# The Listed Industrial Heritage in Denmark 1918-2023

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Denmark is by many seen as a country dominated by agriculture. Nevertheless, industrial heritage has always been part of Danish listing practice. The number of listed industrial plants rose from 2 in 1918, when the first listing act was adopted, to 8 in 1970 to 53 in 2021 or from 10 to 118 to 374 if we count the listed industrial heritage in a broader sense. The initial count only includes factories whereas the second set includes bridges, railway stations, lighthouses, power plants and workers dwellings etc. However, it is only a paradox if we assume that Denmark was an agricultural country, and that listing does record and reflect important developments of the society and that industry was without any significance, and therefore should not have been listed. Part of the answer is that Denmark in fact underwent several waves of industrialization from 1840 if not before, and today is marked by industry.

**NLMK Dansteel in Frederiksværk. The buildings are not listed, but the whole town was declared a industrial site of national value. The steelwork started production in 1943 and was taken over by Russian interests in 2002. Photo CAJ 2007.**

While there are several overviews of the preservation of industrial heritage in Denmark it is fair to say, that they have been written as part of an argument for research in and preservation of this heritage.[1] Listing and preservation of industrial heritage has not been analysed in a broader perspective or seen as a part of the development of Danish society. This lack of analysis of industrial heritage also characterises the two books published as part of centenary jubilee of the listing act in 2018.[2] The one was celebrating the history of listing in Denmark seen from an official point of view, the other was more critical especially concerning the development during the last twenty years and the review of the listed buildings carried out in the period from 2010 (*fredningsgennemgangen).* Without going into a full-scale analysis, the economic historian, Ole Hyldtoft, has pointed to a number of courses. He suggests economic growth, physical restructuring and the declining role of agricultural export value since the middle of the 1950's, as well as the expansion of higher education and rising funds for research and museums in addition to inspiration from Marxism from the 1960's as a part of the explanation for the rising interest in industrial heritage in 1970's.[3]

## METHODS AND MATERIAL

How do we analyse this increased focus on industrial heritage? Here I will see the rise from three different points of view.[4] The changes can be seen as a reaction to external and often recurrent transformations, such as the change from one technical paradigm to another, which at the micro level will be manifested in events such as the closing of companies, the demolition of buildings and destruction of landscapes as well as the introduction of new building technics, new materials and new layouts.[5] At the same time, the changes can also be seen as structural changes in mentalities of different actors. Here the changes appear to be internal among the actors as the result of new ways of seeing and of new interests. To use the art historian Gombrich's old concept *schemata,* the new interest in industrial heritage can be analysed as the discovery and correction of a new set of schemata.[6] Examples are the introduction and development of industrial archaeology, new ideals among architects and planners such as the classicising interest in silos and the local building tradition *(Bedre Byggeskik),* functionalism and the interest in machines, the interest in "architecture without architects" and the interest in reuse/sustainability. The mental changes may also concern other groups than historians or architects such as workers, employers and owners or trade unions and other organizations like political parties or municipalities and be part of their use of history, memorialization, and identity building.[7] Thirdly, the institutional frame should be included in the analysis. In a Danish context, for example one could hardly imagine the regulation of private property such as the listing of buildings in the liberal era following 1848. That first became a possibility after 1900, when the planning and regulation of larger systems and units had proven its worth. The tree approaches clearly supplement each other and do not presuppose a process of identity building or memorialization among the actors nor a change to a post-industrial condition but does not rule out such explanations either.[8]

The aim of the present article is to present and analyse the number of listed industrial buildings in Denmark and thereby to some extent measure the awareness of industrial heritage or at least a part of it. How many buildings were listed, when, and by who? That is, who proposed the listings, who carried them out and how did the owners react? So, the goal is to indicate what has been done by looking at the material structures. Furthermore, the aim is to indicate what has been written about the history of factory buildings, while leaving out the literature on economic and social history, working class culture and business history. The purpose is very briefly to indicate what kind of schemata was available to guide the exploration in the unknown urban landscape, because the layout of factories was and is not common knowledge nor is it part of architectural historiy or historical works. In addition, the growing interest in reuse will be indicated. Finally, the number of industrial museums and their visitors, as far as it is known, will be included. On the other hand, I cannot include an overview of preservation of industrial buildings by planning measures, because no such overview exists on a national level. The same goes for memories and artefacts



**PRESERVATION ACTS IN DENMARK (SIMPLIFIED)**

**1807 Ancient monuments**
The Royal Commission for The Preservation of Ancient Artefacts 1807 and voluntary listing of ancient monuments. From 1937 the new nature preservation act includes mandatory listing of ancient monuments

**1861 Evangelical Lutheran Church in Denmark**
The board of maintenance of public churches 1861

**1918 Buildings including churches owned by other religious communities**
Listed Buildings Act 1918 regulates the entire building inside and outside

**1925 Buildings and areas**
Planning act 1925 it becomes a possibility to regulate the outside of buildings (changed several times)

SIGNIFICANT CHANGES IN THE LISTED BUILDINGS ACT

1918 A and B listings (a permission is required both for exterior and interior changesif the building is an A-listing, whereas on a B-listed buildings notifying the authorities is sufficient). Buildings can be listed if they are of significant architectural or historical value and are over 100 years old with few exceptions

1966 The requirements for A-listing remain unchanged, but B-listing now require permission for exterior works on the facades

1980 A-listings and B-listing are reduced to one listing, which states that works on either the exterior or the interior require permission. Buildings of exceptional value can be listed if they are younger than 100 years old

1997 Buildings older than 50 years can be listed

2010 Landscape architectural works can be listed. A reevaluation project including all listed buildings is commenced

2012 Changes of minor significance on listed buildings are no longer obliged to apply for permission but are only subject to informing the authorities

2018 Specific changes in the interior of approx. 600 listed buildings can be undertaken without prior information or permission

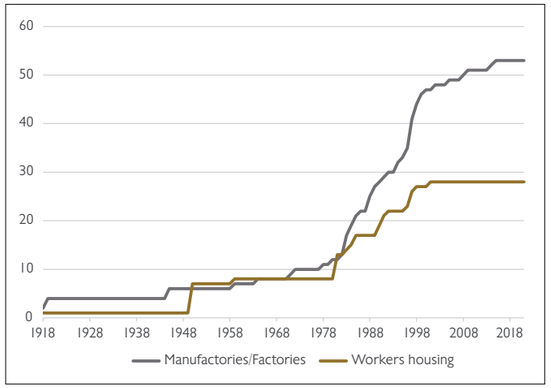



Figure 1. Listed manufactories, factories and Workers housing in Denmark. *Source: FBB, Slots- og Kulturstyrelsen, Center for bevaring.*

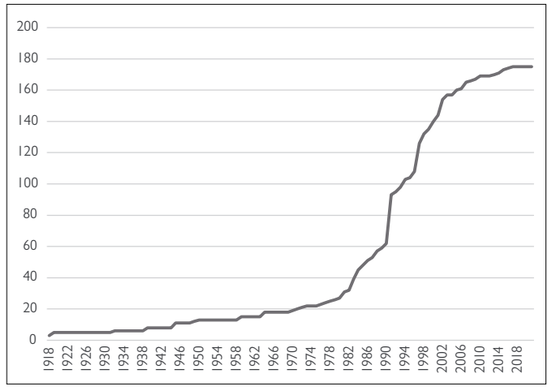



Figure 2. Listed Manufactories, factories, bridges, railway stations and lighthouses in Denmark. *Source: FBB, Slots- og Kulturstyrelsen, Center for bevaring.*

