



HÁSKÓLI ÍSLANDS

Hugvísindasvið

**The clay tobacco pipe collection from
Hólar, Iceland**

A case study

Ritgerð til MA-prófs í fornleifafræði

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1 Introduction

The following master's thesis will be dealing with the collection of tobacco clay pipes from the bishop's see at Hólar. Hólar itself is situated in the North-West of Iceland in the valley of Hjaltadalur. The seat of the bishopric was founded in 1106 and excavations were undertaken from 2002 until 2010. The excavations unearthed an extensive number of houses and structures ranging from the Viking age up to the 18th century. With a densely populated area a vast amount of finds came to light.

The author of this thesis has analysed all available clay tobacco pipes from this site and will present the first results below. In the beginning a brief history of the consumption of tobacco shall be given, followed by an overview of older and newer research with a closer focus on the clay pipe research done in Iceland up to this day. In chapter four the methods used for the analyses will be presented. Subsequently the first results will be shown and finally a conclusion will be drawn.

The aim of this thesis is to explore the potential of clay tobacco pipe analysis in Iceland. This is a case study and will be focusing on four themes: dating, origin, quality and usage. As clay pipes are commonly used for dating this will be the first theme to be scrutinised in chapter five. The provenance of pipe products will be interesting to explore as there are rather small scale production sites in Denmark which are found in the Hólar collection. Most of the Danish clay pipes were not as greatly traded in numbers as the ones from the well known centres of England and The Netherlands. A new angle for the clay pipe research will be introduced next. The issue of quality has been touched on in various publications but it was always more of a subjective approach. This thesis has defined four quality groups and will try to present some criteria tied to each group. In doing so, it should be possible to achieve statistical data and look at the results drawn from it. A closer look at use patterns will follow. The usage of clay tobacco pipes has been documented before but only in the form of a comment whenever some particularly dominant character was observed. In this case study, all clay pipes were looked at for the use patterns. The methods are described in chapter four while results follow in chapters five and six.

An appendix has been added to this work in form of a CD. It can be found in the back of this master's thesis including the complete clay tobacco pipe collection from Hólar to the present day. Almost all of the analyses are done by the author herself. This takes the form of an excel-sheet and is exported from the Intrasis database used for the Hólar site.

It should be mentioned at this point that the author of this thesis is new to the subject of clay tobacco pipe studies therefore it will not be surprising that mistakes might occur during the analyses. These errors, however, should not be a hindrance as the overall results still show the correct tendency.



Figure 1.1: Bowl fragment made of reddish clay. This fragment was defined as belonging to the best quality and it is unused (photo taken by A. Wacke).

2 History of tobacco consumption

The aim of this thesis is to focus on clay tobacco pipes which present only one way to consume tobacco. There are, however, other ways to take tobacco as well as a whole history about the use of tobacco. At this point there will be given only a brief overview about the topic.

Tobacco derives from plants like *Nicotiana rustica* and *Nicotiana tabacum*. The specific origins of these plants are lost. It is known, however, that they broadly came from South and North America. These plants were used early on in a dried form to be smoked by the native population of these continents.

Tobacco and smoking was introduced to Europe in the 16th century. The practice was observed among native tribes by explorers to the New World and other encounters with Amerindians in both Americas. After its introduction to Europe it spread rapidly across the whole continent and from Europe the habit spread to India, China, Africa, the Philippines, Japan and others. The tobacco plant first appeared at the Portuguese court in Lisbon in 1540. Already by 1570 tobacco was being grown on a small scale in Belgium, Spain, Italy, Switzerland and England¹.

The physicians at the time were excited by tobacco and saw it as a new medicinal plant. In the publication about plants and herbs by Nicolas Monardes in 1571 tobacco was said to cure more than twenty specific ailments and complaints². Furthermore it was observed to appease hunger and thirst. Monardes wrote about three different ways on how to use tobacco. The first was to use the fresh green leaves and ground them in their own juice to apply to wounds and use in other external ways. Secondly he recommended to mix tobacco leaves with lime to be chewed to reduce hunger and thirst. Lastly Monardes told about the use of dried leaves for smoking. Another way to consume tobacco was as snuff but this was only added later in 1668 by researchers. Soon tobacco was defined as the “herbal panacea” able to miraculously cure almost everything.

The French ambassador Jean Nicot working in Lisbon from 1559 to 1561 promoted tobacco as perfectly suited for the life at court. He also promoted the plant in his home country and soon tobacco was common in France. In England Sir Walter Raleigh was an

¹ Goodman 1993, p. 37.

² Goodman 1993, p. 45.

important figure in connection with the development of a smoking culture. He promoted openly smoking at the English court and even when in direct contact to Queen Elisabeth I. Under her protection smoking was soon a common social practice. But it was not until the 1570's that tobacco entered into common consumption patterns outside the Americas. From a primary use as medicine, tobacco eventually turned to become a more recreational pleasure. Statistics of tobacco imports show the rapid growth in demand (see table 2.1). To take England as an example, the import of only 25,000 pounds in 1603 had increased by 1700 to a total of about 38 million pounds of tobacco. This number shows that by the 18th century tobacco had become a commodity for mass consumption. In other words this statistic represents 25% of the adult population had enough tobacco for at least one pipeful per day³.

<i>Years</i>	<i>Annual consumption (lb per capita)</i>
1620-9	0.01
1630-1	0.02
1669	0.93
1672	1.10
1682, 1686-8	1.64
1693-9	2.21
1698-1702	2.30

Table 2.1: Table showing only the legal consumption of tobacco –not including smuggled and contraband tobacco (source: Goodman 1993, p. 60, table 4.1).

In the Netherlands the picture is similar: by 1670 around 3 million pounds of tobacco made mass-consumption possible a mere 30 years earlier than in England. This was also caused by the cheaper price of tobacco. It can therefore be said, that tobacco consumption was commonly spread through all the Dutch social classes from around the early 17th century. If all social classes were reached then it seems important to know which genders or age groups were smoking. On the basis of written sources as in eyewitness accounts from encounters with the New World as well as from paintings this question can be attempted to be answered. It should be mentioned, that prohibitions on tobacco consumption in connection to the users age are rather modern inventions and do not come into affect before the 19th century. In the light of this knowledge it is not surprising to find no gender restrictions: women were smoking just as much as men were. Furthermore there was no obvious difference within social classes other than maybe in the way tobacco was consumed, as in smoking, using snuff or chewing. Thus

³ Goodman 1993, pp. 59.-this number does not suggest that only adults were smoking at that time but represents the availability in common.

chewing tobacco was said to be connected to people working outdoors and sailors. Travellers to America, also reported on some occasions, that children, both boys and girls, of eight and ten years old were seen smoking.

