

The beer of the Danish golden age

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Introduction

Throughout the last fifty or, rather, hundred years, we have been exposed to an indoctrinating campaign in favour of the bottom-fermented lager and at the expense of the top-fermented ale.

When it is claimed that the founder of the industrial Carlsberg took his childhood and adolescence steps in 'a white ale brewery' in Brolæggerstræde (Paver Street), it is a truth with considerable modifications.

The brewing trade was in the middle of an epoch that was characterised by new liberalistic views, new knowledge, and an extensive consolidation of the craft enterprises; a competitive challenge which was enhanced by the poor state of the market of that age. New and revolutionary methods of production loomed in the horizon. The nascent continental industrialisation would soon attract more people to the cities. We know that in the mid-19th century, the new age of the brewing industry commenced; resulting in a change of nature in the second half of the century both with regard to products, ways of production, brewing methods, and brewing technology. The British beer production was already

known for its concentrated mass production with a widespread use of mechanical energy. Here, the breweries were among the trades that used steam engines at an early point and to a great extent.

The first trick in the economic clash

The industrial, capital demanding brewery would, however, also make its entry on the Continent. But where the British brewing trade continued to concentrate on top-fermented ale, the continental industrial breweries took the new, hot product of the age, the bottom-fermented lager from Munich, as their starting point. The driving forces behind this development were: Munich Brewer Gabriel Sedlmayer, Vienna Brewer Anton Dreher, Copenhagen Brewer JC Jacobsen, and Brewer Velten from Marseille.

From the 1850s, there was a rapid development and the 19th century's second phase of consolidation began. In this way, the Danish brewing trade developed into a battlefield already in the 19th century.

But what do we know about the Danish top-fermented ale, about brewing method and products, just before the bottom-



The Brølæggestræde brewery photographed in 2001 by Børk Jensen

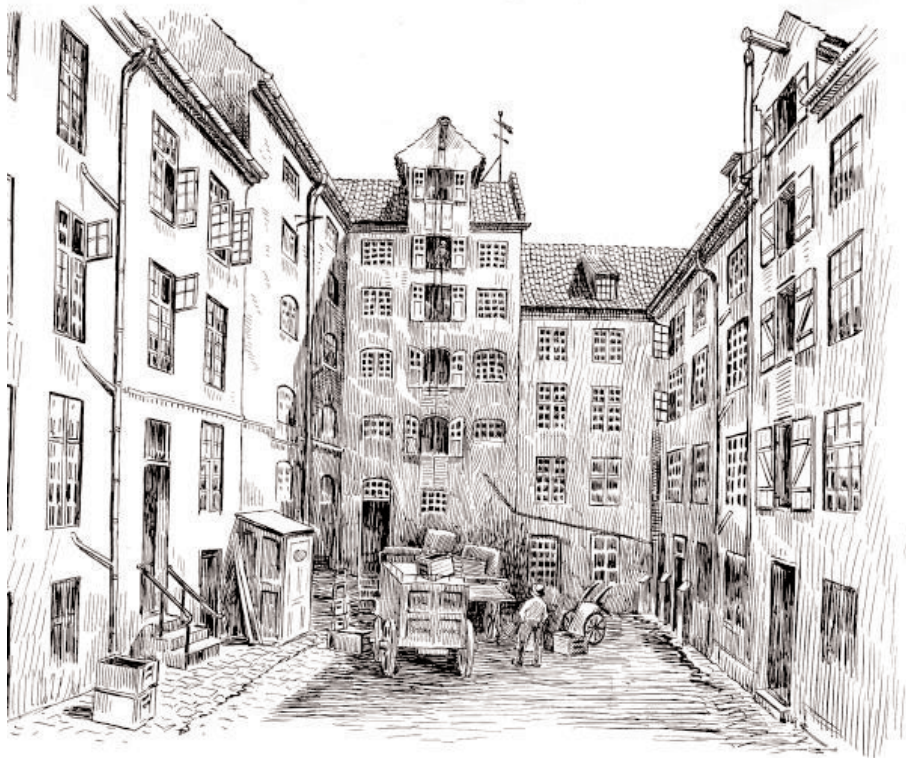


Figure 2. An undated drawing of the Brolæggerstræde brewery.