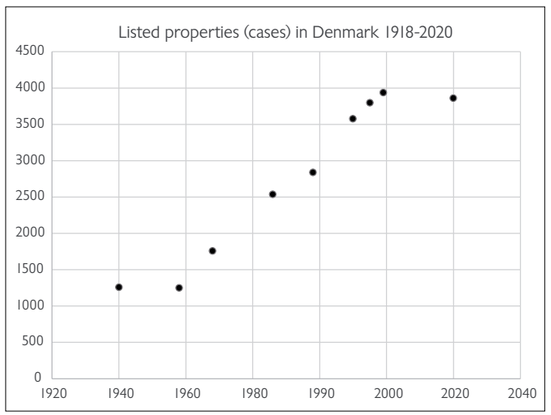



Figure 3. Listed properties (cases) in Denmark 1918-2020. *Source: Fredningslisterne and FBB at Slots- og Kulturstyrelsen, Centret for bevaring.*

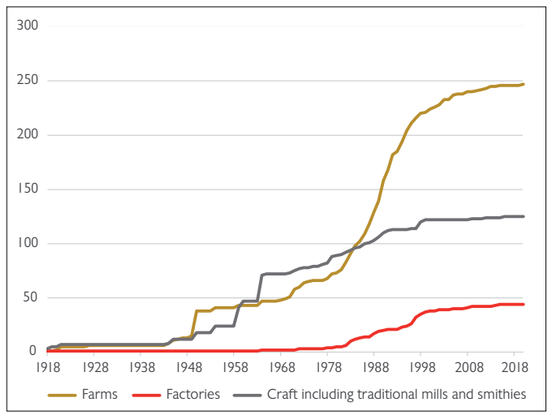



Figure 4. Listed properties (cases) in Denmark 1918-2020. *Source: Fredningslisterne and FBB at Slots- og Kulturstyrelsen, Centret for bevaring.*

**Errindlev Dairy was listed in 2000. This small butter factory was established in 1886, but the main building was renewed in 1913. The gable is characteristic for the second-generation dairies. The gable and ventilator cowl indicates the milk reception and separator hall. Photo CAJ 2007**



collected by the museums. Concerning the changing paradigms and the related changes in the built environment, it would transgress the space allowed in this article to describe it in any detail.

The material used here is the register over Listed Buildings and Buildings Worthy of Preservation *(Fredede og Bevaringsværdige Bygninger)* the so called FBB Register, as well as the individual cases of listing or restauration of industrial buildings at the Agency for Culture and Palaces *(Slots- og Kulturstyrelsen)*. The focus will be on the listed buildings *(fredede bygninger)* and not on the buildings worthy of preservation *(bevaringsværdige bygninger)*. Furthermore, it should be noted, that the material so to say represents the authorized heritage discourse in Denmark to use Laurajane Smith's phrase. The material is produced top-down, although everybody can propose a listing and the owners have a great say. In the last instance, it is the Minister for Culture who decides whether a building is listed.

One detail should also be noted. "A building" can be understood in surprisingly many ways and therefore it is problematic to establish an overview of the number of listed buildings. Instead, I have used the number of cases, which until now has been the unit of measurement in the administration. A case normally equals a property, and a property can comprise of one or several buildings, or it may be a construction, e.g., a statue or a crane. A case typical represents one owner and thereby one negotiating partner.

Finally, to understand the Danish context it is necessary to be aware of the ongoing debate about the position of agriculture, versus industry and service, where the dominating narrative has been, that the democratic and down to earth peasant-farmers drove the modernizing of the Danish society. Accordingly, the roots of Danish national identity should be that of a peasant-farmer.[9] This narrative has been challenged many times but is still prominent. If we were to follow that argument there should not be many listed industrial buildings in Denmark, again provided listing reflects the history of the whole society. Further, it should be noted, that the size of the main economic sectors is roughly the same as in our neighbouring countries like Sweden and Germany, although the industrial sector was and is slightly smaller. However, compared with our neighbours a significant difference is that there are only few areas dominated solely by industry in Denmark. As much as around half of Danish industry was located in greater Copenhagen until 1950, the processing of food is a comparative large industry and finally many firms are small or medium sized.[10]

## NUMBER OF LISTED FACTORIES – THE NUMBER OF CASES

Elsewhere I have suggested that there was a growing historical awareness of the technical and industrial development in Denmark in the years around 1900 like the better-known increasing interest in folk museums and outdoor museums during the same period.[11] This was a new phenomenon. It seems that the model collection of the polytechnic school (established 1829) from the late 1800's was used to illustrate historical development for the students and later the general public, for which the collection became open in 1907. At the same time, other more or less technical collections were established: The Post-and Telegraph Museum and The Railway Museum, both in Copenhagen and in 1907, The Maritime Museum in Elsinore in 1914. The point being that in the years around 1900 this kind of practical and promotional materials were for the first time used to demonstrate a historical development concerning technology.

1918 was the year when a broad coalition ranging from the conservatives over the liberals to the social democratic party in the Danish Parliament adopted the first Listed Buildings Act. The act made it possible to list builds of significant historical or architectural value and of more than 100 years of age, but with almost no economic support for maintenance purposes and with an expectation that the listed buildings should still be in use/inhabited. Supported by the Association for the Protection of Old Buildings *(Foreningen til Bevaring af Gamle Bygninger)*, historians and architects at the National Museum and the Royal Academy of fine Arts had proposed the act to the Danish parlament. Even the first listing *(see figure 1, 2 and 4)* included some traditional mills, manufactories, and the rigging shears at Holmen (the naval base in Copenhagen). This is worth underlining as listing at times

is reduced to a listing containing solely of palaces and manor houses. While in fact, the listing predominantly consisted of old townhouses besides the examples of early production buildings. The listing authority aimed at having all types of buildings represented on the list, and if possible to form clusters of listed buildings, cultural environments, or townscapes as the phrase were, instead of listing isolated buildings regardless of their surroundings as the listing act actually required.[12] The selection of the rigging shears was probably a reaction from the listing authority to the historical interest or identity building among navy officers at the time, which also meant that the Ministry of Naval Affairs allocated funds for repairing the crane. Simultaneously there appears to be a parallel to, or maybe inspired by, the protection of old cranes in Germany.[13] We know there were some contacts between the engineers of Deutsches Museum in Munich and the cultural historians at the National Museum in Denmark in 1914, when Oskar von Miller, the director of the Deutsches Museum, visited Copenhagen on his way to Stockholm and the open-air museum, Skansen. In 1932 both the rigging shears in Copenhagen and a herring smokehouse at Bornholm were used as illustrations in the book of Matschoss and Linder: "Technische Kulturdenkmale".[14]

Several "craft buildings," that is buildings related to craft-production, were listed from the 1940's, especially smithies in villages and at manors. During the 1950's and 1960's traditional wind and water mills were added *(see figure 4)*. All located in the rural parts of Denmark and listed as a parallel to the growing number of traditional farms, which were being listed. This was probably a result of a large registration and documentation project of traditional farms, which the National Museum carried out at the same time.[15] It is interesting to note that the listing of traditional farms (not the housing of agricultural workers) continued even after the museum project had ended, because it illustrates that listing takes time.

However, it was from the middle of 1970's the number of listed factories increased significantly. It lasted until 1998, when the number of new listings generally was reduced substantially. Part of the explanation for this slowdown in new listings was the preparation 1997-2010 and the implementation 2010-16 of a revision and new descriptions of all listings enacted before 1990 *(see figure 3)*.[16] This was followed by a special effort for improved maintenance of buildings observed to have been rundown or mismanaged, as well as delisting of some buildings, among those one industrial plant, a brewery in the town of Faaborg, and the only listed grain elevator, which stands in the Copenhagen Freeport. Both had been reused to an extent that did not leave much to tell about the former functions. Nevertheless, some factories were listed after 2000, but not many. The general picture is clear: a few industrial plants were listed around 1920, and the majority in the period 1978-1998. If we add technical facilities like lighthouses, bridges, hydroelectric plants, and railway stations the period of high activity is extended a couple of years, but the general picture remains the same *(see figure 2)*.

As of May 2021, there were 3.861 listed properties of which 208 were classified as present or former production facilities and a further 47 as technical facilities.

