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The Naked Barley Thorebygg and Norwegian Farmer's Ale

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ABSTRACT

Although now extinct, the naked (i.e. hull-free) barley variety Thorebygg was once an additive grain used in the brewing of farmhouse ale in Norway between the seventeenth and mid-nineteenth centuries and possibly earlier. This paper uses the concept of fictive terroir, combining social and cultural factors with its natural properties, to show how it was used in brewing ale. These factors explain the historical cultivation of Thorebygg and its decline under industrialization from the mid-nineteenth century. Thorebygg was probably cultivated as early as the Middle Ages on swidden plots, and later also on fertile open farmland. Hulled barley was the principal form of grain used in brewing and small quantities of other grains, such as Thorebygg, were added to improve the quality of the ale in color, taste and strength.

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Since the late twentieth century, advances in craft brewing have led to renewed interest in ingredients used in the past, such as old species and varieties of grains, as well as their history.¹ The interest has been a part of a broader development concerning a renewed interest in traditional food products and a reinterpretation of traditions to imitate such products.² Barley, particularly hulled barley, is both a contemporary and historically important ingredient in brewing. In common with a number of other cereals, barley is often divided into two varieties, depending on how tightly the grain is enclosed by the surrounding hull. The ancestral variety is “hulled,” which means that the grain is tightly enclosed in an outer husk to protect it. Through human selection, a “naked” form has been developed, in which the hull is so loosely connected to the grain that it easily falls off, often during harvesting and threshing.³

The naked barley variety Thorebygg in Norway is now extinct, but it was primarily cultivated as an additive grain to improve the quality of farmhouse ale.⁴ Thorebygg required nutrient-rich soils and was primarily grown as part of swidden agriculture but also on other farmland. This paper examines the history of Thorebygg, its brewing characteristics, cultivation methods, and the ale brewed from it in order to reveal the relationship between the historical taste (of beer) and its terroir. Literally translated from the French as “soil” terroir includes social and cultural factors, in addition to environmental conditions that influence the raw material and the taste of the resulting ale. This paper shows how such elements varied during the course of hundreds of years.⁵ Such

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knowledge is valuable not only for scholars but also for practitioners trying to recreate a historical food product. By providing a patina of authenticity, it can contribute to neolocalism and increase the commercial value of a product and contribute to innovation, or what Wedum terms “retrovation.”⁶ Accordingly, to contribute to the broader history of consumption of beer, *the aim of this paper is to document and analyze the barley variety Thorebygg with regard to how the barley was grown, brewed and influenced the taste of final product, the beer.*

I first elaborate the theoretical frame of *fictive terroir* as a point of departure for historical studies of terroir and taste. Thereafter, barley and naked barley are introduced along with traditional farm ale production methods in Norway. The paper describes the advantages and disadvantages of brewing with naked barley within the context of Norwegian agricultural history. Then I describe the historical and geographical distribution of Thorebygg in Norway and the methods of cultivation and consumption. Finally, I analyze the relationship between the aforementioned factors in the use of the grain, particularly with respect to brewing, and end with a discussion of possible reasons for the grain’s extinction.

Analytical Point of Departure: Fictive Terroir

Scholars and brewers have taken different approaches in reconstructing the historical relationship between taste and place. One approach is experimental archeology, such as used in Hans-Petter Sitka’s reconstruction of Celtic beer.⁷ The Norwegian Voss Bryggeri (Voss Brewery) approached the issue by combining an old strain of the yeast *kveik* and historical knowledge about ingredients, brewing and the culture of beer consumption.⁸

Such methods are impossible with Thorebygg, because it is extinct, so my research approach was to conduct a review of written sources about Norwegian farmhouse ales. In the eighteenth century and probably earlier, two types of ale were usually made on Norwegian farms. One type was of a superior quality, as it was strong (possibly 6–7 percent alcohol by volume), had a full-bodied taste, and was dark brownish in color. This type of ale was brewed for special occasions such as weddings and Christmas, whereas the second type, a lighter and paler ale, was brewed for everyday consumption. Liquids that were either sour or fermented were preferred to water, since drinking water often was of poor quality.⁹ In Norway, the distinction between ale of different qualities has been traced back to the Middle Ages and the Viking period, when legislation relating to beer and a subdivision into different types and qualities ale existed.¹⁰ In this paper, the focus is on the ale of superior quality (i.e. the first of the above-mentioned two types) based on the assumption that Thorebygg in particular contributed to production of that type of ale. Still, it is important to bear in mind that judgments and taste concerning ale have changed throughout history and should be considered when reading my analysis of the material.¹¹

The term *terroir* is a useful point of departure for my analysis because it incorporates the elements necessary to answer my research questions. *Terroir* is primarily associated with physical attributes, such as soil, climate and topography, and how they influence the characteristics of a product. Nevertheless, as numerous scholars have demonstrated, *terroir* also includes cultural and social elements in the production of local foods, which interact through dynamic and complex relations that change over time and are

socially constructed through narratives as well as sensory experiences.¹² Elements that may change and influence the taste of foods are the techniques used, such as demonstrated in the growing and storage of wine in Italy or changes in brewing methods in Norway.¹³ Furthermore, in the broad sense, terroir captures the fact that taste is influenced by class, economy and gender. For example, wealthy farmers in Norway in the nineteenth century often had better access to high-quality grain and could produce a better ale compared with poor farmers. The latter had to use low-cost additives such as juniper or alder in the brewing process to improve taste and color and to mask inferior taste due to low-quality grain or inadequate amounts of grain being used during brewing. Geographical differences in access to high-quality grain show the same pattern, since in the best grain growing areas, such as the lowlands north of Oslo, often there was no use of additives, while in mountain areas juniper or alder were common additives. Also, the purpose of the brewing was an influential element, as mentioned earlier in this section. All of the above-mentioned variables imply the existence of multiple terroirs, not only within a given space at the same time but also over time, leading to products having different tastes.¹⁴ This understanding opens the possibility for parallel and competing terroirs in the same space, including historically.

To capture the variation in terroirs empirically and not least the uncertainty involved in historical reconstruction of terroirs, I have introduced and developed the concept of *fictive terroir* in an earlier paper to emphasize that, irrespective of time and space, all terroirs are fictive – they are constructed. During my research, as many elements of the fictive terroir as possible had to be reconstructed over decades and centuries in order to fulfil the aim of this paper. Studies of elements of Norwegian farmhouse brewing, which include the taste of the ale, provide a background for construction of the fictive terroirs,¹⁵ but it is not possible to provide thorough explanations for each element throughout the whole period studied, which is from the mid-seventeenth century to the early decades of the twentieth century. I consider the following elements concerning terroir: the properties of the grain that made it attractive for brewing; how and where the grain was cultivated and processed; the brewing process; the cultural and social issues, including the reason why people brewed and why Thorebygg was supposed to improve the taste of the ale; and who cultivated and had access to the ingredients. Despite the uncertainties related to the collection and interpretation of historical data, the data presented and analyzed in this paper offer good insights into the issues discussed.¹⁶

Background on Barley and Brewing

Grain, particularly barley (*Hordeum vulgare* L.), is fundamental in malt beer brewing. Naked barleys are mutations of barley and were common in Europe before the beginning of the Common Era but were gradually replaced by hulled barley in the northern and southern parts of the continent. In the post-Roman period, the number of sites where naked barley was grown in Europe decreased significantly. Today, the practice of cultivating naked barley has almost disappeared from Western Europe, although it is still commonly grown in the eastern part of Eurasia: 95 percent of naked barley is grown in the highlands of Nepal, Bhutan, Korea, Japan, and Tibet.¹⁷ It is also grown to a lesser extent in Africa (e.g. in Ethiopia), Latin America, the USA, and Europe. Apparently,

China has the richest variation in naked barley today: for example, 78 varieties have been found in the mountainous Shangri-la region, where naked barley is mainly grown on sandy, poor, and degraded soils in marginal, mountainous, and hilly zones, as part of crop rotation.¹⁸

In traditional Norwegian farmhouse brewing, the grain is first soaked in water and then left to sprout. After some days, the grain is heated to stop the sprouting and the process turns it into malt. The malt is ground and mixed with water or a blend of water and juniper extract, in a process called mashing. Thereafter, often the mash is boiled before it is filtered to extract the wort (the liquid extract after mashing). Until as late as the early twentieth century, the mash was filtered in a bucket (*rostkar*) that contained local combinations of, for example, either rye straw or alder and juniper twigs, which was also a means of adding flavor and color to the wort. The wort was then boiled for either a short or a long time, after which hops were added. After cooling, yeast was added and the wort was left to ferment. Finally, the ale was stored in bottles or barrels.¹⁹ Thorebygg was used for brewing traditional farmhouse ale in Norway but only in small quantities and particularly when the best quality ale was required.²⁰ In general, traditional farmhouse ale brewing ceased at the beginning of the twentieth century.²¹ Hence, there is a lack of continuous brewing traditions on which to develop research regarding the use of Thorebygg.