fermented lager and our country's industrialisation cracked a centuries old, local brewing technical history of development? We do actually know quite a lot, since two coinciding sources meticulously describe the brewing method and the physical frames of precisely the brewery of JC Jacobsen's father in Brolæggerstræde in the last years of the 1820s. In 1828, Christen Anthon Brøndum's serious guide for brewers, *Grundsætningerne for Ølbrygningen samt en Beskrivelse af*

den i Kiøbenhavn meest anvendte Bryggemetode (The Basic Principles of the Brewing of Beer and an Account of the Most Commonly Used Brewing Method in Copenhagen) was published; it had a beautiful preface by HC Ørsted. One of the book's model breweries is mentioned as Christen Jacobsen's brewery in Brolæggerstræde, which he had acquired just two years previously. As he was an extremely ambitious gentleman, he immediately produced a reconstruc-

tion project which was drawn up on paper by a certain Master Builder Blom. These detailed drawings, combined with Brøndum's process descriptions, give an excellent and complete insight into Copenhagen's golden age of ale brewing, at the time where this national style of brewing reached its qualitative culmination. Since then, the palates of the beer drinking people of Denmark have been flooded with masses of uninspiring imitation brew. For a long period of time, the bottom-fermented, continental beer types dominated, but recently the top-fermented ales, inspired by Belgian, British, and American brews, have provided new energy to the Danish 170-year-old imitation tradition. That the original Danish ale has been type casted as 'hvidtøl' [white ale] is due to combination of several factors:

- ~ The introduction of taxes on beer
- ~ An early enthusiasm among brewers for the terms 'white malt' and 'white malt kiln'
- ~ The ale breweries' doubts about the development
- ~ And not least, a number of historians' barely concealed and political excitement for the Danish industrialisation's influence on the brewing trade and its bottom-fermented products.

The economic victor - and the Myth of the Substandard Past

Why this massive and almost stubborn attempt to equate the early 19th century

top-fermented beer with today's weak 'white ale products' by so many historians? The phrase: 'J.C. Jacobsen's father had a white ale brewery in Brolæggerstræde', occurs, as mentioned before, again and again.

The only rational explanation must be found in the spirit of the time in which the many statements took place. Here, I naturally mean the long period of the 19th century where the Bavarian beer revolution had happened and the bottom-fermented lager was considered to be at the definitive top of the history of beer's league table. On the basis of this conviction, when the near historical background for this universally triumphant beer type was to be explained, being at the same time an outstanding Danish export hit in the apparel of Carlsberg's labels, it was probably tempting, in spite of several historical sources, to belittle the old types of ale and equate them both with the filthy, pre-industrial setting of old Copenhagen, on the one hand, and the product that the top-fermented Danish beer later had developed into, on the other hand.

In the 19th century's early years, they had in reality accomplished to brew beer in a quantity that provided an efficient utilisation of raw materials. They had developed the kiln technology to a point where a more gently treated and paler malt gave an increased extract during the brewing process. Theoretical knowledge combined with temperature and extract measurements actually provided the brewer with a completely new popular scientific-

ly grounded guarantee of rational actions during brewing and fermentation.

The Myth of the Weak Beer

When being occupied with guessing and making tentative calculations of the strength of the historical Danish ale, from the renaissance until the end of the 18th century, the conclusion has been that throughout the years, the beer managed to present a large palette of alcohol levels, cereal and kiln specific types of malt aromas, levels of subacidity, and of course a number of colour shades depending on the method of drying; both when it left the rural breweries and the large royal brewhouse in the capital.

Towards the end of the 18th century, the beer was brewed with less malt than previously, a completely 'new' set of original gravity levels, which was carried through to the first half of the 19th century. The question is whether the finished beer was weaker than before.