## STRUCTURAL CHANGE IN THE INDUSTRIAL ENVIRONMENT

Looking at the chronology of the industrial listings it appears probable to understand the two waves – the first exiguous and the second a little larger – as reactions to physical changes in the built environment of industry. The first listings can be seen as provoked by the renewal and relocations following the Second Industrial Revolution, the Age of Steel, Electricity and Heavy Engineering according to Carlota Perez or maybe even better to the broader concept of High Industrial Period according to Fellman and Isacson (in this issue).[17] During this period many companies reorganized their production space according to a kind of production or transportation line concept, they used larger buildings and more space. They still had their own power plant but preferred to locate near railways and harbour facilities, which meant a change of location from the old part to the new parts inside the urban area. It was in this period the planned industrial districts were introduced, the first being in the Copenhagen Free Port of 1894. Most industries stayed in the towns of the traditio-

**The Naval Dock Yard, Copenhagen, the Rigging Shears of 1750 and the Guard Building of 1745, both listed in 1918. Photo CAJ 2020.**

**Kongens Bryghus – the Royal Brewery – listed in 1945, built 1618, rebuilt after fires in 1632 and 1767. In the background, you can see a part of the Arsenal of 1611, listed in 1918, and the Royal Library of 1906. Photo CAJ 2007.**

nal urban system, although a new layer was added to the urban system in the form of many small new towns, where the fine masked net of small cooperative dairies were established. This meant that many of the first-generation production facilities from the 1840's or earlier were closed, sold, or reused. These changes have not been thoroughly researched. Therefore, I can only give examples such as the old Carlsberg Brewery, which the company put in moth bay around 1920. The two plants of Danish Distillers in Aalborg were concentrated in a single new plant at the harbour around 1930. In Copenhagen, the engineering shops of Burmeister & Wain, which were established in the 1840's, were rebuilt in the years around 1900 at the same place in the inner harbour. Their competitors, Caspersens Mekaniske Etablissement, had closed already in the 1860's and the area reused for dwelling for old seamen and their widows. In the 1930's flats replaced one of the largest textile factories in Copenhagen, Rubens Fabrikker built in the 1850's.

During the Third Industrial Revolution, or the Age of Oil, the Automobile and Mass Production, many of the characteristics already introduced intensified. The number of planned industrial parks or districts multiplied, as well as mass-produced single storied production buildings and new multi storied administration buildings. Further, the biggest concentration of industry moved from the Greater Copenhagen area to Jutland. In many ways, the changes concerning the buildings were the same as in the preceding period.

During the Fourth Industrial Revolution, the Age of Information and Telecommunications or the Hyper-Global Industrial Period, many companies continued to close their plants. Fewer opened new production facilities in Denmark, but the buildings became often more concentrated and larger than before. Storage and service expanded relatively; it was in this period the business introduced high storage. Besides, the introduction of containers and the accompanying changes in the ports, the Danish state established the motorway network after 1970. New bridges (Storebæltsbroen 1997-98 and Øresundsbroen 2000) eased the connections further. Following the growth of the service sector, some of the industrial parks in Greater Copenhagen like "Avedøre Industrikvarter" were never used for industrial production as they were planned but accommodated instead service industries. This later use spread to the rest of Denmark, especially East Jutland. One of the most visible signs of the changes were the gradual transformations of many harbour areas into dwellings and offices as the new container terminals moved further out near deep water. The electrification of the railway mainlines came late in Denmark, it began in the 1980's and is not yet completed. Several goods yards have been closed and sold for redevelopment. The central railway works in Aarhus was closed in 2009 and the works in Copenhagen are currently under redevelopment.

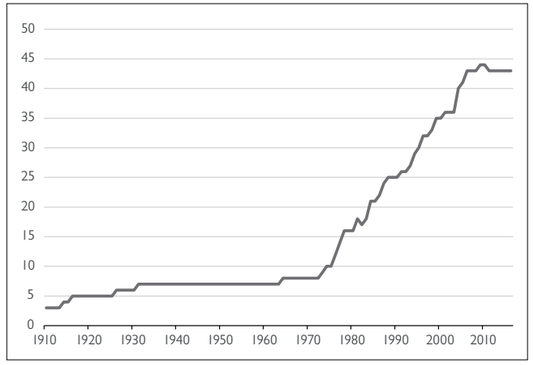



Figure 5. Number of industrial museums in Denmark 1910-2016. *Source: Danmarks Statistik.*

This sketch of the development in the built environment is not as well founded as it should be, however in Denmark the history of buildings including factories has traditionally been concentrated towards the designing and construction of the new buildings, more than on the development of the buildings after construction or whether the building has been reused. With this reservation, it appears, that structural changes in the industry – understood as both change in the individual building and in the entire system or paradigm of production – lead to demands for preservation. But it is also clear, that not every change triggers such a wish. The structural change around the Second Industrial Revolution seems as comprehensive as during the Third Industrial Revolution, while the number of listings during the Second Revolution was very modest compared to the Third Revolution. Therefore, we also must look elsewhere.



## WHAT TO LOOK FOR – THE LITERATURE ON INDUSTRIAL BUILDINGS

In the 1920's and 1930's there was a growing interest in economic, social and labour history among historians as well as a fascination of modern technical objects such as grain elevators, motorcars and aeroplanes among some Danish architects.[18] The latter was more or less copied from the Werkbund-yearbook, the writings of the architects around Bauhaus and from Corbusier. But only a few took an interest in the history of industrial buildings, and the interest seems to have died away in the late 1940's. Building histories of the Carlsberg Breweries, the Danish Distillers and the navy dockyard were carried out. The last one formed the thesis in 1933 of Christian Elling (1901-1974), who became the first professor in art history at the University of Copenhagen.[19] All three studies were published in connection with major restructurings and building projects. The first two studies were short texts sketching the building history of each of the two firms. The last one was an analysis of the planning and building history of the naval base especially during the 1700s using stylistic analysis in the context of baroque planning, but without much attention to the technical side of this military industrial complex. But later on, most of the buildings described by Elling have been listed like parts of the brewery and distillers. Although none of the texts saw their subject in relation to a general history of the layout of industrial plants, at least not in any detail, you could argue that a kind of schemata for analysing and evaluating industrial plants was created in this period.

A partial attempt to include industrial buildings in the history of Danish architecture was the book *"Danish way of building around 1792 and 1942"* from 1942 but focused on the two years mentioned. The art historian Harald Langberg (1919-2003), who headed the small staff of the Historic Buildings Council (*Det Sær-*

*lige Bygningssyn)* 1944-1967, wrote the first part. Langberg also published an overview in 1955 of Danish building culture from the Iron Age until the present, which included analysis of farmhouses and lower class urban housing as well as a few illustrations of factories, but without trying to analyse the latter.[20] Another book about Danish architecture in the period 1850-1950 from 1951, which was ground breaking as an early upgrading of historicism and because of the diversity of dwellings included, had not much to say about factories.[21] Nevertheless, it is important in this context because it breaks with the classical order and thereby opens up for analysing all sorts of buildings including factories. The editor of the book was the architect Kay Fisker (1893-1965), who was a professor and a leading figure at the school of architecture at the Royal Academy. In the 1930's he had supervised investigations of working class housing in Copenhagen with the aim of establishing the history of their layout as well as constructing new layouts for future public housing of which he designed several. In 1950 he presented the concept of "the functional tradition" for the Danish architects, a concept which had just been introduced by the British journal The Architectural Review.[22] Fisker used the concept to characterise a line in Danish architecture and indirectly his own work. In The Architectural Review the concept was illustrated by an analysis of artefacts from the harbour of Cobb at Lyme Regis demonstrating the beauty and functionality of the seawall and other maritime objects. The analysis was developed in 1957 by using warehouses and factory buildings as examples. However, this industrial side of the functional tradition was not transmitted to Denmark at the time. Instead Fisker and his associates had presented Denmark to their foreign colleagues as a country dominated by farmers, old village churches and modern welfare housing as well as Danish Design. No sooner than 1968 a small salute to the functional tradition, a pocket photobook showing traditional brickworks, was issued.[23]

It was not until 1979 an overview "The Buildings of Work" was published by the architect Jørgen Sestoft (1934-96) of the Royal Academy in a six volume series on Danish Architecture edited by the art historian Hakon Lund (1928-2013).[24] This seminal work had a relatively broad influence by giving an overview and demonstrating, that also buildings may tell about industrial development and work conditions and thereby further developing the schemata of what to look for.[25] Compared to an earlier and shorter essay the overview is much more specific about the layout and decoration of the buildings.[26] Sestoft uses the typology apparently developed at the German polytechnic high schools during the 1800's while the overall frame is chronological, in contrast to most of the English introductions to industrial archaeology. Sestoft also considers the use of decoration and suggests that especially joint-stock companies preferred decoration on their buildings to impress shareholders.