The increase of tobacco imports, as well as the highly specialised mass production of clay pipes in various countries, suggests a change in the reasons why people smoked. In the beginning tobacco was legalised for its medical uses. But during the 17th century it had shifted to a more social and public act which could even be called recreational. This is mirrored for example by the appearance of smoking clubs and schools in England and France. On the other hand smoking could also be a private manner which was used for leisure as well as mentioned above as a medical treatment.

The consumption of tobacco was not, however, an unquestioned business. From the very beginning when tobacco was mainly used for medical treatment, critical voices questioned the “goodness” of tobacco. As an anonymous pamphlet titled *Work for Chimney-Sweepers: or, A Warning for Tobacconists* from 1602 argued tobacco was dangerous and not as efficacious as its promoters claimed⁴. This view is mirrored in many other publications afterwards. A strongly convinced non-smoker, King James I of England, published his views in the leaflet “*A Counterblaste to Tobacco*” and attempted stringent counter-measures to the smoking habits⁵.

After these discussions had subsided somewhat another debate started. Due to the then common and frequent use of tobacco in almost all social spheres the church became concerned. The question was if clergymen should be allowed to use tobacco during the services⁶. Another important point for the church was the definition of tobacco. If it was seen as a food then there would arise the need to attach rules to it. Since certain foods were not allowed to be consumed during the times of fasting and Lent. This ecclesiastical debate was settled in the 18th century. Many popes were addicted to tobacco by that time and finally the ordinance of Pope Benedict XIII from 1725 allowed officially the use of snuff in the church. The papacy even opened its own tobacco factory in 1779. With the final surrender of the church, tobacco consumption had finally succeeded spreading into all spheres of life.

Smoking clay pipes was the most common way to consume tobacco in the 17th century. With the clay tobacco pipe itself came the tobacco box, which is not to be confused

⁴ Goodman 1993, pp. 76-77.

⁵ Duco 1981, p. 371.

⁶ Goodman 1993, pp. 77-78.

with snuff boxes. In the tobacco box were all the essentials for the smoker, such as a flint, steel and ember tongues⁷. This habit seems to change in the 18th century and is also reflected in the decrease of pipe manufacturing. Even though the use of clay pipes decreased other means of consumption became fashionable like using snuff tobacco and much later smoking tobacco in the form of cigarettes. The triumphal procession of tobacco has not decreased up to this day, it only changes its face.



Figure 2.2: Bowl fragment of Dutch origin. The soot on the outside is clearly visible as well as the smoking stains at the base. These originate from tobacco juice and after an extensive use even penetrate the surface (see clear line at the base -photo taken by A. Wacke).

⁷ Goodman 1993, p. 66.

3 State of Research

Clay tobacco pipes are common finds on archaeological sites from the 16th century onwards. Therefore it is of no surprise to find fragments of this category in large quantities in almost all places that the European market at the time could reach. The special clay, a long lasting material which is often rather completely preserved in the ground, is easily identified as belonging to a tobacco clay pipe. Furthermore, the pipe fragments can show decoration and/or writing that help determine the origin of the fragment as well as presenting a date for its production. Clay tobacco pipes present a good tool to work with on archaeological excavations. This chapter will give a brief introduction about the very basics of the tobacco clay pipe, including its origin, various production methods as well as the dating potential and ideas about the trade in pipes.

As mentioned above, clay tobacco pipes were traded far and wide over the world. Therefore this chapter will continue with a short overview of the state of research in one of the European centres of production, The Netherlands and look at one of the receiving countries, America. At the end of this chapter I will turn my attention to the country that forms the main focus of this research: Iceland. I will aim to give a brief and general introduction to the history of tobacco and smoking in Iceland.

3.1 Clay tobacco pipes: origins and production methods

The origin of the first ever made clay tobacco pipes is rather uncertain. Although clay tobacco pipes are an invention of the European mainland, certain kinds of wooden smoking pipes are known to have been used earlier by various native Indians. It is likely, however, that the first stable production of clay tobacco pipes took place in England.

It was in the last quarter of the 16th century that the habit of smoking tobacco was brought to the European mainland⁸. According to Duco it is most likely that the knowledge of making clay pipes was introduced to The Netherlands by the English. He names three groups of English men that were in The Netherlands at the time and knew about smoking tobacco from home. One group were people fleeing from the persecution of King James I. Amongst this group were many craftsmen. Another group of English people were the ones leaving because of the deteriorating economic and social conditions in England. They rather wanted to participate in the emerging industrial activities in the larger cities in western Holland.

⁸ Duco 1981, pp. 371.

Finally there was the group of English soldiers sent by Queen Elizabeth I to help the Dutch against the Spanish occupation. But also part of the refugees mentioned above enlisted themselves into the armies of the Dutch stadtholders who fought against the Spanish. After these soldiers were not needed anymore they stayed in Holland but returned to their old professions and some of these craftsmen were tobacco-pipe makers. By around 1610 to 1620 Duco calls the established industry “reasonable-sized”⁹. A flourishing pipe industry in Holland, however, must have been firmly in place by around 1640 to equal the English production in numbers. From then on the main production area in The Netherlands was Gouda. But Amsterdam, Leiden and other cities also produced clay tobacco pipes on a large scale. In England the most important production areas were London and Bristol. It is, however, not that easy for the English production centres as there are more spread throughout the country which might have worked on a smaller scale yet the products can be found at various excavation sites in Europe and Scandinavia. There were other production centres outside the Netherlands and England as well. Relevant to the following discussion are especially the Danish pipes with production centres in Copenhagen, Stubbekøbing on the Falsther Island and in Nørre Sundby in Jutland¹⁰. The main production of clay tobacco pipes in Denmark began in the first quarter of the 18th century and ended around 1860.

More production centres of varying sizes and influence across Europe which are not of immediate concern in this thesis, will therefore just be mentioned at this point. Many workshops of pipe makers are found in different areas in Germany, as well as in France, Sweden, Poland, Belgium and others. After becoming a well established and developed industry there are even production sites to be found at some places in North America.

The making of a clay tobacco pipe followed rather similar steps both in England and on the European mainland (see figure 3.1).