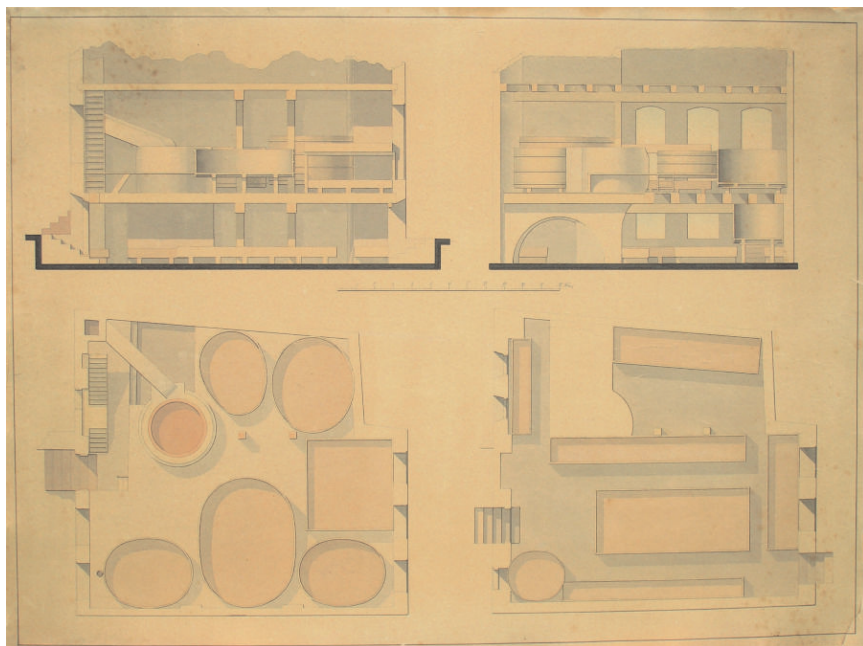
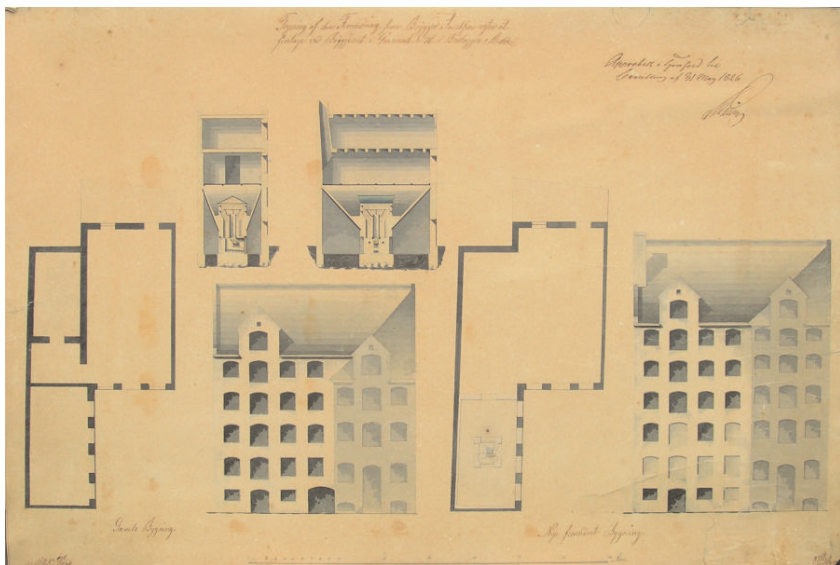
The ratio between the amount of malt used and the average final volume of cold wort is, however, close to the scales you find today in large as well as small breweries.

The most distinct difference between modern brewing and the craft brewing of the 19th century is that back then, they generally managed to produce three types of beer on the basis of the same brew. The reason why the old method of

brewing produced several types of beer must be found in the multi-split way in which they filtered and separated the wort from the mash during the brewing. It typically took place over three stages. The first wort produced the beer of the finest quality, the second wort produced the beer of medium quality, and the third wort produced the beer of the poorest quality. As the brewing process became increasingly refined, so did new mixes or blends, rinsings, and of course new beer type definitions. The very finest beer, which is still referred to as the double beer in the 19th century, was fermented with the 'pure wort' or 'first wort'. Brøndum reports that when the brewer produced double beer, he was not to boil the hops in water and thus 'dilute' the pure wort with the hop extract. Therefore, the hops were to be boiled in a part of or all of the pure wort.

And when we have a closer look at the more common quality beer and household beer, Brøndum has measured it thoroughly; both the extract level (level of sugars in the wort), the density of the wort, and the final level of alcohol.

He reports that the Danish beer was only rarely brewed for double beer or at a density of more than 1.04. The question is whether the craft brewer of the early 19th century in spite of a 'nice' density still managed to produce a weak beer product, a weak ale, or 'white ale product' because of a poor fermentation process. Brøndum delivered the proof of the opposite. For instance, he measured an



alcohol density percentage of 4.86 (approx. 6% alc/vol) in a beer where he had previously measured a 'wort density' of 1.048. Another beer with a density of 1.036 had 3.47% of alcohol (4.34% alc/vol). A third test revealed 3.75% of alcohol (4.7% alc/vol) in a beer based on a wort with a density of 1.041. The tests also enabled him to deduce a type of rule of the relationship between density, extract, and alcohol. His result corresponds quite well to the knowledge we possess today. He measured the beer with an alcohol density percentage of 4.86 and a wort density of 1.048 to have an extract of 12%, and the beer with an alcohol percentage of 3.47 and a wort density of 1.036 to have an extract of 9.5%.

'On the basis of this, one can assume that a little more than one third per cent alcohol is obtained in the beer for each per cent of solids in the wort'. Expressed in slightly more modern terms, he explained that if one knew the percentage of extract in the wort (what we call original gravity and measure in degrees Plato), one could operate with a fairly reliable basic ratio between this and the alcohol percentage of the final beer. It is still a rule of thumb that roughly one third of the extract turns into alcohol if one does not 'fiddle' with the enzymatic processes and adds 'funny' micro-organisms.