The book was linked to a research project called "Industrial Buildings and Dwellings", which was carried out 1974-79, financed by the Danish Research Council for the Humanities and initiated by Kristof Glamann (1923-2013), the first professor in economic history in Denmark, and with assistant professor Ole Hyldtoft (1943-) as daily leader.[27] The focus was on social and economic history, but a significant part of the energy was used on registration of factories and dwellings constructed in 1840-1940. To that end the project had already in 1973 arranged a seminar, where the British experiences with industrial archaeology as well as the work going on in Sweden were presented. The registration was later conducted in cooperation with the National Museum and the local historical museums. Here it must be noted that the administration of listings had just been transferred from the National Museum under the Ministry of Culture to a new agency under the Ministry of Environment, which first began to get involved from the mid-1980s. Meanwhile, some of the registrations were reworked into articles often inspired by the new British industrial archaeology or the Swedish "dig where you stand" movement with its "bottom up" approach and published in the newsletter of the research project – which was transformed into the present journal in 1979.

At the time there was a focus on growth or development theory among economic historians inspired by and to some extent in competition with the social sciences. As part of that, the interest in industrialization measured in quantitative terms

**Bies Bryggeri – a brewery in Holstebro built 1859-1904 and listed 1986. Photo CAJ 2011.**



was growing as well as the interest in the social context and consequences. These lines of research did not use the physical environment as a source. However, it is interesting to note that artefacts such as models of steam engines and films of industrial production were introduced in the teaching at Institute of Economic History during the 1960's.[28] The background was that the students had to offer a number of "non-written sources", to use the characteristic phrase, beside written sources for examination. During the 1970's and even prior to this there was no industrial archaeology in Denmark. Therefore, it was for good reasons that the project sought inspiration from the British Industrial Archaeology as developed in the 1960's and the activities in Sweden as personified by Marie Nisser. The connection to mainstream archaeology was weak or non-existent at the time, and still Danish archaeology has not moved much closer to the present times than the 1600's, although that may be changing.[29]

The interest in workers and the environment of work as opposed to traditional political history had a broad appeal, even at the political level, and in regard to listing and preservation it was expressed in the reformulation of the purpose of the listing act. Here the purpose clause was revised in 1980 to stipulate that cultural historic values also include buildings, as they can relate about living, working and production conditions. But as I have argued above, that had already been the ambition since the first listings in 1918. The difference was that this aim was now applied to buildings from the later part of the 1800's besides being stated directly in the law. In addition, another significant difference was that the administration of the listing act was supplied with more funds and manpower in the 1980's as far as it can be judged.[30]

A little later, the focus was directed towards the reuse of factories among engineers, planners, and architects. For example, a report from 1980 argued that reuse of factories would cost half the price of demolition and building of new ones.[31] In 1985 Sestoft published a booklet on the subject for the listing authority, and in 1996 another booklet on the adoption for office use of the grain elevator – Silopakhus B – in the Copenhagen Free Port. In 1997 the listing authority initiated a model study of transformation of the railway workshops in Aarhus, and before that some listed factories had been converted to office space, such as the textile plant, Usserød Klædefabrik.[32] The most influential and successful transformation was the reuse of another textile plant, Brandts Klædefabrik in Odense as a cultural centre and a commercial space, carried out in 1980-87 at the suggestion and after the design of the architect Kristian Isager (1946- ) and financed by private investors and the municipality.[33] The role of the former CEO of the company as well as the former workers were also important.[34] It was not a listed building, but protected by local planning and the partial use of it by cultural institutions was supported by the city of Odense. Part of the picture is also the transformation of the large old warehouses at the Copenhagen harbour front such as the facilities of the East Indian Trade Company by the Foreign Ministry back in the 1970's, which demonstrated that reuse at that scale was possible. In the same period – the 1970' and 1980's – there was a reaction against big planning and slum-clearance both among the public and among many planners.[35]

From around 1980 there seems to be a growing interest in historic architecture within the architectural profession or part of it, although the interest was not new as implied above. Besides the work of Sestoft, Hans Peter Svendler, a former co-owner of the architect firm 3xNielsen, published on "Bedre Byggeskik", a society for a better local building tradition established in 1915.[36] Jørn Ørum-Nielsen, an active architect too, wrote about row houses.[37] The architect and later professor Gert Bech-Nielsen was engaged in investigating the industrialisation of the town of Horsens together with the historian Jacob B. Jensen and the architect Ernst B. Kallesøe, as well as making building registrations in many municipalities.[38] Finally, Kristian Isager made building registrations of Odense and Svendborg.

At the same time, a change in the meaning of artistic work also followed. Where a classic work was seen as done and finished by one artist, the architect, and nothing therefore could be added or subtracted, this view was challenged by the wish to include the users, for example.[39] Besides, many architects realized that a work – or a simple house – might include several building phases and different layers, just like in archaeology. These changing views must have eased the appreciation of industrial plants as well as enhanced the prestige of reusing among architects. Later it has become common to use the term "transformation" instead of "restoration" at the two schools of Architecture in Denmark.[40]

In 1990 the non-governmental organization The Association for Building and Landscape Culture published an issue of their journal, which argued for the values of industrial environments as well as presented examples of preserved plants and encouraged to establish private institutions for the maintenance and running of industrial monuments.[41] In fact, voluntary groups have maintained a few plants with preserved machinery: Højer Mill (established 1976-78), Bruunshåb (1979-86), the Hammermill at Hellebæk (1982), Godthaab (1987-88), Fjerritslev Brewery (1983-84) and the Danish Energy Museum (1984), as well as some plants in connection with state supported museums: The Works Museum (1982-84), Cathrinesminde Tile Works (1981-93) and Hjort's Terracotta Factory (1995).

Concerning the listing praxis, a number of theme reviews was produced in the 1990's with short overviews and presentations of candidates for listing. They included: factories in industrial districts in Copenhagen Municipality 1992 – inspired by the equivalent in Stockholm, lime kilns and lime works in Denmark 1996, steel and concrete bridges in Denmark 1840-1900, 1996, cooperative dairies in Denmark 1880-1965, 1996, waterworks in Copenhagen 1999, small hydroelectric plants 2000 and state owned lighthouses 2001.

