

# A new education for a new Sweden - The technical secondary school 1855–1920<sup>1</sup>

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## Abstract:

*Already during the first half of the nineteenth century, the question of getting more people to engage in business occupations instead of “consuming” occupations in the service of the state had been discussed in both the parliament (the Swedish Riksdag) and among people engaged in education. Better educational opportunities and, by extension, a higher degree of social mobility was considered to favour a faster industrialisation process and thus also Swedish competitiveness in the international markets. By the middle of the nineteenth century, the lack of technically knowledgeable staff stood out as urgent. In the locally and regionally based industries, most foremen and people in senior positions had no other education than the one they could get through practical work directly in the workplace. In order to remedy the shortage of technically trained staff and to support regional industrial and economic development, the parliament, therefore, decided in the early 1850s to establish a number of technical secondary schools. This article is about the location of the schools, what they offered in terms of teaching and to what extent they can be said to have fulfilled the ambition to strengthen regional development.*

## Introduction

European development during the 1850s marked the beginning of a fundamentally new process of industrialisation. In many countries, railway construction gained momentum, new processes in steel production spread, and far-reaching institutional changes were implemented. Technological, economic, and political developments meant both the liberalisation of national markets and greater cross-border mobility. Sweden benefited from an almost explosive demand for export goods, mainly raw materials and simple industrial products, as other countries increased their investments in railways, industries, and housing. For Sweden, therefore, the 1850s are usually regarded as the beginning of a period of profound new economic and social development. Over a few decades, industrialisation and urbanisation took off in earnest, and at the turn of the century 1900, Sweden had become an established and successful industrial country (Schön 2014).

How was such a transformation possible? There are, of course, several answers to this question. Technological and organisational advances as well as institutional changes, which facilitated enterprising spirit and entrepreneurship, are usually highlighted as important explanatory factors. Another important factor is considered to have been the availability of well-distributed and developed human capital. Sweden differed early from many countries in that the majority of the population was at least partially literate at an early age, which was an effect of the Church Act of

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1686, which stipulated that all adult Swedes should be able to read the essential religious scriptures themselves. Of course, the introduction of the public primary school in 1842 also came to play an important role, but the effect was not immediate and did not remedy the shortage of technically skilled staff in the emerging industries. In this situation, thoughts were expressed about a new technical education - the technical secondary school - which came to be a significant complement to the technical education that already existed in the country.

### Emerging thoughts about a new technical education

As regards higher technical education, Sweden had by the middle of the nineteenth century begun to approach the same level as Europe's leading industrial countries. Teaching at the Technological Institute in Stockholm (since 1877 Royal Institute of Technology), founded in 1827, gradually had become more advanced (Torstendahl 1975). However, the training was focused on providing large-scale industry and the public administration with engineers and was not adapted to the emerging new small and medium-sized companies (Ahlström 1993). Even at a lower level, there was already some access to technical education in the so-called technical Sunday and evening schools. As the name suggests, these schools addressed already-employed people who could study in their spare time only. However, most of the courses at these schools were general; the purely technical elements seem to have been few (Nilsson, 2008).

At the same time, the technological optimism that began to spread in Europe also reached Sweden and the Swedish government, which in 1850 gave the principal of the Technological Institute, Lars Johan Wallmark, the task of coming up with a proposal for improvements at Stockholm's handicraft school (the concept of handicraft was broad at this time and also included what we would today call technical subjects). Wallmark (1851) took the opportunity, however, and instead presented a complete national plan for technical teaching at three levels where a new educational institution, called the technical secondary school, would fill the gap between the technical Sunday and evening schools and the Technological Institute. The proposal aroused approval in the parliament, and during the 1850s, four technical secondary schools were established. First out was Malmö in 1853 and a few years later followed Borås (1856) and Örebro and Norrköping (1857). Northern Sweden had to wait all the longer for its technical secondary school. It was not until 1901 that one was established in Härnösand (Lundh Nilsson & Grönberg, 2019). This article focuses on the schools in Malmö and Borås.

### What determined the location of the technical secondary schools?

A basic idea behind the establishment of technical secondary schools in different parts of the country was that they would stimulate industrial development in the regions where they were established. The way of thinking was the same as the basis for the proposal for a Swedish railway system, which was presented in the mid-1850s, and which was also about favouring development in parts of the country that had lagged behind in the absence of communications (Berger & Enflo, 2017).

Since Wallmark's original assignment was to investigate the possibilities for improving education at Stockholm's Handicraft School, it was natural that he proposed Stockholm as one of the first two cities that should have a technical secondary school. The other city was Malmö. In Stockholm, the city board considered that it was enough to have costs for the Handicraft School, and in the parliament, it was considered that the state had already raised enough money for this. Stockholm, therefore, fell away early as a place of establishment. However, Wallmark's other proposal, Malmö, came to fruition. The city of Malmö had already in 1850 applied for a state grant to start a school

that would prepare for higher technical studies. Malmö was also willing to pay for teaching facilities. Despite good conditions to be able to get started quickly with the new education and despite the fact that there was a majority in the parliament to establish a school in the southernmost part of the country, it was not without counter-arguments that the parliament could finally decide on the establishment in Malmö of the country's first technical secondary school.

