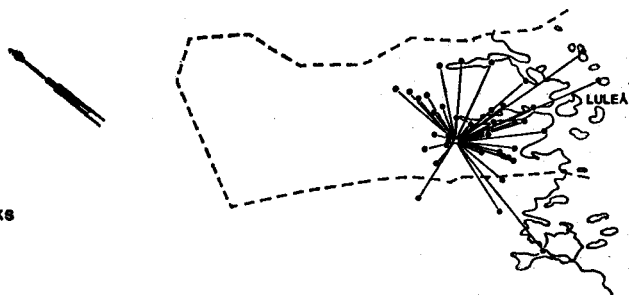
The new water-powered «proto-industries» kept detailed accounts, some of which have survived from the early 1800s, and from these records it is possible to reconstruct their contacts simply by mapping their employees' home villages. In the early stages of forest exploitation the catchment areas tended to be fairly small. The Selet ironworks (Fig. 8a) provides a good example of this and shows that 325 labourers were mostly recruited from settlements within a 25 kilometre radius. They worked at the ironworks in the summer, produced charcoal in the local forests and provided transport services, especially during the winter months when the one and finished bar iron could be more easily carried overland on horse-drawn sledges.

In the Luleå district the earliest commercial sawmill, using fine «Dutch» blades and more efficient waterwheels, had been established in 1785 at Hedensfors, above the falls which formed the first obstacle to fluvio-maritime navigation. The pattern of contacts in 1860 between Hedensfors saw and

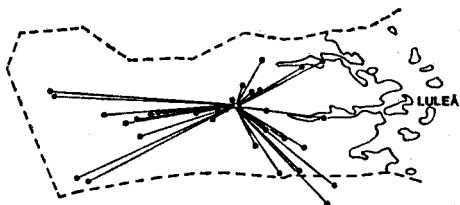
Fig. 8 — Contact patterns between industries and their employees' home villages, hamlets and farms.

Sources: Account ledgers (*avräkningsböcker*) for (a) *Selets bruk 1801/2*, *Enskilda arkive C 176:28*, *Härnösands landsarkiv*, (b) *Hedensfors såg dagsverks bok och varujournal 1860*, (c) *Bodträskfors sågs avräkningsbok 1864*, (d) *AB Bodträskfors, Bodträskfors förvaltning, avräkningsbok 1900*, and *Altappen sågs avlöningsbok 1899*, from the Swedish Cellulose Company archives (*SCA:s Merlo arkiv*).

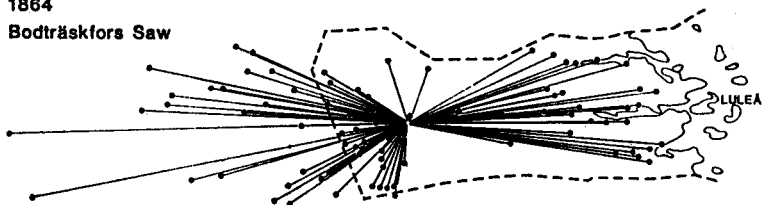
A
1802
Selet Ironworks



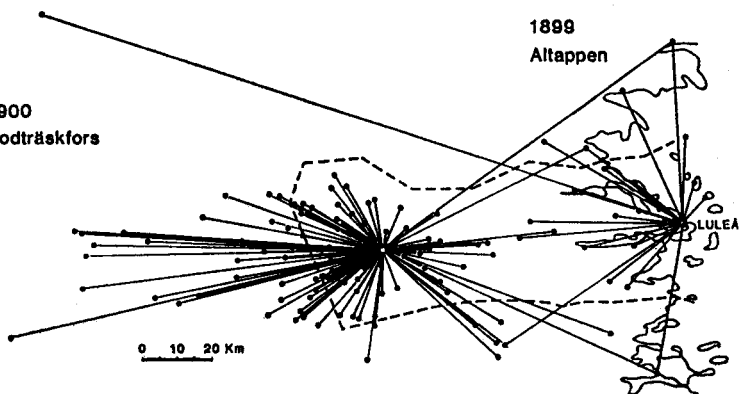
B
1860
Hedensfors Saw



C
1864
Bodträskfors Saw



D
1900
Bodträskfors



its labour force of 115 individuals can be seen in Figure 8b. The upstream contacts were related to the main areas of forest utilized by the sawmill at this time, consisting of the forests formerly set aside for the Övre Svartlå ironworks and of forest land taken up by the company through new settlements. Other watersaws appeared as restrictions were lifted on production in 1842 and on the free establishment of export saws after 1863 (WIK 1950:41). By this time, the forests below Lappmark had become legally available for settlement and utilization through the process of «*avvittring*», whereby the state delimited its forests from those owned by private individuals or communities. Bodträskfors sawmill was established in the 1840s and by 1864 (Fig. 8c) the company had already gained access to extensive forest tracts through organizing settlement in the Edefors area and in adjacent Lappmark, employing 430 individuals for varying periods during the year. In the already cut-over coastal districts, many farmers took their horses into Lappmark in winter to drive timber to the frozen floatways, hence the company's wide contact net below the sawmill.