But generally true for all the clay tobacco production sites is the fact that the whole process was done without machines or engines. Pipe workshops are commonly all manufactures from the 16th to the 19th century. Therefore the pipes are more or less unique copies even though a few are made from one mould but cannot be expected to look exactly the same. Even though the pipes from the same mould will be nearly identical, the finishing of the surface or the stamp might show slight differences. These differences are usually of such a small impact that this can be neglected in the analyses. There are, however, a few differences

⁹ Duco 1981, pp. 372.

¹⁰ Ahlefeldt-Laurvig 1980.

in the later stages of the production process between the English and Dutch pipes which shall be outlined here. In the beginning of production both methods went parallel.

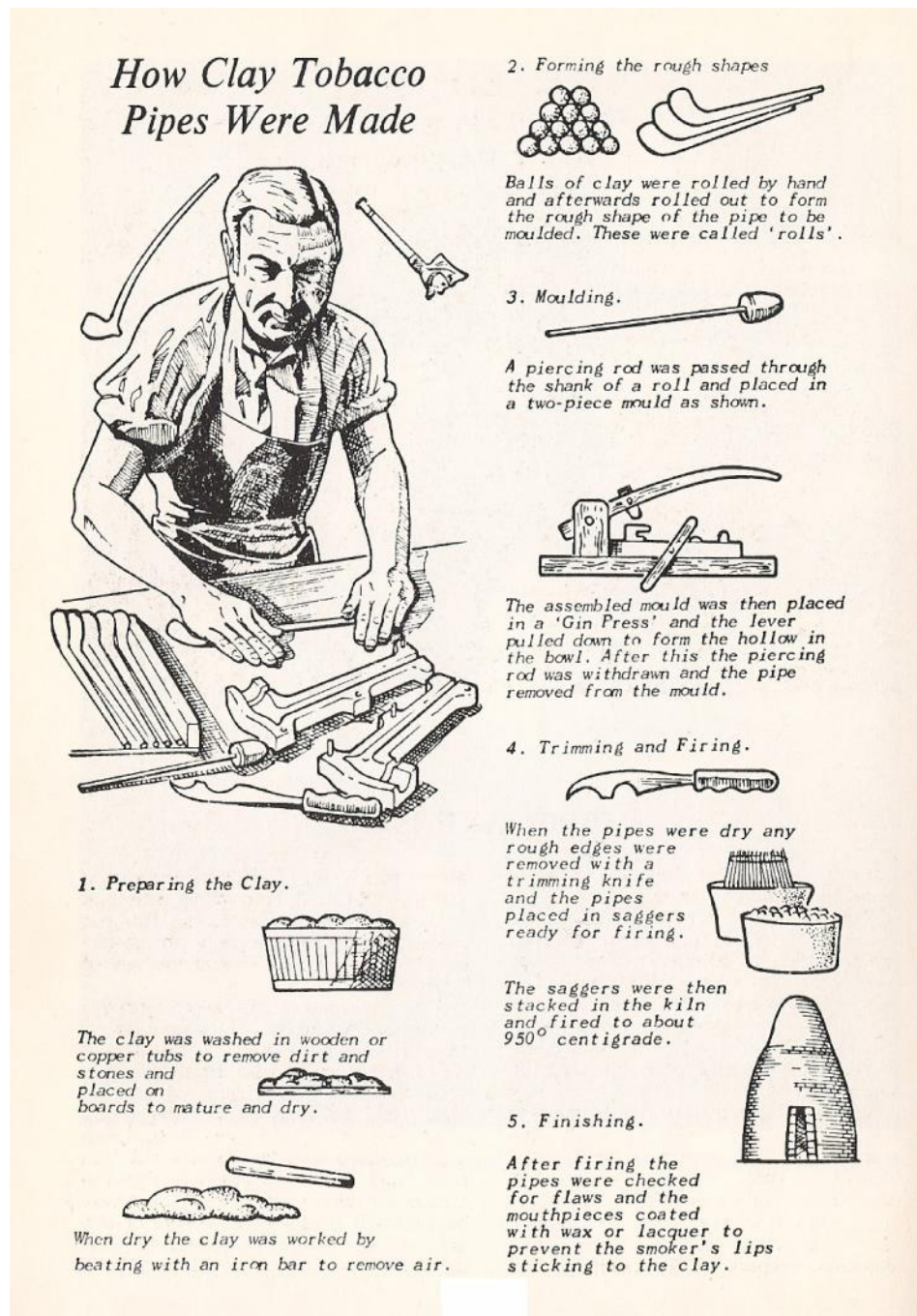


Figure 3.1: A simplified overview of the manufacturing process of clay tobacco pipes (source: Ayto 1990, p.12).

It all starts with the clay itself. For the tobacco clay pipes a fine and white-firing kaolin clay was used. The finer and cleaner the clay -the better the final pipe. These clays could be locally available or had to be imported. It is also possible that local and imported

clays were mixed¹¹. From there the production started. Firstly the clay needed to be prepared, large stones and other particles removed and then washed¹². When this had been done the clay was dried and left to mature for some time. Thereafter the clay was beaten with heavy metal bars to remove the air within and subsequently kneaded to a uniform mass. Then started the actual shaping process for which portions of clay were rolled into the rough shape of a pipe, called *rolls*, which were then left to dry for a short time. The moulder then would first pierce the stem with a brass or steel rod to make the bore hole and thereafter put the roll into one half of a two-piece mould. The earliest of these moulds could have been made of wood or brass, but the later ones were made of iron and decorations were already carved as negatives into them. The second half of the mould was positioned and so giving the *rolls* the shape of the clay pipe. The pipe, which was still in the mould, was then fixated and pressed in a *bench-vice* or *gin-press* (see figure 3.2) to ensure an even shape. As the bowl was still solid clay at this stage, there were two ways how to produce the cavity which would form the bowl to hold the tobacco later on. One way was to manually use a *hand-stopper* which looked like a bulb on a stick and was pushed down into the mould at the place where the bowl would be. The second way was even easier as a bulbous form was attached to the lower side of the lever of the *gin-press* which was right above the fixated mould. To form the bowl cavity one only had to pull down the lever of the *gin-press*. The gin-press was a special English development. After the bowl was formed, the metal rod mentioned above was inserted further, to pierce through the bowl and connect the stem with the bowl. When this was finished the *moulder* would trim the excessive clay of the joints of the mould and from the rim of the bowl and then remove the piercing rod to lay the pipe down to dry. The pipes were handed over to the *trimmers* who then took off any rough edges with specially shaped knives and later to the *finisher* who polished the more expensive pipes. When the pipes had passed the inspection for flaws and other errors they were placed into a kiln to fire. The firing process took around three days in which the temperature was very slowly brought to about 900°C and then carefully cooled down. The final touch up for the finished pipe was the treatment of the mouthpiece so that the smoker's lips would not stick to it. When all was done the completed pipes were put in wooden boxes with various kinds of protection like wood shavings or sawdust and sent to the customer.