According to Wallmark's original plan, additional schools would be established in Gävle, Härnösand, Kalmar, Karlstad and Norrköping. As we have already seen, however, the reality came to look different. One reason for this was that the financing of the schools entailed a relatively far-reaching financial commitment from each city in the form of the provision of suitable teaching premises. Another reason why most of the localities proposed by Wallmark did not get a technical secondary school was that a regional perspective became increasingly prevalent in the parliament's negotiations in several areas. There was simply a competition as to where the state should invest in various development projects. The other cities that eventually got technical secondary schools also had to fight for their cause. Committed local citizens and their representatives in the parliament played an important role in this. University cities such as Lund and Uppsala also showed interest in the new school and were happy to emphasise their access to competent teaching staff, but industrial activities and opportunities for study visits and internships came to weigh more heavily (Lundh Nilsson & Grönberg 2019).

### The technical secondary school

The activities at the technical secondary schools were regulated by the state, while the Swedish Board of Trade was responsible for ensuring that the regulations were complied with. From the very beginning, the education was of three years' duration in Malmö, Borås and Norrköping, while the Örebro school's education in the first years was only two-year. The content of the teaching could partly differ between the schools, depending on regional industrial differences, for example, the education in Borås was adapted to the region's strong tradition of the textile industry. Despite the name of the schools, they did not only teach technical and scientific subjects such as mathematics, physics, chemistry, mechanics, and linear and construction drawing. History, geography, the Swedish language, and modern languages such as English, German and French also appeared in the timetables during the first fifteen to twenty years (SOU 1876: 7).

To be accepted as a student, the applicant must meet certain requirements in terms of age and prior knowledge. He - this was a school for young men only - would have turned 14 years old, have good handwriting, know the most central religious principles, master the basics of Swedish and German grammar as well as history and geography. He should also master the four rules of arithmetic with common fractions and decimal fractions and know the basics of geometry. When applying, grades had to be presented, either from an educational institution or a private teacher. In some cases, the school could also require the applicant to take an entrance examination (SOU 1876: 7).

The rapid industrial development and the increased need for technically trained staff in the early 1870s led the government to appoint a committee to investigate the lower technical education, including the technical secondary schools. When the committee presented its results in 1874, it highlighted four areas that would improve education at these schools. Firstly, it was considered that the schools should concentrate entirely on training technical leaders at lower levels, such as foremen, leaders for small industries and leaders for construction work. The supporting role that the schools had (except for the school in Norrköping) to prepare for studies at the Technological Institute was no longer considered relevant. Secondly, the prerequisites needed to be tightened.

Thirdly, industrial development entailed higher demands on specialisation and, therefore, the committee proposed a division of education into three programmes - one mechanical, one chemical and one construction programme. Fourthly, the timetables were considered too broad; all non-technical and scientific subjects except the Swedish language had to be ironed out. Foreign languages were still allowed but became voluntary (SOU 1876: 7).

Slightly more than 30 years later, Sweden was an established industrial country (Schön 2014). The parliament appointed a new committee in 1907, with the task of once again adapting and improving the lower technical education. The committee presented its proposal five years later (SOU 1918:10).<sup>2</sup> The curricula were again criticised for focusing too little on purely technical subjects and the most important subjects for the various programmes. As far as the latter was concerned, the committee meant that the division into programmes came too late. The length of the education was also criticised; two years should be enough to train a specialised and practically knowledgeable technician. This time, therefore, the committee was not content coming up with suggestions for improvements. Instead, they proposed a new type of vocational school (*fackskola*). The education would be of two years duration and specialised from the beginning - not only in the three areas mentioned above but also in electronics, road and canal construction, forestry, textile industry, and paper and pulp industry. It was also expected that the vocational schools would provide sufficient knowledge for those who wanted to engage in business activities in various branches (Proposition no. 335, 1918). Despite some criticism, the proposal was approved by the parliament, but only one year after the end of the First World War. The era of the technical secondary schools was thus over, even though the schools themselves survived, now as two-year vocational schools.

### Where did the students come from, and where did they go after graduation?

To answer the question of whether the technical secondary schools fulfilled the purpose of functioning as regional education centres and providing each region's business community with technicians, we have examined where the students came from and where they went after graduation. In the latter case, it is partly about where they were two, five and ten years after graduation, and partly about the industry in which they were employed. The division into regions that we have used is based on the fact that the schools in Malmö and Borås, respectively, were geographically closer to an applicant than any other technical secondary school. By Malmö region we mean for Malmö's part Skåne, Blekinge, southern Halland and southwestern Småland. The Borås school region includes Västergötland, Dalsland, Bohuslän and parts of Småland and Halland (Lundh Nilsson & Grönberg, 2019).