Brøndum is of the conviction that if one 'fermented for long enough and applied enough yeast,' all sugar would be turned into carbonic acid and alcohol. However,

it would not be a good idea, he points out, as the beer would not get the 'proper taste' and would most likely turn sour. He is of course right in the latter, since acetic acid bacteria and other nice micro-organisms would take over the job from the yeast and throw themselves at the otherwise unfermentable carbohydrates. Moreover, he believes that

the distiller must strive to obtain as much alcohol from his mash as he can, whereas the brewer should only strive to produce a suitable amount of alcohol relative to the other ingredients of the beer.

An entirely culinary approach to the beer, which brings up the concept 'flavour balance' at an early point in the Danish history of beer.

The mysterious colour blindness

Through history, the Danish ales have been provided with many imaginative, poetic, and technical names. But the two most commonly applied terms for historical top-fermented beer in our kingdom were quite trivially colour describing: brown beer and white beer. These two terms were used as main categories in order to distinguish between all the brews in the large stream of Danish ale.

And here, we have to hold on to our hats! Because it is vital to know that the brown beer could be strong or weak and the white beer could also be strong or weak. 'White beer' was not, then, an implicit

label for strength, but a practical and logical identification on a colour chart.

For obvious reasons, the term 'white ale' has been a mystery to many contemporary Danes, and the mystery is still kept alive on the many Danish bottles of beer that contain weak, dark, and sweet top-fermented beer. One of this world's many paradoxes in a beer industry which, over the years, has developed several bad habits semantically.

Why in earth call an extremely dark beer 'white'? Or even more stupid: call a beer 'dark white ale'? And utterly stupid: call a beer 'light white ale'? Mysterious practices which take place when linguistic colour blindness and a lack of historical knowledge controls the labelling and the marketing of the gradually more rare examples of light top-fermented, tax-free beer.

In order to understand why the brewers' of the 19th century were so enthusiastic about the term 'white', we have to have a closer look at the period where new techniques within malting had a revolutionary impact on brewing beer in the more advanced craft breweries. It was precisely at the end of the 18th century and in the beginning of the 19th century that the Danes, in general, and the Copenhageners, in particular, had the opportunity to say goodbye to the brown, often smoke flavoured beer and put transparent tumblers of considerably lighter, or 'white', top-fermented beer to theirs mouths. A reaction to the dark and

often smoky 'brown beer' was well on its way, although it had made up the production of the craft breweries, large and small alike, in Denmark and the remaining Europe for centuries. We also find the term 'brown beer' in parallel British and German terms: 'brown ale' and 'braun Bier'.

The white malt kilns

The white beer, with its basis in wind dried malt, has had its ups and downs throughout the last several centuries. The problem being, first and foremost, the farmers' primitive way of drying the malt in the loft which did not ensure a reliable durability, neither of the malt or of the beer, and as a consequence of these experiences, the craft brewers generally developed a fear of contact with the white wind malt.

But the technique was about to change and the brewers could clearly see the advantage of using paler malts. They provided a stronger extract and, consequently, a good base for either sweeter or stronger beer.

When malt is toasted or burned, the sugar turns partly, or completely, into colour and aroma. In other words, it required less malt to produce a given amount of beer if the brewer chose the pale malt rather than the dark malt.

Around Europe, they had experimented continuously and a revolutionary drying



Figure 7. Grain scales. at the Brolæggerstræde brewery Photograph dating from 1950.



Figure 8. Cellars at the Brolæggerstræde brewery Photograph dating from 1950.



Figure 9. Storeroom at the Brolæggerstræde brewery Photograph dating from 1950.



Figure 10. Brolæggerstræde brewery Photograph dating from 1950.

technology was under development. Already towards the end of the 16th century, malt kilns with an indirect heating of the green malt had been installed in a few larger European breweries. The fire was lit in an oven, a 'bear' or a 'pig', from where it was led through brick ducts under the kiln (kølleflagen). This technique could ensure a pale malt with more taste and less subacidity than the white, 'primitive' wind malt. A pleasant malt; entirely without the smoke flavour from the old kilns with the direct influence from the fire.

However, it was not until the end of the 18th century that it became customary to produce kiln dried pale malt in the breweries of Copenhagen. A process requiring

that the kilns were converted into so-called stove kilns which directed heat and smoke to the chimney through pipes going under the malt flakes; completely without the direct contact with the malt.