¹¹ Duco 1981, p. 373.

¹² Ayto 1990, pp. 19-24.



Figure 3.2: A photo of a gin-press. One of the few machines used in the production of pipes (source: Ayto, 1990, p. 22.).

To date or specify the origin of a clay pipe fragment, the main form and appearance of the bowl and stem can give indications. Pipes mainly follow a chronological development which differs from country to country which will be roughly outlined here. When the production of clay tobacco pipes began in The Netherlands the first results were rather shapeless. A double-conical bowl and very short and thick stems are typical for those made in the 1620's. The main change occurs around the middle of the 17th century when Dutch pipes show an increase in bowl size¹³. This change could be due to two main reasons. Firstly the price of tobacco became cheaper since England and Holland planted their own tobacco plants and did not need to rely on expensive imports from America. Secondly the tobacco was less strong and therefore the smoker needed a larger quantity in the pipe. After the middle of the 17th century the Dutch pipe bowl became much more slender and elegant, while the stem became longer. Therefore less clay was needed for making these latter pipes, which indicates an increase in workmanship and might point to a shortage of raw material at some point in time. The length of the stem, however, can also underlie the preferences of the smoker since

¹³ Duco 1981, p. 373.

there are extremely long stems in later times which can reach up to around 40cm¹⁴. It should be noted here that these stems are rather unusual as well as rare and made on request.

As time and fashion moved on, various patterns for decoration on both stem and/or bowl were added. It is important to mention here, that there are technical differences in the application of decoration. Firstly there are negative decorations like the milling around the rim of the bowls or bands around the stem. These are impressed into the dumb clay with the help of stamps. Another possibility is that the patterns were carved into the moulds and appear on the pipe in relief. Also an improvement in craftsmanship concerns the surface treatment: whether the pipes were only trimmed or polished as well. The polish itself could occur in various degrees of elaborateness. All of these different treatments could occur in combination and in doing so changed the quality and with that the price of the pipes. In the Dutch production style there are various quality levels known from documented sources: the '*groffe*' or rough pipe, the '*fijne*' or fine pipe and lastly the '*porceleine*' or porcelain pipe. Within these pipe types there occur further sub-variations. The specific problem about identifying different quality levels from archaeological specimens will be discussed in the methods chapter four.

Similar observations about chronological and technical development apply to English products which show a rather equally shapeless beginning in the design of the bowl and stem. The bowls also increase in size but are usually more rounded than the Dutch products.

One problem with the outer appearance as a dating aid, however, is the life span of the mould itself. Iron moulds have a rather long life which means that older styles will overlap with younger ones. Clay, anyway, has an abrasive character and therefore the mould would suffer over time which is mirrored in larger bowls and stems as well as in less defined details in the decoration from the latter products made from one specific mould. Whether this was taken into account by assigning the value or quality category to the pipe is uncertain. Duco suggests that up to 2,000 pipes could be made of a single mould¹⁵.

¹⁴ Duco 1981, p. 375.

¹⁵ Duco 1981, p. 379.

3.2 Research Issues

Due to the high numbers of pipe fragments from excavations, clay pipes were mainly used to find a date or time span for the site. As a tool for dating, tobacco pipes started to be studied in the 1950's both in Europe and in America.

3.2.1 Clay pipes used for chronology

In America the first scientific studies on clay pipes were done by J. C. Harrington in 1954¹⁶. His well known article used the fragments of pipes that are highest in numbers and mainly undecorated which are stem fragments. Harrington wanted to find a way to date these otherwise rather indeterminable stem fragments. For his research he used only tobacco pipes of English origin. He recognised that the bore diameter seemed to shrink over time. With the help of bore drills, which ranged in size and are easily inserted into the stem, he observed a decrease in the diameter by 1/64th of an inch as time progressed. Therefore he formulated time intervals which range between 30 to 50 years. In his mind, this observation was due to different wires used by the pipe makers to make the bore at various times. In doing so Harrington recorded a relationship between the bore diameters of the stems and time which was visualised in a histogram (see figure 3.3). The result was visible in five time periods. There are, however, some problems with this method. The first are the variations within the set time periods as well as the rather large time spans. Also the stems from before 1620 and after 1800 did not fit into his dating method. Another important drawback is the amount of fragments needed to do the test. Harrington himself used a total of 330 stem fragments but believed that 66 pipe stems would also suffice. However, this method cannot be used dating single stem fragments but merely groups of such, nor does it seem likely to work with fragments that have a long time span. These fragments would mix up the statistics.

¹⁶ Harrington 1954.

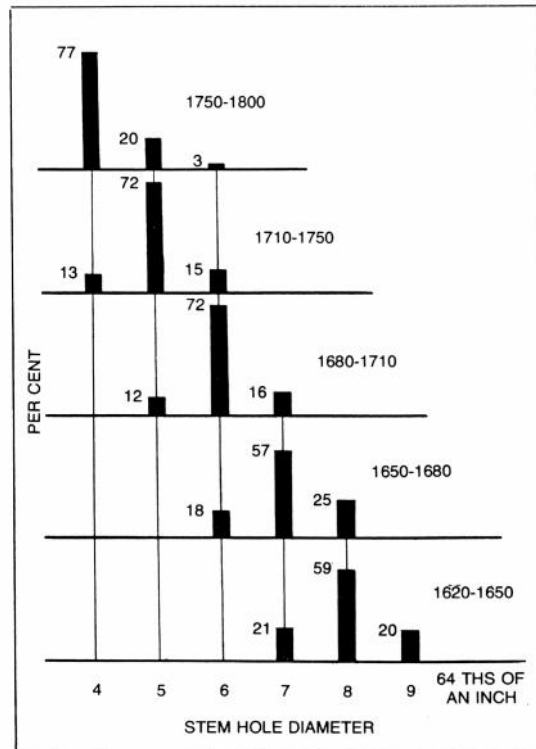


Figure 3.3: Histogram after Harrington. (source: Mallios, 2005, p. 90, fig. 1.).