Hulled barley and naked barley have different positive and negative properties that are relevant at different stages in the brewing process. Still, most efforts to breed barley have focused on hulled barley and in many cases research has been conducted on Canadian feed varieties such as Harrington.²² In this section, I focus on the aspects that may be observed or commented upon on the basis of the available historical data. Naked barley may malt more quickly than hulled barley due to a more rapid uptake of water, which may relate to its softer kernel.²³ In his research for an article on the reconstruction of early Celtic brewing and the taste of Celtic beer, Stika performed malting experiments on barley, including naked barley. One finding was that once the glumes (hulls) had been removed, naked barley germinated very quickly compared with hulled barley, since the toots and the coleoptiles could grow without any hindrance.²⁴ During mashing, specific polysaccharides are extracted from the hull, which may cause premature yeast flocculation during fermentation. This is not an issue with naked barley.²⁵ In traditional brewing the hulls are important in the process known as lautering, whereby the mash is separated into the clear liquid wort and the residual grain, because they allow for filtration. This is a potential problem when filtering naked barley. By contrast, the advantages of using naked barley are that it has significantly higher levels of malt extract and the beer quality is improved due to the absence of unwanted compounds in the hull, such as tannins and other polyphenols.²⁶

Despite extensive research on malting naked barley, the data on brewing trials remain limited.²⁷ Robert McCaig and his colleagues proved that it was possible to brew successfully with the naked barley varieties CDC Gainer, CGD McGwire and CDC Freedom. Although the extraction efficiencies from the naked derived malts were low, higher wort gravities were obtained due to the increased extract of the naked malts. Wort color and final beer color were higher for two of the naked varieties than for the third one, despite having lower soluble protein in the wort prepared from the malt based on the naked barley than the wort prepared from the ordinary commercial malt. There seems to be an

inherent difference in naked barley that results in higher color formation than found when using hulled barley. McCaig's team considered the fermentation performance acceptable in their tests, although to some extent it was retarded compared with that of hulled barley. Beer filtration was acceptable, and the final beer analysis proved that foam and long-term physical stability were excellent in beer produced using hull-free barley. The addition of naked barley significantly increased the foam stability of the beers, while the removal of the hull eliminated polyphenolic compounds. The latter frequently destabilize beer and produce haze, and therefore elimination of hulls leads to a more stable and brilliant beer. Sensory evaluations deemed the beers produced during McCaig's tests acceptable.²⁸

Norwegian Agricultural History and the Decline of Farmhouse Brewing

This article focuses on the southern part of Norway, which is the part of the country most suitable for grain production and where data about Thorebygg have been recorded. Because of Norway's northern latitude, there are only three or four months each year when grass can grow and grain can ripen. Food produced in those months has to be stored for usage in the rest of the year. The topography, with much of the land at high altitudes, increases the need for dependence on storage. From c.1500 CE up to the mid-nineteenth century, most of the farmers were either landowners or tenants who worked on plots that belonged to a larger farm. The numbers of farmers who owned their farm later increased, particularly in the nineteenth century. The ale consumed was brewed by each household on the farm. The most commonly used grain for brewing was barley. In the period from c.1500 CE to the mid-nineteenth century, there were few changes in people's diet, except for the introduction of the potato at the late eighteenth century. After the first decades of the nineteenth century, the numbers of people living in the countryside increased considerably.²⁹

In the mid-nineteenth century, a great transformation to a market economy occurred in Norway in general and agriculture in particular, which induced a series of demographic, social and cultural changes. The foundation of the old agricultural society (e.g. the rich supply of cheap labor) dwindled with mass emigration to the USA and increasing urbanization. Similarly, imports of cheap cereals of good quality, such as wheat and barley, increased.³⁰ These societal changes and the start of an industrial society influenced farmhouse brewing. In general, the downturn in farmhouse brewing started in the late nineteenth century and more or less ceased during the first decades of the twentieth century. The cultural role of beer had started to change even earlier. At least as early as the eighteenth century, beer was an important part of life from birth until death, as well as in everyday life and during celebrations. Gradually, this situation changed; for example, beer was no longer consumed by women during their maternity leave (the old Norse word for this was *barsøl*, which has since become named *barsel*). Beer was also an integral part of the ceremonies and gatherings held as part of funerals, called *gravøl* (funeral or wake). *Gravøl* could turn into three-days of heavy drinking and in the late eighteenth century the practice was strongly opposed by priests, among others, who were offended by the attendance of drunk farmers at church. When such ceremonies and the cultural importance of beer "died out," beer lost its deeper cultural importance and instead became a liquid drunk at feasts and celebrations. In addition to these cultural changes,

the traditional ingredients used in brewing, which were based on the farmers own laborious processes, were replaced with ingredients that could be purchased commercially. The cultural and societal processes in which beer had an important role changed due to industrialization and people moving out of peasant communities and into cities and towns. Therefore, the need for specialized grains such as Thorebygg was reduced.³¹

Historical and Geographical Distribution of Thorebygg in Norway

Naked barley was one of the dominant groups of grains in Norway in the Bronze Age (1800–500 BCE) and was well suited to the relatively warm climate at the time.³² Excavations from the Pre-Roman Iron Age site at Kveøya in the present-day county of Troms and Finnmark, in Northern Norway, revealed both hulled barley and naked barely. In the Iron Age, naked barley was replaced by ordinary barley (*Hordeum vulgare* spp.), which was adapted to colder, wetter climates and required less nutrient-rich soils.³³ A similar substitution is recorded as having occurred in Scandinavia in general during the same period.³⁴ The origin of the name Thorebygg is unknown, but Pontoppidan speculated that it derived from the Norse mythological god Thor (also spelled Tor in the literature) or place named Valhalla because it was the grain of gods and heroes.³⁵ This may indicate that the use of the grain resulted in a very good ale. Another possible origin of the name Thorebygg is that since the grain was most often cultivated in burnt fields, it could have been associated with lightning and fire, which in Norse mythology is associated with Thor.

A potential problem when analyzing the use of Thorebygg is that the literature, particularly the eighteenth- and early nineteenth-century literature, may confound Thorebygg with other grains or use different names for the same varieties of grain. As an example, a description dated 1745 from the Stavanger region refers to the grain as *Thorebygg eller himmelkorn* (“Thorebygg or grain from the sky”).³⁶ In 1793, Schlegel wrote that the grain that Norwegian farmers called Thorebygg was the same as “Davids Byg” and “Himmel-korn.”³⁷ In 1812, Floor noted that the barley *Himmelbygg* (*Hordeum vulgare celeste*) had two varieties – two-row and six-row – and that the latter was Thorebygg.³⁸ The appearance of Thorebygg might have given rise to the confusion to some extent, as it is described as looking like “wheat” or as a grain with similarities to both wheat and barley, with a loose hull. Some of the confusion is easy to understand. For example, in 1937, Knut Vik, a professor in agriculture at the Norwegian College of Agriculture (present-day Norwegian University of Life Sciences), wrote that the naked barley had similarities with wheat and rye because the grain fell away from the hull easily during threshing.³⁹

Some authors quite early on distinguished between Thorebygg and other grains. For example, in 1761 Essendrop described *Himmelbygg* as being twice as large as Thorebygg.⁴⁰ Agricultural experiments in the 1820s and 1830s revealed a distinction between Thorebygg and other varieties of barley, such as *Himalaiabygg*.⁴¹ Agricultural experiments in the period 1889–1917 made a distinction between two-row and six-row barleys and placed Thorebygg in the six-row group. The experiments showed that Thorebygg was the largest and heaviest grain of the barley varieties, averaging 74.1 kg per hectoliter (hl). Thorebygg needed longer to ripen (103 days) than other barleys and

had the lowest yield per m^2 (181 kg per 1000 m^2) compared with the barley, which had the highest yield (241 kg per 1000 m^2).⁴²

Thorebygg is mentioned as being different from barley and subject to taxation in 1661 at Sørum, in 1688 and 1695 at Vang, and in 1686 at Ringerike.⁴³ Vang is a municipality in the mountains in southern Norway, whereas Sørum and Ringerike are municipalities in the best lowland grain-growing areas of Norway, which are to the