Henceforth, the white malt was considered quality malt. They were simply proud of possessing this new and revolutionary technology; the so-called white malt kiln. That the stove kiln/white malt kiln was also used for producing darker types of malt is another and rather more paradoxical story. The brewers still produced large quantities of brown malt, but now without the smoke flavour. This was ensured by a high temperature in the stove kiln or white malt kiln.

When the Danish ale breweries were to be compared with the newly emerged Bavarian beer breweries, they had to come up with a competitive name with a strong image for the good old type of enterprise that made a living out of brewing top-fermented beer. The term 'white ale brewery' was pulled out of the hat and was utterly cemented with the introduction of taxes on beer

When the white ale crept below the taxable level

Levies and taxes get the blame for an awful lot of things, and I will take the liberty to expand the list of transgressions with the sad story of the Danish ale, which turned itself into 'white ale' primarily because of the invention of taxes on beer. Not because the so-called white ale brewers were burdened with a tax they had to pay themselves, like the Bavarian beer producers, or had to collect from their consumers through a distinctly higher price on their beer. No, the majority of the producers of top-fermented beer went the other way. They skipped their previous varieties of potent top-fermented beer at a large scale in order to focus on the production of beer with an alcohol percentage somewhere below a 2.25 density in the future; in other words, beer that would avoid taxation, could be sold at a low price, and hopefully in large quantities. The term 'tax-free' has the most enchanting effect on most people. And just like that the Danish ale became qualitatively fixed in a far too familiar form

of weak and sweet so-called 'white ale'. The reason why this somewhat slushy product could compete with the bottom-fermented and taxed types of beer was purely because it was consumed along with nice quantities of cheap spirits. The arrival of a new tax would alter this Danish, newly popular drinking pattern: an extraordinary large increase of the levy on spirits, which was brought into effect 26 March, 1917. The consumption of the weak beer's alcoholic partner dropped dramatically after this; from 32 million bottles in 1916 to 2.4 million bottles in 1919. This made room for the Bavarian beer which boomed in reverse proportion with the decline of white ale and spirits despite the new and higher levies on the bottom-fermented types of beer, also.

A sudden exit for the Danish ale which adapted itself increasingly to hospital wards, nurseries, and the like and occasionally dressed in pixy hats and daffodils over the next century. This happened in the province, and it also happened in one of the proud flagships of the Danish world of brewing, the ale brewery par excellence, Kongens Bryghus (The King's Brewhouse).

All in all, in stark contrast to modern times where ale must be considered the hottest beer category in Denmark; fancied in its many shades by the most progressive fractions of the beer people. That is the way things go. In recent years we have witnessed a true revival of the top-fermented beer, as worthy brews of 'ale', far from the 'white ale' of the 20th century.

We actually had to go a couple of hundred years back in time in order to find good, detailed, and accurate sources that understood and described the very Danish style of brewing, before it was exposed to domestic Bavarian inspired and competitive initiatives as the start of the series of Danish imitation brews.

But that does not really make any less of our history, since it was at this point that ale brewing had reached its highest methodical and technologic level in this country. We even stand before a piece of brewing history that is not only of interest to the quite large group of generally beer interested people, but certainly also must excite the curiosity of the Danish micro-brewers and perhaps serve as inspiration in the efforts to create a new Danish or Scandinavian beer identity on a solid historical basis.

Past, present, and future - of the Danish ale

Today, the Danish beer trade has changed its scenography in a revolutionary way and made room for ale brewing once more. The top-fermented beer has recovered its honour at a couple of hundred breweries and in the mouths of the Danish beer consumers; and in several versions even its glory. Foreign ales are imitated at a large scale, but free-style experimenting with all kinds of ales also

takes place. We have been skilled at imitating the foreign successful brews. We have copied Gose, Porter, Munich Dunkel, Bock, Pilsner, IPA, Stout, and all sorts of pale, brown, and Belgian flavoured ales. We have brewed on oat, rice, corn, rye, wheat, and barley. Over 600 brews are produced today in small and large breweries in Denmark, and quite many of these brews are of international style, brewed on the basis of models from the big world: The Czech Republic, Germany, United Kingdom, Belgium, and USA. I would, however, be very pleased if the micro- and macro brewers of today would focus on the Danish historical brews for the purpose of producing genuinely Danish beer as it was brewed before the imitation wave came surging. The old style of brewing, flavouring, and storing should be explored thoroughly. Of particular interest are: a gentle infusion mashing, a separate multi-step boiling with large quantities of preferably stored hops, fermentation in open vessels, and a final, relatively short cask conditioning in raw casks.

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