After Harrington's breakthrough theory to use indeterminable stem fragments his method was improved by later archaeologists. Only eight years after publishing his ideas it was heavily criticised and corrected by Lewis Binford¹⁷. He was uneasy with the long 30 to 50 years time span that Harrington had laid out. Binford did not trust the fact that the dates of archaeological samples corresponded so clearly with Harrington's set intervals. He therefore calculated a straight-line regression formula based on chronology and mean bore-diameter size¹⁸. The formula results in a mean date instead of given time intervals and goes as followed:

$$Y = 1931.85 - 38.26X$$

Y represents the estimated date while X is the pipe assemblage's average bore-diameter measurement. The value 1931.85 derives from the regression curve that Binford fitted to Harrington's data, and assumes a straight line or constant reduction. But Binford's method has limitations as well which he identified. All of which coincide with the limitations to Harrington's approach. Firstly a chosen sample of pipes needed to have an adequate amount of

¹⁷ Binford 1962.

¹⁸ Mallios 2005, p. 91.

fragments. The second limitation is that the sample needed to date before 1780. The third remaining limitation is that the sample should be random, representative and was deposited over time at an even rate¹⁹.

When Binford's revised formula was used by other archaeologists they recognised further problems with the accuracy of their results. One of the main problems is that it does not work well with groups before 1670 and after 1760²⁰, which presents not just a minor difference to Harrington's original premise but actually a deterioration of said original model. The formula again, therefore, had to be developed and modified to be used as a dating tool.

This was done in a first attempt by Hanson in 1969²¹. He insisted on a nonlinear relationship between time and bore diameter. He proposed ten formulas for various date ranges²². In an effort to prove Hanson's theory to be right other scientists improved the formula for a second time. Therefore in 1971 Heighton and Deagan developed a general logarithmic equation on the basis of pipe stems found at different sites in North America. Their new formula consisted of two parts²³.

The simplified combination from Harrington and Binford can still be found in an overview book about how to work with different artefacts published in America only in 2003²⁴. It still encourages the use of the method by saying "However, it is the pipe stem, or bore diameter of the pipe stem to be more precise, that can be quantified and plugged into a formula that yields a rough date for the pipe stem assemblage"²⁵.

But other archaeologists started to question the entire theory of changing bore diameter as a guide to chronology and its usefulness. Noël Hume in his book from 1969²⁶ is already unhappy with the imprecision of the dates.

Yet the idea to date pipes through mathematical formulas had not quite left the table in the North American research tradition. As with bores, the method for calculating dates only works with clay pipes of English origin and comes from the American research tradition. In 2005 Mallios showed the potential of a new calculation. This time it was not the pipe stem fragments that were used but the bowls to generate a mean date. Mallios' calculation consists

¹⁹ Binford 1962, p. 21.

²⁰ Mallios 2005, p. 91.

²¹ Hanson 1969.

²² To see the 10 formulas also check Mallios 2005, p. 91.

²³ To see the two part equation see Mallios 2005, p. 91.

²⁴ Ewen 2003, pp. 100-101.

²⁵ Ewen 2003, p. 100.

²⁶ Noël Hume 1969, pp. 296-313.

of four steps: (1) the pipe bowls need to be identified by the typology from Atkinson and Oswald²⁷. When this has been successfully done (2) the existing bowls from each form in the typology need to be counted. The counted amount of bowls then (3) need to be multiplied by the midpoint year of each typological range. Lastly (4) these midpoints need to be summed up and then divided by the total number of measurable bowls in the sample. The outcome is the mean date of the pipe bowl. Mallios tested his formula on three different sites. The results were sufficiently convincing and he appealed to other archaeologists to try his method. Nevertheless he recognises drawbacks in his theory. The usefulness of this method will have to be seen in the future also as only English products can be used.

Concerning the commonly used and long improved Harrington-Binford method by American researchers, one of the European colleagues answers it boldly: “[...] measuring the stem bore is useless”²⁸. This is due to the production process (see above). The metal rod which was used to pierce the stem and make the bore diameter could have a different diameter from one maker to another as there were no standardisations for the metal rods used. Also the metal rods could have a long life span and therefore have been used on overlapping clay pipe fashions. Furthermore, the composition of the clay could vary from site to site and therefore some clays might shrink (more) during the firing process than others. It has to be said here, however, that the white-burning kaolin clay used for tobacco pipes does not have a high shrinking rate during the firing process. Obviously these attributes could not be counted as indicators for dating the stems.

This conclusion seems to be the dominant opinion on the European mainland. In comparison to the American research traditions, European scholars have been focusing on typological features and their developments as well as identifying makers' marks with the help of documentary sources. This will be demonstrated in the following paragraph. It must be said at this point, that there are also catalogues for English makers' marks as well as typologies²⁹. The only drawback here are the widespread and rather smaller production centres in England for which a full catalogue do not exist, in comparison with the ones for Gouda, but each site is rather well studied and published.

²⁷ Atkinson/Oswald 1969. See also Mallios 2005, pp. 93.

²⁸ Duco 1981, p. 387.

²⁹ Oswald 1951; <http://archive.museumoflondon.org.uk/claypipes/index.asp>

3.2.2 Clay pipes in typology

There are no calculations on bore diameters made by European archaeologists. However, the history of research in Europe starts off analogous to the American one. Clay tobacco pipes were also used as a dating tool. The scientific work on pipes began only shortly before Harrington's method in the first half of the 1950's. Adrian Oswald began to work on English clay pipes by emphasising the changes and developments of the bowls. Thereby he recognised the obvious changes in the size, shape and decoration of the bowls. He did not come up with calculations but his research ended in one of the first typologies of pipes bowls in a chronological order in 1951 (see figure 3.4). Later, in cooperation with Atkinson they even developed this typology further³⁰.