To replace their original felling rights, the earlier privileged sawmills were allocated extremely generous grants of forest property and, until 1906, companies were also able to purchase forest land from homesteads and farmers in order to secure regular supplies of cheap timber. The *avvittring* process in Lappmark began in 1873 and the larger watersaws and coastal steamsaws extended their timber catchment areas by purchasing forest and cutting rights farther inland. Numerous new homesteads were established in Lappmark, with generous grants of forest land, so that labour was now available in these areas for felling and floating work (see Bodträskfors 1900, Fig. 8d). As these settlers usually had horses of their own for farm and forest work, the total number of horses in Lappmark increased rapidly during the final decades of the nineteenth century (LUNDGREN, 1984, pp. 52 ff.). This may well account for much of the decline in Bodträskfors' recruitment of coastal farmers and their horses between 1864 and 1900 (compare Figs. 8c and 8d).

The labour force administered by Bodträskfors in 1900 thus remained at the same level as in 1864 but, out of the 428 workers, more were engaged in felling, fewer in floating and only a handful of individuals continued sawing activities at the old watersaw. More workers lived in the inland areas and fewer were recruited from the coastal districts.

The coastal steamsaws now provided year-round employment for nearly 1,000 workers and their families, living in barrack-like accommodation adjacent to the mills. In addition, about three to four times as many seasonal workers worked at the sawmill sites for periods of as much as 7-10 months of the year—especially when the saws operated double shifts and extra labour was needed in the timberyards. At Altappen steamsaw, for example, at least 428 individuals were employed in this way during 1899 when 126 of them lived permanently on this island site and the remaining 302 were seasonal workers. Of this latter group, only 82 were recruited from the coastal villages (see Fig. 8d), the rest coming mainly from other districts in Norrbotten and Västerbotten and from Finland. It should be noted, however, that these figures excluded large numbers of day-workers who were engaged in loading vessels during the shipping season.

Company account books for the second half of the nineteenth century thus reveal that sawmill contact field expanded inland, and new settlers in the interior were employed as well as migrant seasonal labourers from farming villages. Until the latter decades of the century, labour was largely paid in kind, especially with grain, flour, peas, tobacco, etc. This meant that these proto-industries accounted for the basic import needs of a substantial part of the local population, thus eroding the former hegemony of the town merchants. Furthermore, the rise of the cash economy, better wages in industry than within the traditional agrarian sector, and the decline of the tar trade, left farmers and their farmhands less dependent on the merchants for credit, supplies, and subsidiary incomes.

URBANIZATION

The true industrialization of resource utilization and processing got under way during the last three decades of the century, when steam-power was applied to new coastal sawmills, rolling mills, shipping and rail transport. The population boomed, apparently in response to the enormous increase in employment opportunities, in terms of both year-round work in the mills and mines and seasonal work in the forests and floatways. The concentration of industries to the mouth of the Lule river and the construction of the railway linking the iron mines of Gällivare with the port of Luleå were important factors behind the rapid expansion in the urban population. This tended to compensate the established merchants for their loss of rural customers (in terms of basic supplies rather than specialized wares) and, at the same time, this also attracted further specialist businesses and services to the town, thus consolidating its primacy within the region.

It appears likely that the closure of the inland saws and ironworks and the rise of the steam-powered mills drew many workers towards the coast (e. g. to Karlsvik, Stensborg and Altappen, Figs. 4 & 8d). Furthermore, the construction of the railway to the iron mines of Gällivare attracted considerable labour to the town Luleå, which was the port of shipment and the site of a new ore enrichment plant at Svartön (creating suburbs such as Svartösten, Figs. 4 & 5). However, the enormous timber requirements of the new saws meant that there were also more job opportunities inland (especially in Lappmark), and in many cases this work continued to be organized from the offices of old sawmills (e. g. Bodträskfors). During this industrial phase wages were increasingly paid in cash form, so that sawmill companies such as Altappen came to rely upon local merchants to provide food supplies and general stores for the work-force, both in the forests and at the sawmills. Thus, not only the farming population but even the town merchants were able to find niches in the industrial system, and the degree of dualism was reduced as industrialization pervaded the region's local economy during the latter decades of the century.

The free trade policies that prevailed internationally in the second half of the nineteenth century (and led to the enormous expansion in Luleå's resource exploitation, industrial output, and population) were also reflected in the valley's internal economy. Mercantile restrictions were replaced by «liberal» freedoms of production and location, permitting industry, settlement, and commercial activity to reorganize and relocate locally in the most economic fashion — i. e. in ways best-suited to the contemporary production and transport technology and economics. As the wave of forest utilization moved inland, accompanied by the diffusion of settlement, so the population also expanded in the coastal region. This meant that the network of communications was both extended and intensified. The changes observed here in the Luleå district's internal contact patterns during the nineteenth century thus reflect the increasing movement of people, goods and ideas — all of which help to explain changes in man's impact on the landscape as a whole.