The next wave of interest in the industrial environment was generated by the cultural history museums and the newly formed Heritage Agency under the Ministry of Culture and was announced in 2003. The goal was to support research by the museums and especially establishing overviews of heritage interests to ease the coordination and prioritizing.[42] As a culmination of the effort, an outreach to the public was decided by the museums to be carried out in 2007, mainly in the form of exhibitions, talks and walks. In addition, the Heritage Agency published a book presenting 25 industrial environments of national significance from the period 1840-1970. This prioritizing was based on 161 industries of regional significance selected by cultural museums and regional culture environment boards. In 2008 an analysis of the ports of industrial society 1840-1970 followed, and in 2009 a theme issue of a historical journal, which was translated into the book "Industrial Heritage in Denmark" and published in 2014.[43] Further a number of smaller research projects at museums has been carried out developing certain themes like cement production, sugar works or industrial districts laid out after 1940, and the historian Henrik Harnow published an overview of Danish industrial environments in 2011.[44] It should also be mentioned that new booklets on reuse of factories and harbours were published in 2007 and 2010. Most of these initiatives were financed by a special grant by the Danish Parliament. Today the municipalities have inscribed 17 out of the 25 industrial environments of national significance in their local planning as cultural environments, but only one third of the 161 industrial environments of regional significance.[45] This has generated several analyses of industrial landscapes and districts.[46]

**Usserød Klædefabrik – Textile Mill, built 1803-1950 and listed 1982. Photo CAJ 2003.**

| | Total | agency | museums | societies | private | municipalities |
|---|---|---|---|---|---|---|
| -1970 | 2 | 2 | | | | |
| 1970-79 | 4 | | 1 | 1 | 1 | 1 |
| 1980-89 | 15 | 4 | 5 | 1 | 5 | |
| 1990-99 | 23 | 19 | | 4 | | |
| 2000-09 | 4 | 1 | | 2 | 1 | |
| 2010-20 | 2 | 1 | | 1 | | |
| **total** | **50** | **27** | **6** | **9** | **7** | **1** |

Table 1. Who proposed the listings of factories?
*Source: Sagsarkiv, Slots- og Kulturstyrelsen.*



There has also been a growing interest in the space between the buildings and its reuse as industrial parks especially by the architect and professor Ellen Braae and art historian Svava Riesto at the Copenhagen University, department of Landscape Architecture.[47] For example the landscape of Frederiksværk, one of the few mono-industrial small towns in Denmark, and the Carlsberg property in Copenhagen have been analysed. This appears to be connected to the growth of the discipline of landscape architecture in the last decades. The architect Thomas Birket-Smith, working in the planning department of the Aalborg municipality, has initiated books on the industrial architecture of Aalborg in 2002 and industrial architecture in Denmark in 2010.[48] Finally, the listing authority has repeated the study of the potential reuse of an industrial plant: a part of the naval dockyard at Holmen in Copenhagen.[49] The result is clearly more detailed and specific compared to the study of the locomotive works in Aarhus from 1997.

As we have seen the number of new listings was rather limited after 2000, but that was part of a general trend because of the preparation and execution of a re-evaluation of listed buildings. Therefore, you might argue that the effect of the last 20 years research remains to be seen. The increasing numbers of industrial museums and the number of their visitors as well as the number of publications indicates a growing interest in the subject.

To summarise: as of today there are 175 listed manufactories, factories, bridges, railway stations and lighthouses in Denmark, of which 44 are factory plants proper, almost all built before 1940. There are three exceptions: the car repairing shop in Aalborg from 1956 designed by the architect Arne Jacobsen, the coffee roaster in a high-rise glasshouse from 1968 outside Copenhagen and the torpedo workshop from 1954 at the naval dockyard. If you take the changing industrial structure during the period between 1840 and 1940 as a basis for evaluating, what has been listed, iron foundries and machine shops from the early period are missing as well as the small textile workshops at the moor in Jutland, and there is only one brickwork. From the second industrial revolution, there are listed five dairies, but none from the first generation of the 1880's. This is a reminder of the apparent paradox, that a leading selection criterion for listing has been and still is a buildings authenticity, while the listed building should also have a use in the future, which in most cases imply reuse and physical changes. Small electrical power stations from the first phase of electrification have been listed, but only one driven by a diesel engine, which was the standard and as much as five driven by water, which was the exception. None of the slaughterhouses outside Copenhagen, which were so characteristic of the Danish industrial structure, are listed. And most of the buildings of the dominant firm of the period, the shipyard Burmeister & Wain, as well as the Ford assembly plant, both in Copenhagen, have been demolished. The listing of buildings from the golden age of Danish industry or the second part of the high industrial period remains to be seen, not to say industrial districts, which according to the present legislation cannot be listed as areas.

In conclusion, the main point is, that research in industrial heritage since the 1930's and especially after 1970 as well as the interest from around 1980 in reuse has eased the listing. While the research at the museums between the years of approx. 2000-2010 was only followed by very few listings.

## WHO PROPOSED THE LISTINGS? – AND THE GENERAL APPRECIATION OF INDUSTRIAL HERITAGE

Most of the listings of factories were proposed by the listing authority or by museums, preservation societies or private persons *(see table 1)*. The majority participated in the project "Industrial Buildings and Dwellings" or with institutions, which were or had been involved. On the other hand, there was only one proposal by a private owner of a former brickwork, and the absence of engineers and companies are worth noticing as well.[50] The absence of the owners as proposers of listing can also be found among farm buildings, but not to the same extreme degree, and it is in marked contrast to owners of townhouses for living, where a majority of the listings were proposed by the owners themselves, at least after 1988.[51] This does not mean that factory owners, workers or trade unions have not taken an interest in industrial heritage, museums have been established and books published by these participants, but their engagement in listing has been minimal.

**Irma Kafferisteri – coffee roasting plant, built 1967 and listed without machinery in 2014. Photo Slots- og Kulturstyrelsen 2014.**

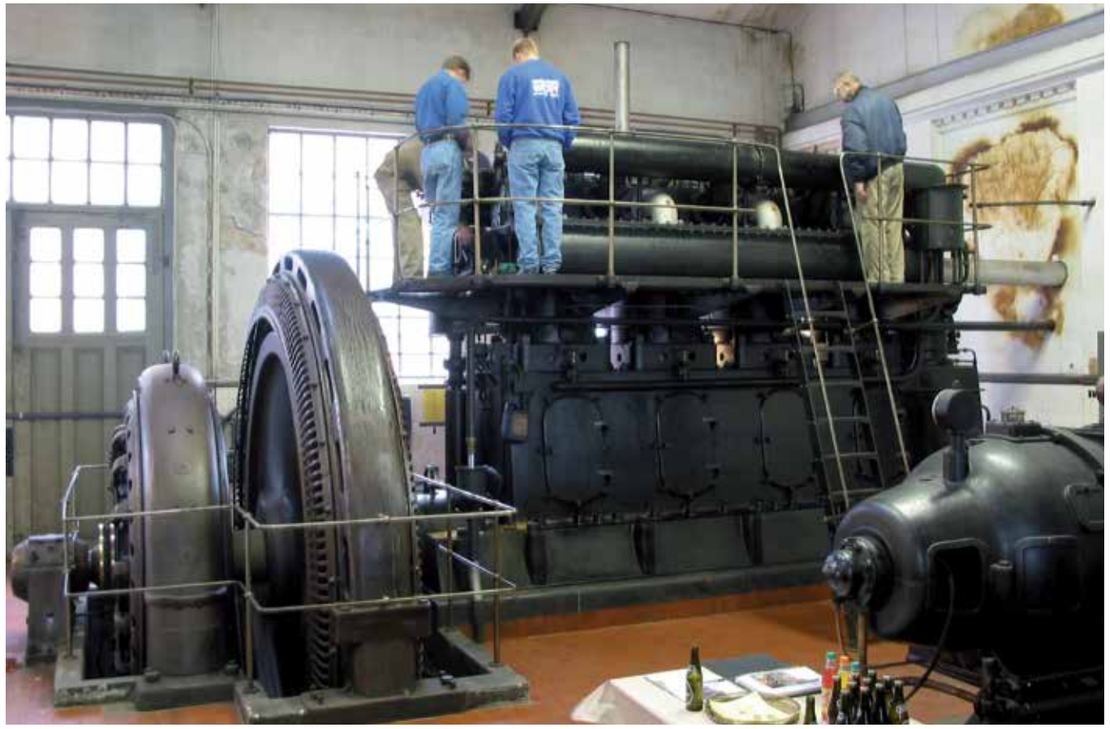


The development of the general appreciation of industrial heritage is of considerable interest. However, we only have a few attempts of measuring the interest and they are all from the last decade. The attempts have been made as part of the so-called cultural habit surrey (kulturvaneundersøgelse) and have been included in the survey because of the special focus on industrial heritage by the former Heritage Agency. According to these questionnaires, 14-16 % of the quested had visited a historic industrial site within the last year in respectively 2012 and 2023. This is a rather large share, when we compare with the 43 % questioned, who had visited a traditional town centre, the 41 % who had visited a palace or an old church in 2023 or the 16 % who had visited manor houses. Based on this material it appears that the public has accepted older industrial environments as heritage.