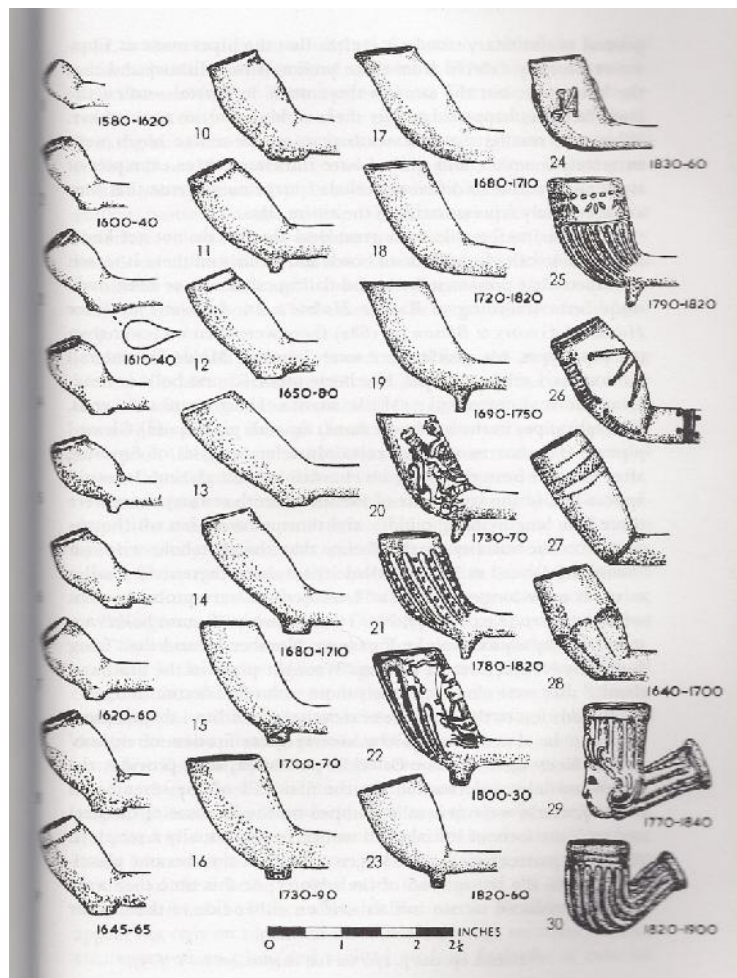


Figure 3.4: One example of a simplified typology with English pipe bowls. (source: Noël Hume 1969, p. 303.).

For Dutch products one of the most important researchers is the earlier mentioned Don Duco. He was the first one to publish a complete catalogue with all the makers' marks known

³⁰ Atkinson/Oswald 1969.

to him from the production centre at Gouda, The Netherlands, and their span of use in 1982³¹. He separated the marks into categories according to what they showed: figures (including symbols, coat of arms, objects, animals, human figures etc), letters and numbers. Duco was able to give a time span of use for all the marks but was not able to determine all the names of the pipe makers that used them. This seeming lack, however, was filled by van der Meulen in his catalogue from 2003³². Van der Meulen was able to attach more pipe makers' names to the dates and also added some more marks. In doing so he was able to break down the usage of various stamps into even shorter time periods allowing the researcher to give an even more precise date, sometimes within five to ten years. Most appealing it seems is the possibility to actually put a name to the found clay pipe. Unfortunately, these two catalogues can only be used on pipes made in Gouda. However, Gouda was the main production centre at the time and is very well documented with historical accounts and research as well as its products being found far and wide around the world.

Duco, furthermore, is the first one to publish a handbook about the Dutch clay tobacco pipe³³ which is still a must-have and also gives a basic introduction into the subject. Nevertheless Duco wrote many articles concerning clay tobacco pipe products from various Dutch regions like Amsterdam, Groningen, Haarlem and others. One of his more recent articles deals with problems of dating and identifying clay pipes across Europe³⁴. In a four-step-system Duco introduces a helpful way to deal with pipe collections of various origins. He explains features to (1) define the original Gouda style, (2) the Gouda imitation, (3) the local style and lastly (4) the influences from other centres of production. In doing so he opens the research to a wider audience and also hints at the great influences in importing Dutch products all over Europe.

It seems common for The Netherlands, as well as England, to make a combination of form and marks. The developed typologies go along similar lines like the one by Oswald. Pipe bowls are the main focus in the study which shows all the types and their chronological order. At the end of his catalogue he added a very short and simplified typology (see figure 3.5). Meulen, who refined the catalogue of makers' marks showed and discussed another more developed typology of Gouda pipes.

³¹ Duco 1982.

³² Van der Meulen 2003.

³³ Duco 1987.

³⁴ Duco 1998.

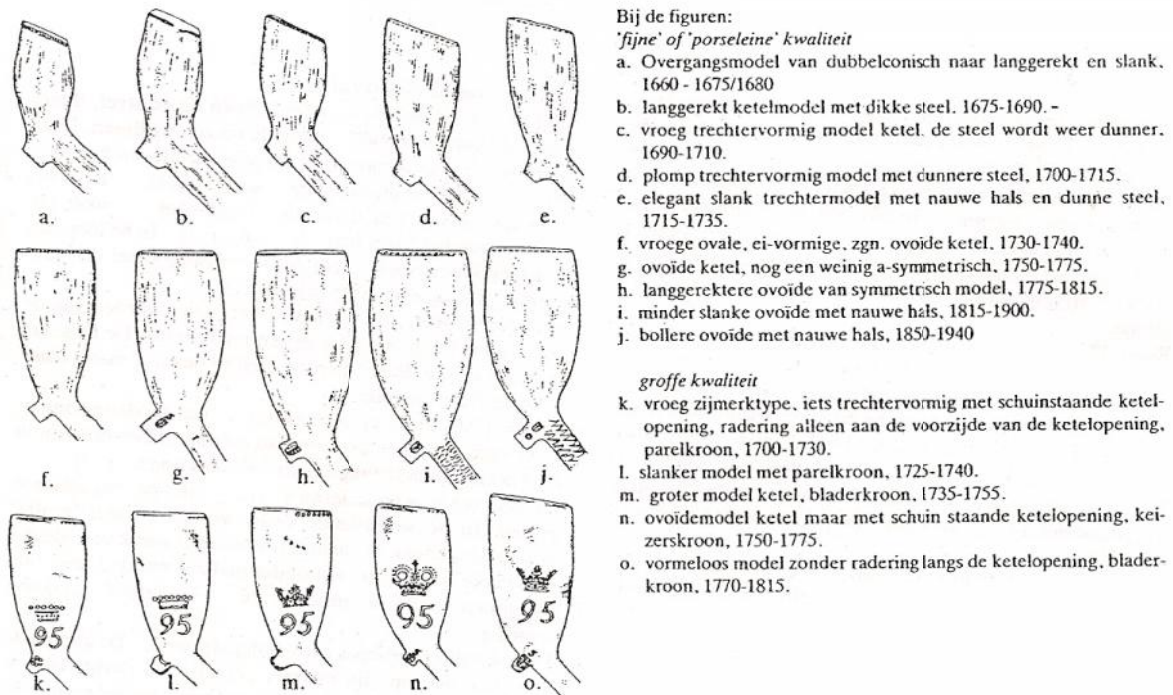


Figure 3.5: Simplified typology from the Dutch clay pipes. On the right side the differences in quality with “fine and porcelain” types as well as the “grotte” are listed as well as the dates for each bowl. (source: Duco, 1982, p. 111).