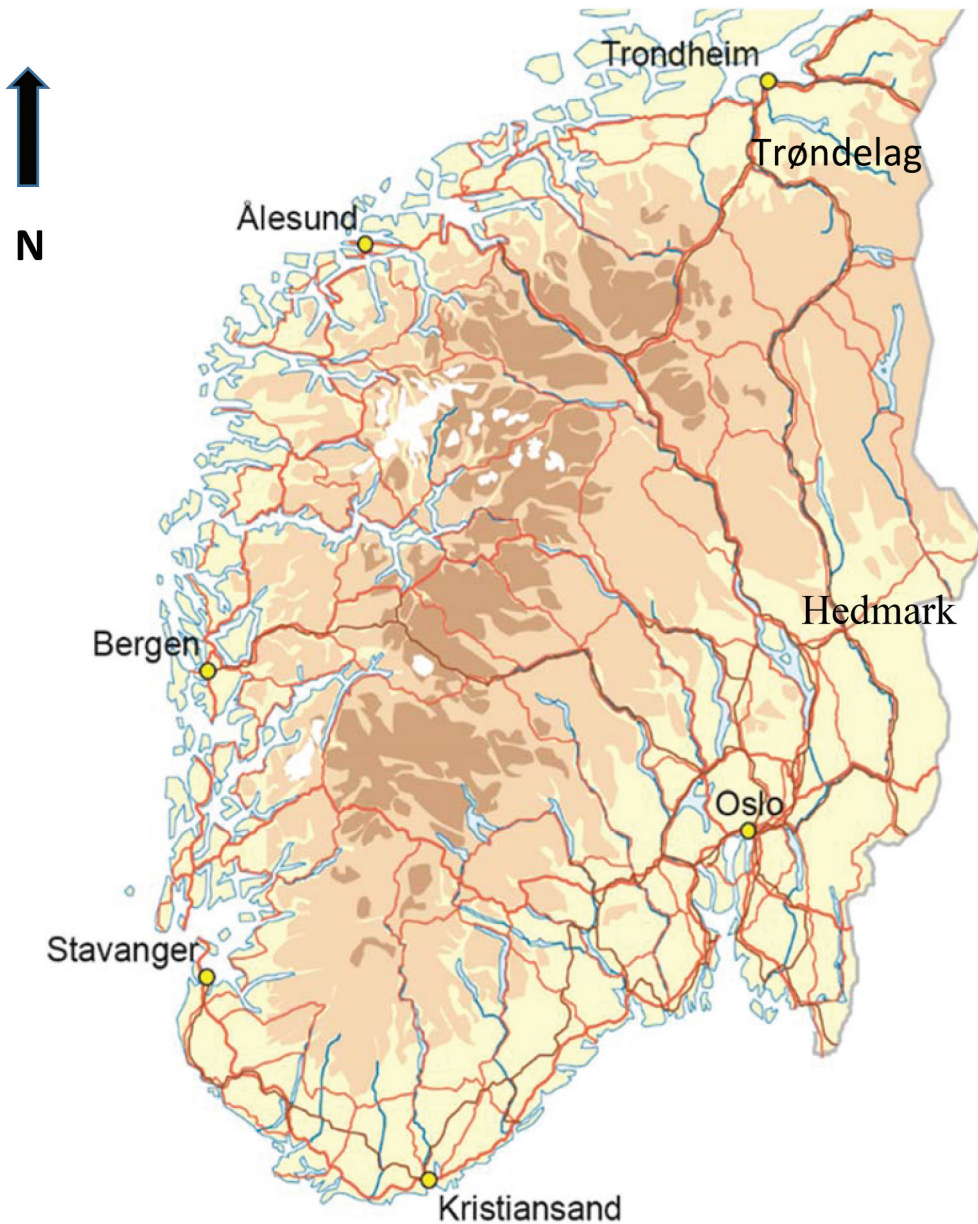


Figure 1. Southern Norway. Credit: Norwegian Mapping Authority, June 2020.

north of Oslo (Figure 1). The above-mentioned taxation records also document that Thorebygg was cultivated in a geographically large part of south-east Norway in the second half of the seventeenth century. Thorebygg's widespread cultivation, as well as being a valuable grain, is documented by the fact that it was subject to taxation according to King Christian V's law from 1687.⁴⁴ In 1715, Ramus reported the cultivation of Thorebygg from the same lowland grain-growing areas north of Oslo as mentioned above.⁴⁵

Statistics for the year 1809 give an interesting picture of the geographical distribution of Thorebygg but it is important to note that the Thorebygg variety and other high-quality grains and seeds were not sown every year and never in large amounts.⁴⁶ Consequently, the statistics are less reliable for those species and varieties of grains and seeds than for others, and they probably underestimate the production of Thorebygg and similar kinds of grains.

The statistics from 1809 show that 2093 barrels of Thorebygg grain were sown that year, of which 55 percent was sown in the county of Hedmark (now part of Innlandet County), which borders Sweden. Hedmark in general and the lower lying central area of the western part of the county in particular, has traditionally been very good for growing grains, due to the nutrients derived from the Cambro-Silurian bedrock. The 1809 statistics also show that only 1.6 percent of the total amount of Thorebygg was sown in Kristians amt (the former Oppland County, now part of Innlandet County) to the north-west and in a more mountainous area. In the other main grain-growing area in Norway, the present-day county of Trøndelag, which also has Cambro-Silurian bedrock, 19 percent of the total amount of Thorebygg was sown. In general, less Thorebygg was grown along the coast in the south, west, and north-western parts of southern Norway, with the exception of Stavanger amt (now Rogaland County). In general, barley prefers a dry climate, which is found in the eastern parts of Southern Norway. The locations in which Thorebygg was grown differed in size, which hinders precise comparison. Nevertheless, the main picture is that Hedmark, or parts of it, was a core area, together with Trøndelag.⁴⁷

A comparison of the total number of barrels of Thorebygg sown in 1809 and 1835 revealed that much the same amount was sown in each year: 2093 barrels in 1809, and 2126 barrels in 1835. That was less than 1 percent of all grain sown in those years. The amounts of other types of grain sown in 1809 were much lower than in 1835.⁴⁸ The year 1809 was one of famine in Norway, due to a British blockade during the Napoleonic Wars. Therefore, the statistics may indicate either that the conditions for cultivating Thorebygg were limited or that the amount used for sowing was stable, since it was probably an indigenous grain and not subject to import blockades, unlike other grains. However, according to many authors, it was only cultivated to a minor extent and often not regularly. Thorebygg was a fragile crop and did not tolerate much rain in the autumn. Therefore, it was recommended that only relatively small amounts should be sown and that in many cases farmers ought to favor other kinds of barley.⁴⁹

An interesting consideration is when the cultivation of Thorebygg ceased in the mid-nineteenth century, the municipal executive board in Røyken Municipality in the lowlands to the south-west of Oslo decided the prices of different types of grain on an annual basis. The prices are documented in annual records dating from 1837 to 1861. According to the board's records, Thorebygg was not traded in Røyken Municipality after 1861. However, it

must have existed at the beginning of the 20th century since experiments relating to the productivity of Thorebygg were conducted at Vollebekk (near Oslo) in 1905.⁵⁰

Cultivation Methods of Thorebygg

The cultivation of Thorebygg was based on swidden agriculture. There is evidence of possible slash-and-burn agriculture during the late Bronze Age and Pre-Roman Iron Age at Kveøya.⁵¹ The subsequent Norwegian tradition of swidden agriculture is described with the use of different words, which partly have their origins in different periods in history. The words also describe some differences in the practice regarding the type of forest, brushwood, or twigs that were burned, as well as how the burning was done. The oldest name for swidden agriculture is *Vål*, which refers to a type that was practised from the early centuries CE. The names *koss/kase* and *bråte* for swidden agriculture date back at least as early as the Middle Ages. The words *sve/svi* were used in the Middle Ages to some extent, but in general they are more recent words. In the late Middle Ages, there were regulations in 1490 concerning *rugbråter* (swidden plots used to grow rye). Many Norwegian words and surnames are derived from *bråter* and it is probable that most of them have their origins in the sixteenth and seventeenth centuries. The practice of *bråtebruket* (forest cut for burning and later cultivation of the land) expanded particularly in the seventeenth century in south-eastern Norway. The extent of regrowth of a forest after burning depended on the plans for the use of the plots. In some cases, the plots were turned into land for open agriculture, while in other cases there was a period of regrowth before new burning was done. The burning of forest or scrubs was performed both by Norwegian farmers, often in the case of *bråtebruket*, and by Forest Finnish settlers. In 1630 a royal commission declared that farms practising *bråtebruk* had to take care to preserve the forest. From the mid-seventeenth century, criticism increased, particularly against the Forest Finnish burning of forest in the areas bordering Sweden because it ruined the forest. In 1688 the practice was prohibited if it damaged the forests but that did not stop the burning. Nevertheless, the public prohibitions and other efforts to delimit the burning of forests gradually became effective and in general the slash-and-burn agriculture ceased during the early decades of the nineteenth century. The aforementioned efforts had the effect that the habit of sowing of rye in the autumn (*høstrug*) on burned plots was replaced with a sowing of it at open-field system of agriculture after the mid-eighteenth century. In Kristians amt, the practice of *bråtebruk* ceased in the 1860s to 1870s, due to the increased value of forest.⁵² These more general changes might have resulted in less cultivation of Thorebygg based on burned plots and an increase in the cultivation of it in open fields.