## THE INSTITUTIONAL FRAME

The listing act itself has not been changed fundamentally since 1918. As mentioned above it was formulated by the Danish parliament in 1980 that listing of buildings of architectural or cultural historic significance should illuminate dwelling, work, and production conditions. In 1997 the age limit for listed buildings was reduced from 100 to 50 years, although it was and still is possible to list younger buildings in exceptional cases. In addition, delisting became easier. This was under a social democratic minister in a social democratic-liberal government. In 2010 it became possible to list works of landscape architecture as standalone objects. Prior to this, works of landscape architecture might only be listed as surroundings to listed buildings. Finally, the last change in the listing legislation until now has been the possibility of limiting a listing to the exterior and the main structure of a minor group of buildings. This alteration was introduced in 2018 under a liberal minister in a liberal right-wing government.[53]

The change of the age limit did not affect the listing of industrial heritage in any significant way. The few factories younger than 100 years listed after 1997 did not counter the general slowdown or loss of momentum in the new listings. Both the revi-



**Thriges Kraftcentral – the small power plant of Thrige in Odense, built 1916 and listed with machinery in 2005. Photo CAJ 2002.**

sions in 1997, 2010 and 2018 may be understood as deregulation and reductions of public interference in private property rights, or as a tiding up to control and upkeep the remaining listings in a better way.

Back in 1980 a substantial rise in the funds as well as staff was perhaps more important than the declaration of intentions, although the funds were not targeted particularly at industrial heritage. The other substantial rise in 2003-2011 was a temporary grant targeted at the museums – not the listing authority. However, the grant, which maybe had the greatest impact, was the grant in 1974-79 from the Danish Research Council for the Humanities directed at the universities, which appears to have restarted the interest in the industrial heritage among museums and some university teachers. This also formed the background for the establishing in 1979 of the society for the protection of industrial environments.

For the listing authority at least two other projects have had higher priority. At first the registration of preservation values (bevaringsværdier) in cooperation with the municipalities (1987-2001) and secondly the revision of the listed buildings (2010-2016).[54)]

It should also be noted that the tax reductions, which are meant to support the maintenance of listed properties, work to the advantage of the owners of dwellings in contrast to the industrial firms.[55)]

Finally, the Historic Buildings Council *(Det Særlige Bygningssyn)* has recently proposed a strategy, which recommends concentrating on the development after 1945 and focusing on nine themes of interest for future listings. One of them is business and industry, and another is energy and mobility.[56)]

## DISCUSSION

At first it is worth looking into listing as a reaction to physical change. The argument that a building or object will vanish if it is not protected was and is often heard, at the time when listing was introduced and today. The argument fits somewhat with the data. The first small wave of listings of industrial heritage was carried out around 1920 that is in the years after the Second Industrial Revolution, which in general terms involved new layouts and locations of industrial plants as well as abandonment of plants built during the First Industrial Revolution.[57)] The second substantial wave of listings of industrial heritage occurred in 1979-2000. That is after the passing of the Third Industrial Revolution and during the unfolding of the IT-revolution, which also involved major changes in layout and location as well as in transportation, especially the abandonment of harbours and railways and the construction of motorways. The major changes in the building technology from 1950's should also be noted.



It is obvious that the argument has its limitation. Not every structural change or, on the micro-level, every abandoned building causes listing or preservation. Above I have argued for the importance of research among cultural historians and the growing interest in reuse among architects, especially during the 1970's and 1980's for the listing of industrial heritage 1979-2000. It developed interest, questions, and schemata through which industrial buildings of the 1840-1940-period might be appreciated. And as the architect Ola Wetterberg has argued in 1992 concerning Sweden both periods 1900-1920 and 1960-1990 saw an interest in "non-academic architecture", "folk-architecture" or "local-architecture" and thereby also an interest in cultural history as well as reuse, the environment and a sustainable future. This is also a part of the explanation of the few industrial listings before 1970. Beside the lack of knowledge about the layout of factories among historians and architectural historians, the artistic style of the period, when the factories were built, was not highly regarded. The change of attitude began with the book by Millech and Fisker from 1951 and culminated with "Danmarks Arkitektur" from 1979-81.

Furthermore, it should be noted that many of the listings were suggested by people with connection to the research project "Industrial Buildings and Dwellings," while engineers were absent in contrast to for example the USA, and that very few of the owners proposed listing, in fact only one.

It is likely that the institutional frame may explain the lack of proposals from the owners. Listing is a public regulation of private property without direct compensation. However, the regulation is to a degree compensated by tax reductions for expenses to maintenance as well as to property tax for dwellings. Nevertheless, this compensation appears to have only a minor effect for production buildings.

Furthermore, the institutional frame is also in all likelihood showing itself as a neoliberal deregulation of listing after 2000, which resulted in only a few listings of industrial heritage and delisting of other building types in contrast to growing knowledge of the schemata of industry as well as the growing public appreciation of industrial heritage. Alternatively, the stopping up might be understood as a necessary tiding up and not as a kind of deregulation resulting in fewer restrictions. In fact, the path was laid out in 1997 before the change of government in 2001 from a social democratic to a liberal-conservative government.

The institutional frame in the form of the listing act must also be part of the explanation of the few listings of factories before 1970. Most or at least many factories, which the owners closed before 1970, were not 100 years old, and according to the law only buildings older than 100 years could be listed until 1980 as a main rule. Thereafter it became easier to list younger building as an exception, and from 1997 the age criterion was reduced to 50 years, still with the possibility of listing younger building as an exception.

The overall conclusion must be that the interest and protection of industrial heritage is characteristic of the period 1970-2000 and that it distinguishes this period from the preceding years. Also, that there was an interest in technical heritage from the 1890's, but with few listings. Finally, the period 2000-2023 appears to be characterised by a growing appreciation of industrial heritage in the Danish public, but also characterised by deregulation in the form of fewer public funds and fewer new listings of industrial environments and buildings.

**Notes**

1) Ole Hyldtoft, Den industrielle kulturarv i Danmark i 30 år. *Fabrik og Bolig* 2004, p. 11-28. Henrik Harnow, *Danmarks Industrielle Miljøer.* Odense: Syddansk Universitetsforlag 2011, p. 11-56, Caspar Jørgensen, Industrial Heritage in Denmark, *Industrial Heritage in Denmark – Landscapes, Environments and Historical Archaeology,* Caspar Jørgensen and Morten Pedersen (eds.). Aarhus Universitets Forlag og Kulturstyrelsen 2014, p. 257-283.
2) There are two relative new books about listing in Denmark: Jannie Rosenberg Bendsen and Mogens Andreassen Morgen, *Fredet Bygningsfredning i Danmark 1918-2018.* Copenhagen: Strandberg Publishing 2018. Allan Tønnesen etc., *Hele samfundets eje Bygningsfredning i 100 år.* Odense: Syddansk Universitetsforlag 2018. As well as an old one, which still is essential: *Bygningsfredning gennem 25 Aar.* København: Det Særlige Bygningssyn 1943. But all three have an internalistic approach.
3) Ole Hyldtoft 2004, p. 11.
4) To a certain degree the following is inspired by Winfried Speitkamp, *Die Verwaltung der Geschichte.* Kritische Studien zur Geschichtswissenschaft 114. Göttingen: Vandenhoeck & Ruprecht 1996, as well as by Ola Wetterberg, *Monument & Miljö, Perspektiv på det tidliga 1900-talets byggnadsvård i Sverige.* Göteborg: Chalmers Tekniska Högskola, 1992, and the discussion of Braudel by Lucas: Gavin Lucas, *Making Time, the archaeology of time revisited.* London and New York: Routledge 2021, p.56-60.