The main emphasis in Europe is on the one hand the dating of the pipe, which in a wider spectrum can give a *terminus post quem* for the archaeological site. On the other hand it seems to be important to know the place of origin as it indicates trade links. It is very typical for European archaeologists to develop and refine typologies. It is the ultimate tool in material studies in the history of archaeology.

3.2.3 Social approaches to clay pipes

As the attempts described above, the capture dates in mathematical formulas and typologies was one of the first ways to unlock information from clay tobacco pipes. Later researchers changed tack and started to connect clay tobacco pipes to social and political contexts. Nowadays these approaches are manifold and reach into all possible areas. Following in this paragraph are good examples which should illuminate just a few of the new research tendencies starting with political and socio-cultural changes.

The question of who is smoking and where, is touched in a study on the socioeconomic changes done by Fox in 2002³⁵. By looking at the clay pipe finds from Jamaica and the supplying homeland England she connected the use of clay pipes to changes in lifestyle. Coffeehouses emerged in the second half of the 17th century and smoking became a social event in the said houses as well as taverns³⁶. Looking also at the shipping lists Fox was able to deduce that clay tobacco pipes were affordable to all social classes. Clay pipes seem to her to be one of the first mass-produced articles that were in use only for a short time and then discarded³⁷.

In another article from 2009, Mehler summarises her PhD thesis on clay pipes in Bavaria³⁸. This is the first large-scale research on clay pipes in Germany and Mehler barely falls short of 9,500 clay pipe fragments. This vast amount of clay pipes was collected from present-day Bavaria and adjacent Austrian territories which were ones closely connected politically to Bavaria³⁹. After solving the problem of classifying the vast amount of clay pipes she is able to present results on the change of socio-cultural and political changes and is able to enlighten the Bavarian economic system of the 18th century. The clay pipes in Mehler's study are local Bavarian products and date between 1600 and 1745. Due to written sources it is known that a tax on tobacco was introduced in 1669 followed in 1675 by the tobacco monopoly which lasted until 1745. In this way the authority of Bavaria was profiting from the extended tobacco consumption and clay pipes became an instrument of control. The clay pipes had to be manufactured in Bavaria and only licensed makers were allowed to produce them. All pipes had to be labelled with the marks of the monopoly which consisted of two or more letters⁴⁰. The same was true for the crates and wrapping of tobacco. The monopoly was enforced by a special mounted police squad which was established in 1677⁴¹. It was their task to inspect smokers, carriages, market places and pipe salesmen. All unmarked products were confiscated and a fine was imposed.

Due to the political geography of Bavaria in the 18th century the tobacco and pipe monopoly was almost impossible to enforce. For one thing the special police squad consisted

³⁵ Fox 2002.

³⁶ Fox 2002, p. 69.

³⁷ Fox 2002, p. 75.

³⁸ Mehler mercantilism 2009.

³⁹ Mehler mercantilism 2009, p. 261.

⁴⁰ Mehler mercantilism 2009, p. 271.

⁴¹ Mehler mercantilism 2009, p. 274.

of only 40 men responsible for a large country and difficult topography⁴². This opened the door for a flourishing smuggling market of tobacco and clay pipes from outside this realm.

Another branch to connect clay tobacco pipes with political developments is the study on patriotism done by Paul Recker in 2001. He is studying “The Five Points”, a 19th century slum in New York. An overwhelming number of immigrants lived in this slum coming from different countries in Europe. The slum was a bustling commercial district with saloons and oyster houses. The 19th century America is marked by emerging social issues such as class conflicts, xenophobia and the discussion about the nature and character of the American national identity⁴³. In this ideological dialogue symbols and motifs were used to negotiate patriotism. Recker is particularly interested in the American patriotic motifs on the clay tobacco pipes and how they are distributed across several site features in the slum. In America clay pipes in the 1850’s and later are common for lower social classes such as day labourer and workingmen⁴⁴. They are the symbol for the working class and together with tobacco play an important role in the male orientated saloon culture of the time. Recker looks at three different clay pipe assemblages found in the slum. The first clay pipes come from a brick cistern which was surrounded by tenant families generally of German birth. The collection of clay pipes found shows 20% with American patriotic symbols like the Federal eagle. The second clay pipe assemblage was unearthed in a large cesspool and yielded a different data set. Here a mere 6% of all the pipes found show nationalistic theme. Of these the American motifs are predominant. Only one clay pipe with a typical Irish motif was found here. In 1855 97% of the residents around the cesspool were recent Irish immigrants which had resided in the U.S. for less than five years. The social issues that emerged included the exclusionary rhetoric and symbolism marshalled against the Irish immigrants which therefore were perceived by the Americans as a major threat to the established social order⁴⁵. “The hesitancy of the Irish [...] to use objects decorated with American patriotic motifs is more comprehensible when we can see their neighbours raising the American flag against them”⁴⁶.

The final assemblage Recker presents, dates past 1880 and has 23% of clay pipes which display clear Irish slogans. Recker concludes: “these meaningful changes in expression of identity and ideology through material culture both reflect and instigated further

⁴² Mehler mercantilism 2009, p. 276.

⁴³ Recker 2001, p. 214.

⁴⁴ Recker 2001, p. 216.

⁴⁵ Recker 2001, p. 220.

⁴⁶ Recker 2001, p. 222.

transformations in the Irish-American community itself, and in its relationship to American society in general”⁴⁷.

The importance for the European researcher to know from where the pipes came from is even more understandable since there are many production sites and workshops all over Europe, as mentioned above. And due to the fact that Gouda offers a richly documented past the idea of different quality types and monetary values are also touched on in the publications. A closer look into the subject of quality leads to interpretations about social status and class. The questions are: who can afford which type of clay pipe? And are there visible patterns in the distribution quality categories to be found on archaeological sites?⁴⁸

This is one idea taken up by Loktu in 2009⁴⁹. Her article about three different sites in Trondheim deals with several social identities, like traders, captains and wealthy men, which are revealed in various ways through tobacco consumption. She furthermore analyses the habit of smoking which gives indications of certain social preferences as to what is consumed in some of the sites⁵⁰. She critiques the lack of any theory around clay tobacco pipes and their isolation as mere artefacts. Loktu therefore introduces the concepts of *habitus*⁵¹ and *mimicry*⁵² to allow the pipes to be connected to social contexts. In doing so, she is able to show in her three case studies of different sites in Trondheim the various ways of tobacco consumption. At so-called *Folkebibliotekstomta* she found mainly a trade society with wealthy citizens such as landowners, mayors and presidents. Here the consumption of tobacco was a communal one, rather than a private practice. The second site, *Søndre Gate 4*, was a tavern run by a widowed woman. Here the way of tobacco consumption was communal as well and more in the form of recreation⁵³. Lastly the Archbishop’s Palace where most pipes were found in one room. Loktu concludes that this indicates a semi-social act of tobacco consumption. The room was identified as having been used by servants and soldiers of the feudal overlord for eating, relaxing and socialising. Since it is not open to all the citizens but also does not show the private, personal experience of tobacco consumption it can be seen as a semi-social act. Loktu also touches briefly on the connection between women and tobacco. From written accounts about the tavern she says that it was run by a widow, Anna Christensdatter. From there it seems a logical step to look at women and smoking. In an experiment done by American

⁴⁷ Recker 2001, p. 222.