Swidden agriculture in Norway is often associated with Forest Finnish settlers who moved into the forests in south-east Norway from Sweden in the mid-seventeenth century. The above-mentioned different words and regulations show that at the time when the settlers arrived swidden agriculture was already established in Norway. There was also a geographically wide cultivation of Thorebygg at that time. The Forest Finnish settlers introduced *svedjerug*, a species of rye adapted for sowing in the warm ashes from burnt large spruce trees.⁵³ They also introduced barley varieties that originated in Finland and were suitable for swidden agriculture in deciduous forest, mixed forest and young forest. One of the varieties, named Maskin, was selected from farmland in

the forested areas in 1916 for further commercial cultivation. Since Maskin could be sown in warm ashes, it was a valuable malt grain and was developed into the Canadian Harrington barley, which is one of the most popular malting barleys today.⁵⁴

On the swidden plots, Thorebygg was usually sown together with vegetables such as turnips or peas, or with grains such as rye. The *kase*, *bråte*, and *sve* methods of burning the fields were used during the eighteenth and nineteenth centuries, in mountain communities in the valleys of Valdres and Gudbrandsdalen, and in lowland grain-growing areas such as Toten, Hadeland, and Hedmarken. According to Haslund, the *kase* method, which was based on burning deciduous forest, was most frequently used for cultivating Thorebygg and turnips. Aschehoug emphasizes that *brater*, which was based on burning alder, gave a very good yield of Thorebygg. The grain was sown in the ashes, often the day after burning twigs and small trees, or while the ashes still were warm. It seems that some type of burning was practised on farmland also before sowing Thorebygg: based on the diary of Christiane Koren written in 1809, Beyer states that the farmer whom she visited gathered grass on the open field and burned it, before sowing Thorebygg in the ashes on the next day. The swidden could be harvested for one or two years but seldom more. In some places, the practice of sowing rye and Thorebygg in ashes existed in the nineteenth century, when Thorebygg ripened in the first year and the rye in the second year.⁵⁵

Thorebygg required a long growing season and therefore ideally it should have been sown before other species and varieties. In the southernmost part of south-east Norway, the growing season in the eighteenth and nineteenth centuries was from mid-May to mid-September. Farther north, at Aker (close to Hamar in Hedmark), apparently grain was sown at the end of May or early in June, while harvesting was done at the beginning of September. However, since Thorebygg was sensitive to moisture, the crop often failed if the autumns were too wet.⁵⁶ Although sowing in ashes was preferred, Thorebygg could be sown on farmland or in soils where swidden agriculture not was practised. A diary covering the period 1749–1772, kept in the area with the best soils in Hedmark – the probable core area of Thorebygg given that in 1809, 55 percent of the recorded Thorebygg was harvested there – documents that Thorebygg was sown on cultivated land. It was often sown together with other grains and always in lesser quantities than ordinary barley.⁵⁷

Thorebygg grew well in dried bogs. Flor emphasizes that it grew best in dried bogs where the upper part had “rotted,” as well as in other types of soils that retained moisture well. According to Elieson and Flor, Thorebygg was a more suitable variety of grain than other varieties or species of grain for growing in such places.⁵⁸ Other authors describe how Thorebygg was cultivated in nutrient-rich soil or well fertilized soil consisting of clay mixed with “good” earth and sand, while soil that was too wet had to be avoided.⁵⁹ The data are not good enough to allow for the shares of Thorebygg based on respectively forest clearing, bog drainage and open agriculture to be calculated. In addition, there were geographical and historical differences in the cultivation.

Thorebygg was primarily used as malting grain and was supposed to have given a superb malt. According to Mitterpacher, Thorebygg was most frequently used in Norway. However, Thunæus, in his book about the history of beer in Sweden in the eighteenth and nineteenth centuries, refers to a relevant book published in 1727, titled *Swenska Åkermannen*. In *Swenska Åkermannen*, Mentzer wrote that naked grains were

cultivated to a minor extent but that they contained much energy and were well suited for use in the preparation of beverage, groats and flour.⁶⁰

Unfortunately, none of the sources explains the preparation process and the brewing in more detail than mentioned above. However, the process described in 1779 as used in Spydeberg, a present-day municipality in the former county of Østfold (now part of Viken County), in south-east Norway, may give some clues: Wilse writes “Good *blandkorn* (a mix of oats and barley) and Tore (Thorebygg) gives the best malt” and the best ale.⁶¹ The ordinary ale brewed in Spydeberg was based more on oats than on barley and did not have the same quality, but the quotation documents that Thorebygg was malted and that it was supposed to give the best ale. It also indicates that the grains were malted together, although different types of grains, in that case oats, hulled barley and naked barley, would have sprouted at different times. If grain sprouts are too long, they frequently cause an unwanted bad taste in an ale. If the oats and barley had been malted separately, the practice would have preserved the quality of the barley malt during the preparation of the ale.⁶²

Few descriptions exist of ale made using Thorebygg. Pontoppidan referred to a contemporary source that described the ale as “*sund og liflig*” (healthy and agreeable), whereas Mitterpacher described it as an “*ottima birra*” (excellent beer).⁶³

Still, Thorebygg was mainly used as a supplement to other malts and consequently the whole blend and processing probably would have had more influence on the ale compared with the use of a single malt. Thorebygg was also appreciated for use in cooking. Flour made from the grain was fine, white, and tasty, and used instead of wheat. It was also excellent for baking and for porridge.⁶⁴

During the nineteenth century, Thorebygg was considered more valuable than ordinary barley and this is reflected in the prices paid for it. In 1812, a barrel of Thorebygg cost 70 *riksdaler* (the same price as rye, wheat, and peas), while a barrel of ordinary barley cost 46 *riksdaler*. In Røyken Municipality during the 1850s, wheat, rye, Thorebygg, and peas were regarded as equal in value in general and on average they were priced 40 percent higher than ordinary barley.⁶⁵ Moreover, Thorebygg was announced for sale in Norwegian newspapers in the 1800s.⁶⁶

Discussion

What was the ale made from Thorebygg like? It is difficult to characterize the ale based on written sources, not only because taste and smell are subjective and varied in history,⁶⁷ but also because the malting and brewing would have strongly influenced the product.⁶⁸ Although historical descriptions are vague, ale made based on Thorebygg was supposedly very good. Since Thorebygg was a high-quality grain, it was used to improve the ale, particularly in terms of strength, taste and color. In the brewing industry today, naked barley is used in small amounts for special malts, namely caramel and black malts, to improve the taste.⁶⁹

Generally, a dark and strong ale was important at Christmas and on special occasions such as weddings, and it was frequently judged and commented on by other farmers; it was considered a shame if the ale was not dark and brown.⁷⁰ The tastings were rooted in the culture and linked to an occasion, particularly the pre-Christmas period each year.⁷¹ A relevant question is why strong, tasty and dark ales were preferred on those occasions.

One answer may simply be that such ales tasted better. Another possibility is that access to resources as more and better grain and knowledge led to improvements in the ale, and that wealthy farmers had easier access to such resources and could brew a better ale.⁷² Bourdieu's notion that the habits and tastes of the wealthier upper class spread down to the less affluent classes could be one part of the reason why the latter wanted a strong, tasty and dark brown ale. According to some local historians, local priests and officials disliked attempts by the less affluent to copy the customs of the wealthy.⁷³

Thorebygg could have played a role in the above-mentioned cases because as being a naked barley improved the color of the ale; it might also have improved the taste of the ale and increased the foam. These possible effects of a naked barley might have resulted from the removal of the hull prior to brewing.⁷⁴ It is also possible that Thorebygg increased the strength of the ale because the grains were larger than ordinary hulled barley. In general, large grains have more starch and consequently more energy for the yeast, resulting in an ale with a higher percent of alcohol. One issue not mentioned by other authors is that, due to being sown in warm earth resulting from recently burned trees or scrubs in the early summer, Thorebygg developed amylase, an enzyme that tolerates high temperatures. In brewing, high temperatures are maintained during the kilning and mashing processes. If the amylase in Thorebygg was adapted to tolerate high temperatures, it could have quickly started to convert starch to sugar after the grinding and mixing with water. Åsmund Bjørnstad has found parallel traits in the barley types Maskin and Harrington.⁷⁵ It is also possible that the use of Thorebygg meant that the ale lasted better in storage because removal of the hull eliminates polyphenolic compounds, which frequently destabilize beer and produce haze. Still, a higher alcohol content may also improve storage.⁷⁶

Primarily, Thorebygg was an additive grain meant to improve the quality of the ale, but Thorebygg could be added in different ways. One of them is that the Thorebygg was malted together with other grains. The description relating to Spydeberg in 1779 by Wilse indicates that Thorebygg was malted together with other grains. If that was the normal procedure, the advantages relating to the use of Thorebygg were greater than the disadvantages such as the fact that Thorebygg sprouted earlier than ordinary barley and oats and thus could easily have given the ale a bad taste. Moreover, it might have become too laborious to malt different grains separately.⁷⁷ However, there are examples of additive grains (such as rye) being malted before being mixed with barley malt, in order to improve the quality of the ale.⁷⁸ Alternatively, the main bulk of the barley might have been malted, while the additional grains for improving the ale would have been added as whole grains or as ground flour to the blend in the filtering bucket.⁷⁹ The literature indicates that many of the advantages of Thorebygg are related to the absence of a hull. This advantage might have been maintained by adding whole grains or possibly by adding ground whole grains because the hull fell off easily during harvesting or threshing.