5) See Anders Holtz, *Teknikens Tempel. Modernitet och Industriarv på Göteborgutställningen 1923*. Hedemora: Gidlunds Förlag 2003. Anna Storm, *Hope and Rust. Reinterpreting the industrial place in the late 20th century.* Stockholm: KTH 2008 pp. 35-36.
6) E.H. Gombrich, Art and Illustion. A study in the psychology of pictorial representation, (1960) London: Phaidon Press 5. ed. 1977.
7) You might also use the concept discourse; see for example Heike Oevermann and Harald A. Mieg (eds.), *Industrial Heritage Sites in Transformation Clash of Discourses*. New York and London: Routledge 2015, where they look at three discourses: heritage conservation, urban development and architectural production.
8) The interest in identity building has been growing in the last decades see: Laurajane Smith, *Uses of Heritage*. Abingdon: Routledge 2006. David Lowenthal, *The Past is a Foreign Country.* Cambridge University Press 1985. Anna Storm, *Postindustrial Landscape Scars*. New York: Palgrave 2014. *Constructing Industrial Pasts, Heritage, Historical Culture and Identity Transformation*. Stefan Berger (ed.). New York Oxford: Berghahn 2020.
9) Uffe Østergård, Denmark: A Big Small State – The Pleasant Roots of Danish Modernity. *The Danish Experience*. John L. Campbell, John A. Hall and Ove K. Pedersen (eds.). Copenhagen: DJØF Publishing 2006, p. 51-98. For a counter argument see Thorkild Kjærgaard, Om at bekende sig til virkeligheden. Copenhagen: Dansk Industri 2000.
10) *Industrial Heritage in Denmark – Landscapes, Environments and Historical Archaeology,* Caspar Jørgensen and Morten Pedersen (eds.). Aarhus Universitets Forlag og Kulturstyrelsen 2014, p.11- 25. For a business history approach and comparison of the Nordic countries see: *Creating Nordic Capitalism,* Susanna Fellman, Martin Jes Iversen, Hans Sjögren and Lars Thue (eds.), Basingstroke: Palgrave Macmillan 2008. Per Boje, *Vejen til Velstand,* 1-2, Odense: Syddansk Universitetsforlag, 2014-2020. Per Boje, Afskedsforelæsning på SDU af Per Boje, *Temp* 13, 2013, p. 177-190.
11) Caspar Jørgensen 2014, p. 257-283.
12) *Lov om Bygningsfredning af 12. Marts 1918 med fortegnelse over de i henhold til denne lov fredede bygninger,* Copenhagen 1920. *Bygningsfredning gennem 25 Aar,* p. 24-30, according to the former director of the National Museum and member of Det Særlige Bygningssyn Mogens Mackeprang.
13) Axel Föhl, *Bauten der Industrie und Technik*, Schriftenreihe des Deutschen Nationalkomitees für Denkmalschutz, Band 47, (1995) p. 32.
14) Ulrich Linse, Die Entdeckung der Technischen Denkmäler, Über die Anfänge der "Industriearchäologie" in Deutschland. *Technikgeschichte* 1986, vol. 53, p 201-222. Conrad Matschoss und Werner Linder, *Technische Kulturdenkmale,* p. 15 and 92.
15) Peter Henningsen, Kampen om den danske gård, Dansk bondegårdsforskning i 1800- og 1900-tallet, *Historisk Tidsskrift* 2019, p. 85-128.
16) Mogens A. Morgen, Gennemgang af Danmarks fredede bygninger 2010-2016, *Architectura* 2018, p. 74-111. And for a more critical assessment see Hanne Christensen, Fredningsgennemgangen, Resultater og konsekvenser, Allan Tønnesen op.cit. p. 179-216.
17) Carlota Perez, *Technological Revolutions and Financial Capital.* Cheltenham: Edward Elgar 2002, p. 8-21. I have tried to outline the changes in the built environment of industry in Caspar Jørgensen, Industrial Buildings and Landscapes in Denmark 1770-1970, Caspar Jørgensen and Morten Pedersen (eds.), *Industrial Heritage in Denmark. Landscapes, Environments and Historical Archaeology,* Kulturstyrelsen/ Aarhus University Press 2014, p. 27-61.
18) Caspar Jørgensen, Fabrikken og den store Stil, *Architectura* 1997, P. 42-76.
19) M.K. Michaelsen, Carlsbergbryggerierne og deres bygningshistorie, *Arkitekten* 1929, p. 135-192. Alf Cock-Clausen, Aktieselskabet De danske Spritfabrikker og dets bygninger. *Arkitekten* 1931, p. 125-172. Christian Elling and Viggo Sten Møller, *Holmens Bygningshistorie 1680-1930*. Copenhagen: Selskabet til udgivelse af danske mindesmærker 1933.
20) Harald Langberg and Hans Erling Langkilde, *Dansk Byggesæt omkring 1792 og 1942*. København: Den almindelige Brandforsikring for Landbygninger 1942. Harald Langberg Danmarks Bygningskultur. Copenhagen: Gyldendalske Boghandel – Nordisk Forlag 1955.
21) Knud Millech, *Danske arkitekturstrømning 1950-1951*. Kaj Fisker (ed.) Copenhagen: Østifternes Kreditforening 1951.
22) Kay Fisker, Den Funktionelle Tradition. *Arkitekten* M 1950, pp. 69-100. *The Architectural Review,* January 1950, *The Architectural Review,* November 1948, The Architectural Review, July 1957. Erdem Erten, The Hollow Victory of Modern Architecture and the Quest for the Vernacular – J.M. Richards and the functional Tradition. *Built from Below: British Architecture and the Vernacular.* Peter Guillery (ed.). London: Routledge 2011, p. 145-168.
23) Jørgen Rasmussen and Ole Meyer, *Gamle teglværker.* Copenhagen: Nyt Nordisk Forlag Arnold Busck 1968.
24) Jørgen Sestoft, *Arbejdets Bygninger.* Copenhagen: Gyldendal 1979.
25) See for example Ole Markussen, Danish Industry, 1920-1939: Technology, Rationalization and Modernization, Scandinavian Journal of History, 13, 1988, p. 233-256, especially p. 248-249.
26) Jørgen Sestoft, *Arkitektur, Idé og sammenhæng,* Copenhagen Arkitektens Forlag 1971, p.83-118.
27) Kristof Glamann, Præsentation af et forskningsprojekt. *Industrialismens bygninger og boliger* nr.1 1975, p. 3-9.
28) Kristof Glamann, *En blandet landhandel*. Copenhagen: Gyldendal 2002, p. 85.
29) An attempt was made in *Across the North Sea. Later Historical Archaeology in Britain and Denmark, c 1500-2000 AD*. Henrik Harnow, David Cranstone, Paul Belford and Lene Høst-Madsen (eds.) Odense: University Press of Southern Denmark 2012.
30) *Bygningsfredningsloven lov nr. 213 af 23-5-1979, forarbejder, folketingsbehandling samt andet materiale vedrørende loven*, Fredningsstyrelsen 1981, p. 27-40 and 42, where larger funds are described in mark contrast to the revision of the act in 1997 see: *Sortebog lov nr. 428 af 10. juni 1997 om ændring af bygningsfredningsloven og planloven lov nr. 429 af 10. juni 1997 om regionale faglige kulturmiljøråd,* Miljø- og Energiministeriet, Skov- og Naturstyrelsen 1997, p.31. For the broad approach in 1918 see: *Bygningsfredning gennem 25 Aar, p. 24-30 and Lov om Bygningsfredning af 12. Marts 1918 med fortegnelse over de I henhold til denne lov fredede bygninger,* Copenhagen 1920.