CONCLUSION

It is important, therefore, to understand the working of a region's infrastructure when attempting to explain how and why the landscape changes *in totam*. Mapping the socio-economic contacts between merchants and the rural population, and between industries and their labour force, can provide further insight into changes in the spatial patterns and rhythms of people's movements and contacts during the nineteenth century. These contacts are intrinsic parts of their ways of life, which collectively influence the landscape in terms of settlement functions and lines of communications, and which evolve largely in response to the availability of employment. Much still remains to be done in this field.

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RESUMO

A indústria e a economia local — mudanças na rede de relações no distrito de Lulea durante o século XIX. No norte da Suécia, a indústria

marcou, significativamente, a paisagem e a economia, durante o século XIX. Alterou não só as comunidades agrárias do litoral e dos baixos vales dos maiores rios, como os territórios florestados do interior, que começaram a ser bastante afectados pela procura de matérias-primas.

Este artigo mostra alguns dos efeitos da alteração tecnológica e socio-económica nas relações entre locais de residência, locais de trabalho e comércio local, no baixo vale do rio Lulea.

As inovações técnicas, no âmbito da indústria e dos transportes, levaram a um grande aumento da utilização dos recursos naturais e à criação de muitos postos de trabalho para a população local e também para trabalhadores migrantes. A sul da fronteira de Lappmark a população teve um aumento superior a 100 % entre 1815 e 1870 e duplicou novamente em 1900. Este dinamismo demográfico impulsionou, consideravelmente, o comércio a retalho e os serviços.

O baixo vale do Lulea conheceu, durante o século XIX, uma sucessão de indústrias com localizações diferenciadas que correspondeu, basicamente, a três ciclos tecnológicos no sector de transformação da madeira, cujo auge foi atingido em 1897. As mudanças na localização industrial deveram-se não só a alterações tecnológicas, mas também a novas possibilidades de transporte, a novos fornecimentos de matérias-primas e às disponibilidades de mão-de-obra.

O crescimento e a melhoria da rede de estradas, durante o século XIX, tornou mais fácil o transporte de grandes volumes de mercadorias para o interior, a partir do porto de Lulea, o que levou à desconcentração do comércio a retalho, até aí localizado exclusivamente na cidade. A legislação de 1864, que diminuiu as restrições ao estabelecimento de novas unidades comerciais, contribuiu também para acelerar o processo de descentralização.

A medida que a organização económica tradicional, foi desaparecendo, o desenvolvimento de um sistema hierárquico de lugares centrais foi-se afirmando e a hegemonia da cidade de Lulea foi-se esbatendo.

RÉSUMÉ

L'industrie et l'économie locale. Les modifications du réseau de relations dans le district de Lulea, au cours du XIX^e siècle. Dans le Nord de la Suède, l'industrialisation a fortement marqué de son empreinte les paysages et l'économie. Elle a modifié non seulement les communautés agraires installées sur le littoral et dans les basses vallées des principales rivières, mais aussi les territoires largement boisés de l'intérieur, qui commencèrent alors à être sensiblement affectés par la recherche des matières premières.

On montre dans cet article quelques-uns des effets que les mutations technologiques et socio-économiques eurent sur les réseaux de relations liant les lieux de résidence, les lieux de travail et ceux d'implantation du commerce local, dans la basse vallée de la rivière Lulea.

Les innovations techniques réalisées dans le domaine de l'industrie et des transports provoquèrent un fort accroissement de l'utilisation des matières premières, d'où la création de nombreux postes de travail dont profitèrent non seulement les habitants dépourvu de terres, mais aussi des migrants saisonniers et permanents. Au long de la frontière du Lappmark, la population fit plus que doubler de 1815 à 1870, puis doubla à nouveau jusqu'en 1900, atteignant alors 34 620 habitants. Cet important accroissement, sensible tant en ville qu'à la campagne, permit naturellement au commerce de détail et aux autres services de se développer.

La basse vallée de la Lulea connut, au cours du XIX^e siècle, une successive implantation d'industries, liées à trois cycles technologiques successifs dans le secteur de la transformation du bois qui atteignit son apogée en 1897. Les changements de localisation de cette industrie sont dus non seulement aux progrès techniques réalisés par les scieries, mais aussi aux possibilités nouvelles de transport, aux nouveaux lieux d'extraction des matières premières et aux nouvelles ressources en main d'œuvre.

Le développement et l'amélioration progressive du réseau routier permirent aussi le transport vers l'intérieur de quantités croissantes de marchandises depuis le port de Lulea, ce qui provoqua la diffusion du commerce de détail, jusque-là exclusivement concentré en ville. La législation de 1864, qui levait certaines restrictions à la création de nouvelles unités commerciales, contribua aussi à accélérer ce processus de diffusion.

Au fur et à mesure que disparaissait l'organisation économique traditionnelle, un système hiérarchisé de lieux centraux se développait peu à peu, en atténuant par conséquent l'ancienne hégémonie régionale de la ville de Lulea.