A crucial question is why Thorebygg was cultivated on swidden plots. One possibility is that it was suitable for growing on them because the burning would have released large amounts of nutrients, which would have been beneficial for grain grown on the same plots in the first or second year after burning. Swidden agriculture, reflected in the words *kaser*, *braater*, and *sveer*, might often have been based on deciduous forest and brushwood. The preferred use of alder for swidden farming is interesting because the soil in

which it grows, and hence the alder itself, is rich in nitrogen, thus making alder a natural source of fertilizer. Ødegaard mentions that at the second half of the eighteenth century Thorebygg for malting was grown almost exclusively on swidden plots.⁸⁰ The reasons may be that it provided a better quality of the grain or that it reduced the risk caused by the vulnerability of the grain. It was recommended to sow Thorebygg to a minor extent, since a long growing season was needed, and the grain crops failed when conditions became too wet.

The high quality of Thorebygg made it attractive for brewing and for fine bread, but the difficult cultivation and relatively low yields reduced the amount of grain to be offered at the market. This resulted in high prices for Thorebygg, and higher than for ordinary barley. Higher prices of naked barley compared with hulled barley have been documented relatively recently, for example in Eritrea, Nepal and Latin America.⁸¹ In Norway the decline of farmhouse ale brewing at the latter part of the nineteenth century and easier access to high quality grain in the same period probably removed the demand for Thorebygg, and less incentives to cultivate it.

Thorebygg was probably originally based on swidden agriculture but was such a valuable grain that farmers who had access to nutrient-rich, good quality soils decided to sow it on their open fields. The limitations on burning of forest from the mid-eighteenth century onwards might have led to a transfer of both autumn sowing of rye and Thorebygg to sowing on open fields. The 1809 data relating to cultivation show that most Thorebygg was sown in the areas with the best soils, such as Hedmark and Trøndelag. A relevant question is whether cultivation on swidden plots as opposed to on open fields resulted in grains that influenced the taste of the ale. Rachel Black provides a parallel in her discussion of the effects of a change from pergola to Guyot systems for grape cultivation and the possible influences on the taste of the wine.⁸² There are no historical data about this issue with regard to Thorebygg.

The final part of this study concerns why farmers stopped cultivating Thorebygg. One reason was the shift from a labor-intensive agricultural society to an industrial society beginning in the second half of the nineteenth century. The shift increased the focus on grain crops with high yields and emphasized the simplification of the species and varieties of grain grown. Modern transportation allowed for the importation of cheap barley and wheat of good quality.⁸³ Another reason was that farmhouse brewing started to decline in the late nineteenth century as part of a longer cultural development in which beer lost its deeper cultural position. In general, the brewing of farmhouse ale ended during the early twentieth century. Consequently, there was less need for Thorebygg for brewing, and better and finer grains had entered the market for baking and making porridge. However, the fact that farmhouse brewing had lasted for so long might have contributed to the existence of Thorebygg until the beginning of the twentieth century.

Final Remarks

In Norway, Thorebygg was primarily cultivated on swidden plots, together with other grains and vegetables. Hence, its cultivation fitted with a wider practice of swidden agriculture, both historically in Europe and in other parts of the world today. The swidden plots led to the expansion of the cultivated areas but were also a way of reducing the risk of crop failure, particularly when cultivating climate-sensitive crops such as

Thorebygg. When crops were grown successfully, the reward was either a good ale or a good price paid for the grain. In this paper, I have documented the elements and links leading to the cultivation of a Norwegian variety of naked barley that contributed to an excellent beer – an “*ottima birra*,” as Mitterpacher, in 1784, described the ale made from it.

This paper also shows that researching the history of beer and brewing leads to new knowledge about the linkages between the taste of beer and the terroir in a broad sense. The paper documents the importance of social and cultural issues for the historical development of taste and terroir. Fictive terroir as a concept can be a systematic approach to this issue and the paper shows how it can be applied when conducting research. It may serve as a source of inspiration for brewers in their efforts to imitate historical beers and others who want to imitate historical taste and food in general. In turn, reconstructions of food and drink can help to improve our understanding of history and suggest yet another reason for preserving and developing our knowledge about terroirs in a broad sense and culinary history.

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Endnotes

1. Bråtå, “Local Traditions”; Patterson and Hoalst-Pullen, “Geographies of Beer,” 1–5; Schnell and Reese, “Microbreweries.”
2. Petruzzi and Savino, “Search”; Petruzzi and Salvino, “Reinterpreting”; Wedum, *Retrovation*.
3. Bouby, Boissinot, and Marival, “Never Mind”; Nelson, *The Barbarian’s Beverage*; Lister and Jones, “Is Naked Barley,” 339–340; Unger, *Beer*.
4. In this paper I use the term “ale” for the Norwegian farmhouse beer because that beer was based on the traditional yeast called *kveik*, which most often was taken from the top of the fermentation tube. The term “beer” is used when that type of liquid is referred to in more general term, including internationally. See Nordland, *Beer and Brewing*, preface.
5. Bråtå, “Local Traditions”; Ballarini, *La terra*, 64, 87. Ballarini describes some of the background for developing Parmesan cheese and historical changes in the milk used in the Parmesan.
6. Bråtå, “Local Traditions”; Flack, “American”; Schnell and Reese, “Microbreweries”; Holtkamp et al., “Assessing”; Argent, “Heading Down”; Wedum, *Retrovation*.
7. Stika, “Traces.”
8. Bråtå, “Local Traditions.”
9. Nordland, *Beer and Brewing*; Bråtå, Eltun and Thomson, *Fjelløl*.
10. Grøn, *Om Kostholdet*.

11. Classen, Howes, and Synnott, *Aroma*.
12. Bråtå, “Local Traditions”; Trubek, “The Taste”; Black, “Cultivating”; Shields-Argelès; “Tasting”; Amelien, “From Territory”; Hermansen, “Creating Terroir”; Overton and Murray, “Fictive place.”
13. Bråtå, “Local Traditions”; Black, “Cultivating.”
14. Bourdieu, *Distinction*; Bråtå, “Local Traditions”; Nordland, *Beer and Brewing*.
15. Bråtå, “Local Traditions”; Bråtå, Eltun and Thomsen, *Fjelløl*.
16. The primary data were sourced from texts in published books and leaflets accessed on the National Library of Norway’s website (www.nb.no). The search words were Thorebygg, Torebygg, Torekorn, Thorebyg, Torebyg, Tore***, Thore***. The texts relate to current knowledge about beer and naked barley. Knowledge from different countries and time periods contribute to the understanding of the use of Thorebygg and advance our knowledge of naked barleys and brewing.
17. Lister and Jones, “Is Naked Barley,” 442–443.
18. Li et al., “Indigenous Knowledge,” 645–649.
19. Bråtå, “Local Traditions,” 302.
20. Haslund, “Bygget,” 223.
21. Nordland, *Beer and Brewing*, preface. Nordland writes that although this brewing in general ended at the beginning of the 20th century, farmers and others in some communities continued traditional brewing in subsequent decades. In some communities, the main principles of this brewing are still followed today.
22. Edney and Langrell, “Evaluating the malting,” 18–22; Meints and Hayes, “Breeding Naked Barley,” 109. Later in this paper I comment on the fact that Harrington is based on the Norwegian barley species *Maskin*, which is a species well adapted to being heated during kilning, without loss of the enzymes’ properties.
23. Meints and Hayes, “Breeding Naked Barley,” 11.
24. Stika, “Traces,” 86.
25. Herrera and Axcell, “Induction,” 359–366.
26. Meints and Hayes, “Breeding Naked Barley,” 110.
27. *Ibid.*, 111.
28. McCaig et al., “Brewing with Canadian,” 123.
29. Bråtå and Lerfald, *Maten*.
30. Gjerdåker, *Norges Landbrukshistorie*.
31. Bråtå, Eltun and Thomsen, *Fjelløl*.
32. Bakkevig, *Problemer*, 56.
33. Bjørnstad, *Vårt*, 93–95; Sjögren and Arntzen, “Agricultural practices,” 6.
34. Eklund, *Changing Agriculture*, 18–20.
35. Pontoppidan, *Det Første*, 169.
36. de Fines, *Stavanger*, 119; Wilse, *Physisk*, 207.
37. Schlegel, *Statistisk Beskrivelse*, 207.
38. Flor, *Oekonomisk*, 88.
39. Vik, *Åker*, 99.
40. Essendop, *Physisk Oekonomisk*, 57; Vik, *Åker*, 104. Although Vik’s table on p. 104 is supposed to present experiments in the years 1914–1935, one column in the table refers to 1905 as the year of experiments with Thorebygg; Ødegaard, *Jordbrukslære*, 386–387.
41. Vevelstad, *Aust-Agder*, 25–26.
42. Ødegaard, *Jordbrukslære*, 386–387.
43. Ey, *Vang og Slidre*, 51, 88; Hexeberg, *Gardshistorie*, 13; Solberg, *Tingbok*.
44. Christian den V’s, “Norske Lov.”
45. Ramus, *Norriges Beskrivelse*, 69.
46. Aschehoug, *Statistiske*, 167; Haslund, *Bygget*, 222–23; Klokk, *Oversigt*, 42–43.
47. Klokk, *Oversigt*, 42–43.
48. *Ibid.*, 43.
49. Elieson, *Haandbog*, 28–29.