31) Jan Magnussen and Niels Olsen, *Erhvervsbygningers Genanvendelse*. Copenhagen: Geografisk Centralinstitut Købehavns Universitet, Rapport 13: 1980 Bygeografisk Skiftserie, p. 10.
32) Jørgen Sestoft, *Industribygninger og deres bevaring*. Copenhagen: Miljøministeriet, Fredningsstyrelsen 1985. Per Krogh, *Københavns ældre erhvervsområder – og deres fremtidige anvendelse*. Notat 84-8 Institut for Veje, Trafik og Byplan Danmarks Tekniske Højskole 1984. Tegnestuen John Allpas, *Ombygning af ældre erhvervsbygninger til boligformål – en eksempelsamling,* Copenhagen: Byggeriets Udviklingsråd 1985. Torben Pries and Axel Thrige Laursen, *Planlægning af erhvervsområder i Københavnsområdet,* Arbejdsrapport, Miljøministeriet Planstyrelsen 1992. Hanne Møller-Jensen og Gertrud Jørgensen, *Omdannelse ag ældre erhvervsområder – problemer og potentialer.* Forskningscentret for Skov- og Landskab. By- og Landsplanserien nr. 1997. *Omdannelse af ældre Erhvervsområder i Hovedstadsområdet 1998*. Copenhagen: Miljø- og Energiministeriets landsplanafdeling, Københavns Amt og Københavns Kommune 1998. Allan de Waal, *Nyt liv i maskinrummet syv eksempler.* Copenhagen: Realdania 2007. Thomas Birket- Smith, *Industriens Bygninger, Bygningskulturens Dag 2007.* Copenhagen: Kulturarvsstyrelsen 2007. *Brug havnen, Industrihavnens kulturarv,* Copenhagen: Kulturarvsstyrelsen 2010. Anja Meier Sandreid (ed.), *Omdannelse af erhvervsområder – fra vision til virkelighed. Et casestudie i transformation af erhvervsområder omkring Storkøbenhavn*, Copenhagen: Dansk Byplanlaboratorium 2023.
33) Personal communication 1995 with Kristian Isager.
34) Jens Toftgaard, Forvaltningen af den industrielle arv og identitet i Odense og Horsens. Urbane og museale strategier mellem industri-identitet og oplevelsesøkonomi. *Nye industrihistorier, Robotbyen Odense og andre industribyer i forandring.* Odense: Syddansk Universitetsforlag 2020, p. 376-381. Brandt-arbejdernes Historiske Forening, *Brandts Klædefabrik – erindringer fra arbejdslivet på en fabrik i hjertet af Odense*. Odense: Forlaget Brandts Klædefabrik 1993.
35) Arne Gaardmand, *Dansk Byplanlægning 1938-1992*, Copenhagen: Arkitektens Forlag 1993, p. 234-253.
36) Hans Peter Svendler Nielsen, Bedre Byggeskik, *Erhvervshistorisk Årbog* 1979, p. 98-126.
37) Jørn Ørum-Nielsen, *Længeboligen*, Copenhagen: Arkitektens Forlag 1988.
38) See for example Industrialiseringen i Horsens 1860-1940, *Arkitekten* 1976, p. 173-175. Horsensgruppen en præsentation, *Industrialismens bygninger og boliger,* no. 1 1975, p.32-36.
39) Christoffer Harlang, *Det åbne værkbegreb i arkitekturen,* Notat af 20. maj 2008, Slots- og Kulturstyrelsens arkiv.
40) Transformation, 22 nye danske projekter / 22 New Danish Projects, Copenhagen: Arkitektens Forlag 2011.
41) Jacob B. Jensen, Industrimonumenter, *Bygning By og Land,* 11, marts 1990, p.23-27.
42) Steen Hvass, Præsentation af satsningsområdet Industrisamfundets kulturarv. *Fabrik og Bolig 2004*, p. 5-10.
43) *Den Jyske Historiker,* Industrimiljøer, no.121-122, 2009. *Industrial Heritage in Denmark – Landscapes, Environments and Historical Archaeology,* Caspar Jørgensen and Morten Pedersen (eds.). Aarhus Universitets Forlag og Kulturstyrelsen 2014. Henrik Harnow, René Schrøder Christensen og Gitte Haastrup 2008, *Industrisamfundets havne 1840-1970*. Copenhagen: Kulturarvsstyrelsen. See also the review by Jørgen Elsøe Jensen in *Temp*. årg. 1, nr.2, 2011, p. 200-204. *Industri, industri, 25 stk. dansk kulturarv.* Copenhagen: Kulturarvsstyrelsen og Gads Forlag 2007. *2007 Evaluering af Industrikulturens År.* Rie Toldam Knudsen (ed.) Copenhagen: Sekretariatet for Industri Kultur 07. 2008. Morten Pedersen, Industrikulturens År 2007, *Fortid og Nutid,* 2009, p. 49-60. Henrik Harnow, *Danmarks Industrielle Miljøer.* Odense: Syddansk Universitetsforlag 2011.
44) For example Morten Pedersen, *De danske cementfabrikkers bebyggelsemiljø*. Odense: Syddansk Universitetsforlag 2008. Hanne Christensen, *Dansk Industri Sukkerfabrikerne,* Nykøbing F: Guldborgsund Museum 2007.
45) Per Grau Møller and Morten Stenak, Kulturmiljøer: serviceeftersyn af 25 års udpegninger. *By & Land,* september 2021 – nr. 132, p. 8.
46) Morten Pedersen, *Velfærdsstatens Industrilandskab, Om efterkrigstidens industrikvarterer i Nordjylland, en forskningsrapport,* Aalborg Universitetsforlag 2010. Mette Tapdrup Mortensen, Industrikvarterer i forandring Gladsaxe, Herlev, Albertslund og Glostrup. *Fabrik & Bolig* 2012, p. 14-35. Ann Merete Albæk etc., *Industrilandskabet omkring Danfoss,* Årsskrift 25 2012, Museum Sønderjylland Cathrinesminde Teglværk 2012. Ann Merete Albæk etc., *Industrilandskabet omkring Cathrinesminde Teglværk,* Årsskrift 26 2013, Museum Sønderjylland Cathrinesminde Teglværk 2013.
47) Ellen Braae, *Beaty Redeemed recycling post-industrial landscapes,* Risskov and Basel: IKAROS and Birkhäuser 2015. Svava Riesto, *Biography of an Industrial Landscape Carlsberg's Urban Spaces Retold,* Amsterdam University Press 2018.
48) *Fabrik Industriens Arkitektur i Aalborg,* Thomas Birket-Smith (ed.), Copenhagen: Fonden til udgivelse af Arkitekturtidsskrift B, 2002. *Industri . Arkitektur,* Thomas Birket-Smith (ed.), Copenhagen: Fonden til udgivelse af Arkitekturtidsskrift B, 2010.
49) Lundgaard & Tranberg Architects and Varmings Tegnestue, *Nyholm Forundersøgelse og Anbefalinger,* Copenhagen: Slots- og Kulturstyrelsen 2022.
50) This is based on a review of the material for 51 proposals of listing factories presented for the Historic Buildings Council (Det Særlige Bygningssyn).
51) I do not have precise documentation for this claim, but it is based on many years of participant observation.
52) RealDania, *Kulturarvsundersøgelse,* 2023, p. 23-24. and Kulturministeriet, *Kulturvareundersøgelse,* 2012, p. 73.
53) *See Rapport fra udvalget om bygningsbevaring*, Copenhagen: Kulturministeriet og Kulturarvsstyrelsen 2009. Skriftlig fremsættelse (16. december 2009) - L 93 (retsinformation.dk). L 44 - 2017-18 (oversigt): Forslag til lov om ændring af lov om bygningsfredning og bevaring af bygninger og bymiljøer. (Ændrede retsvirkninger for visse fredede bygninger). / Folketinget (ft.dk).
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