### Students' geographical origin

The new technical schools would not only benefit the economic and industrial development of the respective cities and regions. They would also bridge the great geographical distances of the time within the country and make it possible for more talented young people to choose a technical education. Few were privileged to travel to and settle in Stockholm to study at the Technological Institute. We have therefore investigated the extent to which the schools in Malmö and Borås succeeded in attracting young people from each region and whether the recruitment pattern changed over time. We have found the information about the students in memory books and catalogues of students at each school (Köhler 1912; Montéen 1928; Teknologernas förening i Borås, 1874, 1885–1900, 1903–1904, 1913–1930, 1950).

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<sup>2</sup> In this case, there is a discrepancy as regard the dating of the Swedish official reports (SOU).

From the beginning, it turned out that the differences were considerable between the two schools, which was not unexpected given the differences in the size of the cities and the economic structure of the surrounding areas. The school in Malmö attracted almost three times as large a proportion of students from the city itself compared with the school in Borås during the period 1855–1890 and twice as large a proportion of students during the years 1891–1920. Many of the students in Malmö came from other parts of Skåne, while significantly fewer of the Borås students had their origins in other parts of Västergötland. A reasonable explanation is, of course, that Malmö was a much larger city than Borås and that the opportunities for studies in other places differed. In the latter case, Borås, for example, competed with the technical secondary school in Norrköping. On the other hand, we can state that the school in Borås attracted significantly more students from other parts of Sweden than the school in Malmö. Overall, the differences between our two survey periods persisted. We conclude, therefore, that many of the students in both schools did come from each region, but that the school in Malmö seems to have fulfilled the purpose of being a school for the region's young men to a greater degree than the school in Borås (Lundh Nilsson and Grönberg, 2021).

### After graduation<sup>3</sup>

Where did the students go after they finished their studies? The proportion of graduates that remained in each region decreased the longer the time after graduation, but a larger proportion remained in the Malmö region than in the Borås region. Almost 50 per cent of those who graduated from the technical secondary school in Malmö were active in the Malmö region ten years after graduation, whereas 35 per cent of those who graduated in Borås were found in the Borås region. For the latter, this meant that a considerable proportion was instead active in other places in Sweden.

The schools in Malmö and Borås seem to have in common that between 15 and 20 per cent of their graduates went abroad, either for internships and/or studies or for regular employment. The geographical location of the two schools and the industrial peculiarities of their surroundings influenced where they went. With a degree from Malmö, it was close at hand to choose Germany, which had come further in its industrialisation process than Sweden. In Germany, there were opportunities to practice or get a job in the mechanical or chemical industry as well as in the food or construction industry. There were also prominent technical universities in Germany, for example, in Berlin-Charlottenburg, Hanover and Dresden. During the second half of the nineteenth century, it was also easier to travel from Malmö to northern Germany than to Stockholm. For those with a degree from the school in Borås, the Borås region's dominance of the textile industry was reflected in the choice of Great Britain, which had a strong position in the textile industry, for further studies and employment. The great emigration to North America during almost the entire existence of the technical secondary school, meant, of course, that some graduates went across the Atlantic to complete their studies. This applied especially to the students of the Borås School. Other graduates went there as emigrants or to gain practical experience to bring back to Sweden after a few years in the big country in the west.

Looking at the time from graduation to the establishment after ten years at the labour market, we can state that far from everyone who graduated in Malmö and to an even lesser degree in Borås stayed in or returned to the school region. Improved communications meant increasing mobility. At first glance, one could therefore fear that the school regions were exposed to a kind of brain drain.

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<sup>3</sup> This part of the article is based on Lundh Nilsson & Grönberg (2021)

However, we have been able to state that overall, there was an extensive exchange between the school regions of people with degrees from all four, later five, technical secondary schools, which also meant an influx of knowledge from other school regions. Some also returned to the school region after some years in other places in Sweden. Even among those who spent a few years in, for example, Germany, Great Britain or the United States, there were returnees who brought with them experience and new knowledge.

After graduation, the newly graduated engineers not only spread out geographically. A clear majority established themselves in industry and crafts, which had also been the intention of the technical secondary schools. Social, economic, and industrial development also played a vital role in the career opportunities that existed. The expansion of railway networks, tram traffic and canals required their own technologies, as did the expanding paper and pulp industry. The rapidly increasing urbanisation at the end of the nineteenth century led to increased building and to the expansion of urban infrastructure in the form of gasworks and water and sewage systems. The breakthrough of electricity, around the turn of the century, was reflected both in the teaching at the technical secondary schools and in many employments related to the expansion of electricity. As more and more people left relative self-sufficiency in rural areas for work in the cities, there was also a domestic market with the demand for "everyday goods" such as food, textiles, and shoes, which now were manufactured on an industrial scale.

The increased demand for technically knowledgeable staff seems to have gradually left its mark on the motivation to apply for further education after completed studies at the technical secondary schools. During 1855–1890, about 30 per cent of all graduates in Malmö and Borås studied two years after graduation. During our second survey period, the proportion of students had fallen to less than ten per cent in Malmö and 13 per cent in Borås. It was probably also the increased demand for technicians that ended the three-year fairly general technical education at the country's technical secondary schools. The before mentioned two-year vocational schools were considered to be better suited to quickly train specialised technicians for new expanding industries. For the individual, a good labour market and a less costly education were attractive.

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