50. Røyken historielag, *Formannskapsprotokoller*; Vik, Åker, 104.
51. Sjögren and Arntzen, “Agricultural practices.”
52. Lunden, 1350–1814, 188–89; Ødegaard, *Kristians amt*, 134; Holm, “Skogfinsk,” 162–177.
53. Holm, “Skogfinsk,” 162.
54. Bjørnstad, *Vårt*, 154.
55. Aschehoug, *Statistiske*, 140–41; Beyer, *Christiane*; Glømme, *Jordbunden*, 156; Haslund, “Det norske,” 69, 86–89; Helland, *Topografisk-Statistisk*, 500; Klokk, *Oversigt*, 11; Skappel, *Træk*, 19, 53; Ødegaard, *Kristians amt*, 114; Østberg, *Norsk Bonderet*, 114; Wilse, *Physisk*, 207–208.
56. Dahl, *Aas Herred*, 12; Elieson, *Haandbog*, 28; Kraft, *Topographiske-Statistiske*, 255–258; Stange historielag, *Generalmajor*, 1–77; Vik, Åker, 104.
57. Stange historielag, *Generalmajor*, 1–77; Wilse, *Physisk*, 207–08.
58. Elieson, *Haandbog*, 28–29; Flor, *Oekonomisk*, 88.
59. Essendrop, *Physisk Oekonomisk*, 57; Sommerfeldt, *Agerdyknings-katekismus*, 86; Wille, *Beskrivelse*, 183.
60. Thunæus, *Ölets Historia i Sverige II*, 71–72. Thunæus refers to the work of Mentzer, Magnus. *Swenska Åkermannen*, Stockholm 1727, pp. 64 f.; Mitterpacher, *Elementti D’Agricoltura*.
61. Wilse, *Physisk*, 309.
62. *Ibid.*, 307–309; Nordland, *Beer and Brewing*, 21. Nordland refers to sources that explain that if oats and barley were mixed and left to sprout together, the barley would develop sprouts that would be too long because barley sprouted more easily than oats. This might have given the ale an unwanted bad taste.
63. Mitterpacher, *Elementti D’Agricoltura*, 228; Pontoppidan, *Det Første*, 169.
64. Essendrop, *Physisk Oekonomisk*, 57; Graarud, *Holmestrandiana*, 267; von Løvenskiold, *Beskrivelse over Bradsbiereg*, 59; Stange Historielag, *Generalmajor*, 48, 61.
65. Wikikilden. “Norges land og folk – Hedemarkens amt”; Røyken Historielag, *Formannskapsprotokoller*.
66. Examples are found in the newspapers *Morgenbladet* (no. 148), May 28, 1823; (no. 151) May 31, 1823 and *Den Constitutionelle* (no. 256), September 13, 1843.
67. Classen, Howes, and Synnott, *Aroma*; Heuts and Mol, “What,” 125–146.
68. Nordland, *Beer and Brewing*. The whole book concerns how different aspects of how brewing influences the ale.
69. Błażewicz, Liszewski, and Zembold, “Technological,” 37.
70. Bråtå, Eltun, and Thomsen, *Fjelløl*, 62–67.
71. Similar linkage to the culture is documented by Shields-Argelès, “Tasting,” concerning Comté cheese; and by Black, “Cultivating,” but the latter also describes a tendency for the wine to be taken out of the social context and given a new meaning. A similar example is the mentions in Norwegian newspapers about contemporary pre-Christmas tastings of Norwegian Christmas beer.
72. The importance of a good beer at weddings caused people to hire experienced local brewers, since an inferior beer was a bad sign for the future of the new spouses, Hermundstad, *I Manns Minne*, 103, 116.
73. Bourdieu, *Distinction*; Tøsse, *Bygdebok*, 42.
74. McCaig, Sawatzky, Egi, and Li, “Brewing with Canadian,” 123.
75. Bjørnstad, *Vårt*, 154.
76. McCaig, Sawatzky, Egi, and Li, “Brewing with Canadian,” 123.
77. Wilse, *Physisk*, 307; Nordland, *Beer and Brewing*, 21; Thunæus, *Ölets historia I Sverige II*, 145.
78. Thunæus, *Ölets historia I Sverige II*, 145.
79. Bråtå, Eltun, and Thomsen, *Fjelløl*, 45. The example of whole grains of rye (roasted) being added is from the late eighteenth century, whereas the example of flour is from the second half of the nineteenth century, in the mountain community of Skjåk.
80. Ødegaard, *Kristians amt*, 134.

81. Nigusse, “Barley,” 38; Upreti, “Status,” 112; Capettini “Barley in Latin America,” 122.
82. Black, “Cultivating.”
83. Bråtå and Lerfald, *Maten*, 137.

References

- Amelien, Virgine. “From Territory to *Terroir*? – The Cultural Dynamics of Local and Localized Food Products in Norway.” *Sosiologisk Årbok [Sociological Yearbook]* 3, no. 4 (2011): 85–106.
- Argent, Neil. “Heading down to the Local? Australian Rural Development and the Evolving Spatiality of the Craft Beer Sector.” *Journal of Rural Studies* 61, (2017): 84–99. doi:10.1016/j.jrurstud.2017.01.016. July.
- Aschehoug, T.H. “Statistiske studier over folkemængde og jordbrug i Norges landdistrikter i det syttende og attende aarhundrede.” In *[Statistical Surveys of the Population and the Agriculture in Rural Parts of Norway in the Eighteenth and the Nineteenth Centuries]*. Kristiania: H. Aschehoug & Co., 1890.
- Bakkevig, Sverre. “Problemer I Bronsealderens Korndyrking På Forsandmoen, Rogaland, SV-Norge [Problems in Bronze Age Cultivation of Grain at Forsandmoen, Rogaland County, South-West Norway].” *Ams-Varia*, no. 33 (1998): 55–62.
- Ballarini, G. *La Terra Del Buon Cibo: Storia E Futuro Delle Cucina Paramigiana. [The Territory of Good Food: The History and the Future of the Parmegian Kitchen]*. Parma: Monte Università Parma Editore, 2007.
- Beyer, Yngvil *Christiane Koren Dagbok 1809 [The Diary of Christiane Koren 1809]*. Oslo: Nasjonalbiblioteket/bokskap.no, 2017. Accessed April 30, 2018. <http://www.bokselskap.no/boker/koren1809/junj>.
- Bjørnstad, Åsmund. *Vårt Daglege Brød: Kornets Kulturhistorie [Our Daily Bread: The Cultural History of Grain]*. Ås: Vidarforlaget, 2010.
- Black, Rachel E. “Cultivating a Taste Landscape: Cooperative Winegrowing and Tastemaking in Carema, Italy.” In *Making Taste Public: Ethnographies of Food and the Senses*, edited by Carole Counihan and Susanne Højlund, 69–82. London: Bloomsbury Academic, 2018.
- Błażewicz, Józef, Marek Liszewski, and Agnieszka Zembold. “Technological Properties of Worts Obtained from Malts of Naked Barley Grain.” *Acta Scientiarum Polonorum Technologia Alimentaria* 6, no. 1 (2007): 37–48. Accessed February 2, 2020. https://www.food.actapol.net/pub/4_1_2007.pdf.
- Bouby, Laurent, Philippe Boissinot, and Philippe Marinval. “Never Mind the Bottle. Archaeobotanical Evidence of Beer-brewing in Mediterranean France and the Consumption of Alcoholic Beverages during the 5th Century BC.” *Human Ecology* 39, no. 3 (2011): 351–360. doi:10.1007/s10745-011-9395-x.
- Bourdieu, Pierre. *Distinction: A Social Critique of the Judgement of Taste*, Translated by Richard Nice. Cambridge, MA: Harvard University Press, 1984.
- Bråtå, Hans Olav. “Local Traditions as a Means for Commercial Production of Historical Beers: The Case of Vossaøl, Norway.” *Norsk Geografisk Tidsskrift–Norwegian Journal of Geography* 71, no. 5 (2017): 301–312. doi:10.1080/00291951.2017.1395909.
- Bråtå, Hans Olav, Ragnar Eltun, and Mette Thomsen. *Fjelløl [Beer in Mountain Valleys]*. Lillehammer: Østlandsforskning, 2018.
- Bråtå, Hans Olav, and Merethe Lerfald. “Maten og matproduktene i Gudbrandsdalen. Historiske hovedtrekk siden steinalderen.” In *[Agriculture and Food Products in the Gudbrandsdalen Valley since the Stone Age]*. Lillehammer: Østlandsforskning, 2012.
- Bridged, Meintz, and Patric M. Hayes. “Breeding Naked Barley for Food, Feed, and Malt.” In *Plant Breeding Reviews*, edited by Erwin Goldman, 95–112. Vol. 43. Madison, WI: Wiley, 2020.
- Capettini, Flavio. “Barley in Latin America.” in the Dry Areas). *Food Barley: Importance, Uses and Local Knowledge*. edited by Stefania Grando and Helena Gormez Macpherson. Aleppo: ICARDA (International Center for Agricultural Research, 2005. 121–126.

- Chris, Holtkamp, Thomas Shelton, Graham Daly, Colleen C. Hiner, and Ronald R. Hagelman III. "Assessing Neolocalism in Microbreweries." *Papers in Applied Geography* 2, no. 1 (2016): 66–78. doi:10.1080/23754931.2015.1114514.
- Christian den Vs Norske Lov [Christian the Vs Norwegian Law]. *Anden bog, kapitel 22* [Second Book, Chapter 22]. København, 1687 Accessed June 17, 2019. https://www.hf.uio.no/iakh/tjenester/kunnskap/samlinger/tingbok/kilder/chr5web/chr5_02_22.html
- Classen, Constance, David Howes, and Anthony Synnott. *Aroma: The Cultural History of Smell*. London: Routledge, 1994.
- Dahl. *Aas Herred*. N.A. Kristiania: Grøndahl & Søn Boktrykkeri, 1916. The Municipality of Aas.
- de Fines, B.C. "Stavanger Amtes Udførlige Beskrivelse 1745 [A Thorough Description of the Stavanger County 1745]." In *Skrifter Og Optegnelser Angaaende Norge Og Forfattere Efter Reformationen [Writings and Notes about Norway and Authors after the Reformation]*, edited by N. Nicolaysen, 103–243. Christiania: Johan Dahls Forlag, 1870.
- Edney, M.J., and D.E. Langrell. "Evaluating the Malting Quality of Hulless CDC Dawn, Acid-dehusked Harrington, and Harrington Barley." *Journal of the American Society of Brewing Chemists* 62, no. 1 (2004): 18–22. doi:10.1094/ASBCJ-62-0018.
- Eklund, Markus. "Changing Agriculture: Stable isotope analysis of charred cereals from Iron Age Öland." Master's Thesis in Archaeological Science, University of Stockholm, 2019.
- Elieson, Peter. *Haandbog for begyndene Landmænd i Norge*. A Handbook for Young Farmers in Norway. Christiania: Jacob Lehmann, 1835.
- Essendop, Jens. "Physisk Oeconomisk Beskrivelse over Lier Præstegield i Aggershus stift i Norge." In *[A Description of Lier Parish in Aggershus County in Norway from Geophysical and Economic Points of View]*. Kiøbenhavn: N.p., 1761.
- Flack, Wes. "American Microbreweries and Neolocalism: 'Ale-ing' for a Sense of Place." *Journal of Cultural Geography* 16, no. 2 (1997): 37–53. doi:10.1080/08873639709478336.
- Flor, P.P. "Oekonomisk Reise til Lister og Jedderen foretagen i Efteraaret 1810." In *[An Economic Journey to Lister and Jedderen in the Autumn of 1810]*. Christiania: Norges Vel, 1812.
- Gjerdåker, Brynjulv. *Norges Landbrukshistorie III 1814-1920. Kontinuitet og Modernitet [Norwegian Agricultural History, Part III 1814-1920. Continuity and Modernity]*. Oslo: Samlaget, 2002.
- Glømme, Hans. *Jordbunden I Buskerud fylke [The Soil in Buskerud County]*. Kristiania: Grøndahl & Søn Boktryggeri, 1921.
- Graarud, G. *Holmestrandiana, 3die Del av Holmestands Historie [Holmestrandiana, the History of Holmestrand, Part 3]*. Holmestrand: Jarlsbergs Bok og Akcidens Trykkeri, 1929.
- Grøn, Fredrik. *Om Kostholdet i Norge Indtil Aar 1500 [The Norwegian Diet before Year 1500]*. Oslo: Det Norske Videnskaps-Akademi, 1924.
- Haslund, Svein. "Det norske landbruks historie The History of the Norwegian Agriculture." In *Landbruksboken: En Samlet Fremstilling Av Læren Om Landbruket, Dets Forskjellige Greener [The Book about Agriculture: An Overall Presentation of Knowledge about Agriculture and Its Various Parts]*, edited by Ødegaard Nils, 6–192. Kristiania: H. Aschehoug & Co, 1919.
- Haslund, Svein. "Bygget Som Ølkorn I Det Vestlandske Havreområdet [Brewing on the Basis of Barley in the Western Parts of Norway Dominated by the Oats]." In *Or Noregs Bondesoge [From the History about Norwegian Farmers]*, edited by Svein Haslund, 208–226. Oslo: Noregs Boklag, 1942.
- Helland, Amund. *Topografisk-Statistisk Beskrivelse over Kristians Amt [A Description of Societal and Natural Conditions in the Kristians County]*. Kristiania: Aschehoug & Co, 1913.
- Hermansen, T.H.M. "Creating Terroir: An Anthropological Perspective on New Nordic Cuisine as an Expression of Nordic Identity." *Anthropology of Food* 57. Accessed December 12, 2021. <https://journals.openedition.org/aof/7249>
- Hermundstad, K. *I Manns Minne: Gamal Valdres-Kultur III [The Old Cultural History of the Valdres Region, Part III]*. Oslo: Norsk Folkeminnelag, 1944.
- Herrera, V.E., and B.C. Axcell. "Induction of Premature Yeast Flocculation by a Polysaccharide Fraction Isolated from Malt Husk." *Journal of the Institute of Brewing* 97, no. 5 (1991): 359–366. doi:10.1002/j.2050-0416.1991.tb01076.x.

- Heuts, Frank, and Annemarie Mol. "What Is A Good Tomato? A Case of Valuing in Practice." *Valuation Studies* 1, no. 2 (2013): 125–146. doi:10.3384/vs.2001-5992.1312125.
- Hexeberg, Thor. "Gardshistorie for Sørli: Del 1. [The History of the Sørli Farm, Part 1]." *Sørum-Speilet* 11, no. 1 (2005): 11–16.
- Historielag, Røyken. "Formannskapsprotokoller" [Municipal Executive Board Protocols]. Accessed April 30, 2018. <http://historielaget.no/global/upload/NBPPQ/files/Formannskapsprotokoller.pdf>.
- Historielag, Stange. *Generalmajor Peder von Todderud Sin Annotiationsbog Fra Aggrgaard 1749-1772 [Major General Peder von Todderuds Agricultural Records from Aggrgaard 1759-1772]*. Stange: Stange historielag, 1998.
- Holm, Ingunn. "Skogfinsk Og Norsk Svedjetradisjon [Forest Finnish and Norwegian Traditions for Slash and Burn Agriculture]," *Heimen* 50, 2 (2013): 162–177. 00179841.00179841.
- John, Overton, and Warwick E. Murray. "Fictive Place." *Progress in Human Geography* 40, no. 6 (2016): 794–809. doi:10.1177/030913251562464.
- Klokk, Olav. "Oversigt over det norske landbruks utvikling siden 1750." In *[An Overview of the Development of the Norwegian Agriculture since 1750]*. Kristiania: Helge Erichsen, 1920.
- Kraft, Jens. *Topographiske-Statistiske Beskrivelse over Agerhuus Amt [A Description of Societal and Natural Conditions in the Agerhuus County]*. Christiania: Chr. Grøndahl, 1820.
- Lister, Diane L., and Martin K. Jones. "Is Naked Barley an Eastern or a Western Crop? the Combined Evidence of Archaeobotany and Genetics." *Vegetation History and Archaeobotany* 22, no. 5 (2013): 439–446. doi:10.1007/s00334-012-0376-9.
- Lunden, Kåre. "Frå Svartedauen Til 17.mai. Norsk Landbrukshistorie II [From the Black Death to the May 17th." *Norwegian Agricultural History, Part II], 1350-1814*. Oslo: Samlaget, 2002.
- McCaig, Robert, Ken Sawatzky, Alexander Egi, and Li. Yueshu. "Brewing with Canadian Hulled Barley Varieties, CDC Freedom, CDC McGwire, and CDC Gainer." *Journal of the American Society of Brewing Chemists* 64, no. 2 (2006): 118–123. doi:10.1094/ASBCJ-64-0118.
- Mitterpacher, Ludvig. *Elementi D'Agricoltura*. Introduction to Agriculture. Milano: Giuseppe Galeazzi, 1784.
- Nelson, Max. *The Barbarian's Beverage: A History of Beer in Ancient Europe*. Abingdon: Routledge, 2005.
- Nigusse, Bereket Tekle. "Barley Farming Systems and Types of Barley End Uses for Human Consumption as Describes by Farmers in Eritrea." In *Food Barley: Importance, Uses and Local Knowledge*, edited by Stefania Grando and Helena Gormez Macpherson, 36–41. Aleppo: ICARDA. International Centre for Agricultural Research in the Dry Areas), 2005.
- Nordland, Odd. *Beer and Brewing Traditions in Norway*. Oslo: Universitetsforlaget, 1969.
- Ødegaard, Nils. *Kristians amt 1814-1914*. Kristians County 1814-1914. Kristiania: Grøndahl & Søn boktrykkeri, 1918.
- Ødegaard, Nils. *Jordbrukslære*. Knowledge about Agriculture. Kristiania: Aschehoug & Co, 1924.
- Østberg, Kristian. *Norsk Bonderet*. Norwegian Agricultural Law. Kristiania: Johan E. Schoubyes Boktrykkeri, 1918.
- Patterson, Mark W., and Nancy Hoalst-Pullen. "Geographies of Beer." In *The Geography of Beer*, edited by Mark W. Patterson and Nancy Hoalst-Pullen, 1–5. New York: Springer, 2014.
- Petruzzelli, Antonio Messeni, and Tommaso Savino. "Search, Recombination, and Innovation: Lessons from Haute Cuisine." *Long Range Planning* 47, no. 4 (2014): 224–238. doi:10.1016/j.lrp.2012.09.001.
- Petruzzelli, Antonio Messeni, and Tommaso Savino. "Reinterpreting Tradition to Innovate: The Case of Italian Haute Cuisine." *Industry and Innovation* 22, no. 8 (2015): 677–702. doi:10.1080/13662716.2015.1122512.
- Pontoppidan, Eric. *Det Første Forsøg Paa Norges Naturlige Historie [The First Attempt to Describe the Natural History of Norway]*. København: Berlingske Arvingers Bogtryggeri, 1752.
- Ramus, Jonas. *Norriges Beskrivelse*. The Description of Norway. Kiøbenhavn: N.p, 1715.
- Schlegel, Joh, and Fredrik Wilhelm. *Statistisk Beskrivelse av de fornæmste europeiske stater*. Statistics of the most Important European Countries. Kiøbenhavn: Boghandler Mallings Forlag, 1793.

- Schnell, Steven M., and Joseph F. Reese. "Microbreweries, Place, and Identity in the United States." In *The Geography of Beer*, edited by Mark W. Patterson and Nancy Hoalst-Pullen, 167–187. New York: Springer, 2014.
- Shields-Argelès, Christy. "Tasting Comté Cheese, Returning to the Whole, the *Jury Terroir* as Ritual Practice." In *Making Taste Public: Ethnographies of Food and the Senses*, edited by Carole Counihan and Susanne Højlund, 83–96. London: Bloomsbury Academic, 2018.
- Sjøgren, Per, and Johan E. Arntzen. "Agricultural Practices in Arctic Norway during the First Millennium B.C." *Veg Hist Arehaeobot* 22, no. 1 (2013): 1–15. doi:10.1007/s00334-012-0346-2.
- Skappel, Simen. *Træk av Det Norske Agerbrugs Historie i tidsrummet 1660-1814 [Norwegian Agricultural History in the period 1660-1814]*. Kristiania: Grøndahl & Søns Bogtrykkeri, 1904.
- Solberg, Thorleif. "Tingbok for Ringerike, Bok 33: 1686 [Court Records from Ringerike, Box 33:1686]". Transcribed by Thorleif Solberg. Accessed April 30, 2018. <http://ringerike-slektshistorielag.com/images/Tingbok/1686.pdf>.
- Sommerfeldt, Christian. *Agerdyrknings-katekismus, Eller Grundregler for Et Retskaffent Jordbrug I Norge [The Catechism of Field Cultivation or Basic Rules for Correct Agriculture in Norway]*. Kiøbenhavn: R. Møller, 1779.
- Stika, Hans-Petter. "Traces of a Possible Celtic Brewery in Eberdingen-Hochdorf, Kreis Ludwigsburg, Southwest Germany." *Vegetation History and Archaeobotany* 5, no. 1–2 (1996): 81–88. doi:10.1007/BF00189437.
- Thunæus, Harald. *Ölets Historia I Sverige. I Från Äldsta Tider till 1600-talets Slut [The History of Beer in Sweden. Part 1. From Ancient Times to the End of the 17th Century]*. Stockholm: Almquist & Wiksell, 1968.
- Thunæus, Harald. *Ölets Historia I Sverige. II 1700- Och 1800-talen [The History of Beer in Sweden. Part II. The Eighteenth and Nineteenth Centuries]*. Stockholm: Almquist & Wiksell, 1970.
- Tore, Ey. *Vang Og Slidre [The Municipalities of Vang and Slidre]*. Kristiania: Nikolai Olsens Boktrykkeri, 1916.
- Tøsse, Sigvart. *Bygdebok for Tydal. Bind II. Bygdehistoria Ca. 1900-1991 [The History of Tydal Municipality. Part II. The History Ca. 1900-1991]*. Tydal: Tydal kommune, 1991.
- Trubek, Amy B. *The Taste of Place: A Culinary Journey into Terroir*. Berkeley: University of California Press, 2008.
- Unger, Richard W. *Beer in the Middle Ages and the Renaissance*. Philadelphia: University of Pennsylvania Press, 2004.
- Upreti, R. P. "Status of Food Barley in Nepal." in the Dry Areas). *Food Barley: Importance, Uses and Local Knowledge*. edited by Stefania Grando and Helena Gormez Macpherson. Aleppo: ICARDA (International Center for Agricultural Research, 2005. 99–114.
- Vevelstad, Andreas. *Aust-Agder Landbruksselskap gjennom 150 år [The Aust-Agder Society for Promotion of Agriculture, the last 150 years]*. Kristiansand: Fædrelandsvennens trykkeri, 1981.
- Vik, Knut. *Åker Og Engdyrking [Cultivation of Fields and Grass Land]*. Oslo: Aschehoug & Co, 1937.
- von Lövenskiold, and Bartholomæus Herman. *Beskrivelse over Bradsbjerg Amt Og Scheens Bye Med Fine Forsteder [Description of Bradsbjerg County and the Town of Skien Including Its Wealthier Suburbs]*. Christiana: Bogtrykker Bergs Forlag, 1784.
- Wedum, Gunhild *Retrovasjon: Innovasjon med utspring i tradisjon i matbransjen [Retrovation: Innovation Rooted in the History of Local Food Products]*. PhD Thesis. Lillehammer: Inland Norway University of Applied Sciences, 2019.
- Wikikilden. "Norges land og folk - Hedemarkens amt 1.djvu/874" [The History of Norway and its Population – Hedemarken County 1.djvu/874]. Accessed April 22, 2018. https://no.wikisource.org/wiki/Side:Norges_land_og_folk_-_Hedemarkens_amt_1.djvu/874.
- Wille, Hans Jacob. *Beskrivelse over Sillejords Præstegield i Øvre-Tellemarken i Norge*. Description of Sillijord Parish in the Upper-Telemark in Norway. Kiøbenhavn: Gyldendals forlag, 1786.

- Wilse, J.N. *Physisk, Oeconomisk Og Statistisk Beskrivelse over Spydeberg Præstegield Og Egn I Aggershuus-Stift I Norge [Description of Society and Nature as Well as Statistical Issues: Spydeberg Parish and Its Surroundings in Aggershuus-County Norway]*. Christiania: C.E. Schwch, 1779. Reprint, Fredrikshald: E.Sems Trykkeri, 1920.
- Yali, Li, Chunlin Long, Kenji Kato, Chunyan Yang, and Kazuhiro Sato. "Indigenous Knowledge and Traditional Conservation of Hulless Barley (*Hordeum Vulgare*) Hermplasm Resources in the Tibetan Communities of Shangri-la, Yunnan, SW China." *Genetic Resources and Crop Evolution* 58, no. 5 (2010): 645–655. doi:10.1007/s10722-010-9604-2.