⁴⁸ Duco 1998, p. 9.

⁴⁹ Loktu 2009

⁵⁰ Loktu 2009, p. 166.

⁵¹ Loktu 2009, pp. 157-158.

⁵² Loktu 2009, p. 160.

⁵³ Loktu 2009, p. 165; see also Goodman 1993, pp. 66-67.

scholars DNA was retrieved from a pipe stem found in Virginia City⁵⁴. The fragment comes from a 19th century complex identified as a saloon. The result from the DNA test suggests that a woman smoked this pipe⁵⁵. Another gender analysis concerning woman in connection with smoking tobacco was briefly researched by Articus in 2004⁵⁶. He goes back to written sources from the 17th and 18th century as well as visual sources in the form of woodcuttings and paintings (see figure 3.6). In his article he is able to show that different women of several social classes were drawn to smoking tobacco clay pipes. For Germany particularly Articus is able prove that in the 17th century women from lower social classes, marginal groups and women from a rural background are most commonly found smoking clay pipes⁵⁷. Furthermore he mentions similar circumstances known from Northern Germany, Holland, Sweden, France and England. The picture for noblewomen is diverse depending on the royal suite⁵⁸. It is known, however, that the daughters of the French king Ludwig XIV (1638-1715) were smoking clay pipes⁵⁹.

All in all the interest of recent research ranges from political and economic facts to gender issues and questions about social class, ethnic identification and other interesting areas. Future work will surely discover even more connections between the clay tobacco pipes and various social subjects.



Figure 3.6: A woodcut showing a couple smoking (source: Articus, 2004, p.13, fig. 1).

⁵⁴ Loktu 2009, p. 166 (quoting Dixon, K.J. (2006), Saloons in the Wild West and taverns in Mesopotamia: Explorations along the timeline of public drinking. In: Archer, S.N./Bartoy, K.M. (eds): Between dirt and discussion. Methods, methodology and interpretation in historical archaeology.

⁵⁵ Loktu 2009, p. 166.

⁵⁶ Articus 2004, pp. 13-19.

⁵⁷ Articus 2004, p.14.

⁵⁸ Articus 2004, p.19.

⁵⁹ Articus 2004, p.17.

3.2.4 Reused clay tobacco pipes

An interesting issue that both the American as well as the European scholars looked into is the reuse of either pipe fragments, worn out pipes or waste products. Given the many years of clay tobacco pipe study as well as the numerous finds of pipes known, it is of no surprise to find some remarkable objects amidst the collections. One of the most common reuses seems to be of stem fragments. In some cases, after the clay tobacco pipe was discarded or broken, the stem was separated from the bowl and a different number of holes were drilled in a line. This new artefact could be used as a penny-whistle⁶⁰. Such examples of whistles made out of clay pipe stems are found in both Europe and North America. To illustrate the point there are the whistles from *Helgeandsholmen* in Stockholm, Sweden (see figure 3.7). Here pipe stems from the 17th century were used and two or three holes were added in accordance to make them into musical instruments.



Figure 3.7: Musical instruments found in Helgeandsholmen, Stockholm. To the right in the foreground are two whitish penny-whistles made from clay tobacco pipe stems (source: Dahlbäck (edt.), 1982, p. 250, plate 36).

Other extraordinary uses are also documented. Clay tobacco pipes could be used as an instrument for beauty: stem fragments were heated up and used to curl hair. Specially manufactured wig curlers have been made of the same kaolin clay but are slightly differently shaped from the stems of the pipes⁶¹. The originally fashioned curlers are thicker and rather bulbous at the top and bottom while the middle was thinner. The stems of clay pipes could still be used as wig or hair curlers later on which might be shown by the slight carving of the

⁶⁰ Walker 1976, p. 124.

⁶¹ Noël Hume 1969, pp. 321-323; see figure 100 for the wig curlers on page 322.

surface in the centre of the stem. But even without visible traces of carving part of the surface off, it is possible that stem fragments have been used as such.

Another way to apply tobacco pipes for beauty was to ground part of the clay pipe to use the powder for whitening the teeth⁶². This ground powder is also said to take grease stains out of cloths if applied when hot.

Another exceptional use for clay pipe fragments is as ballast in ships⁶³. While other objects would have sufficed it is interesting to know that clay pipes were included in the ballast. Other clay pipe fragments are recorded amongst other materials as paving material on a walkway⁶⁴ in Colonial Williamsburg.

In the 20th century it is known, that clay pipes have been used as shooting gallery targets at carnivals, fairs and the like⁶⁵. Another way of amusement with former tobacco pipes was bubble blowing. There are even more uses known, but since none of them are of concern for this thesis they shall not be discussed further.

The state of research, though different in detail, undergoes a similar development in both Europe and America. In the very beginning the main emphasis seemed to establish vast collections of numerous clay pipe samples. In doing so clay tobacco pipes were seen as mere artefacts, helpful while finding a date for the excavated site and maybe first trade patterns. The research traditions vary in so far as American researchers especially focused on data measurements from the pipes. This had its climax in the processual movement in the 1960's and 1970's and produced various formulas and calculations for many fields in archaeology. The European research emphasised a form-based development and typology with the aim of refining older versions. Nevertheless both ways were clearly concerned to use clay tobacco pipes as dating tools.

This over-specialisation with pipes as dating tools was the only use in which clay pipes were put to for a long time. An interest in clay pipes as indicators of tobacco consumptions and how this related to the social context came at a later point. Only now research has turned to more contextual and social historical approaches to place the clay tobacco pipes back into "people's hands" and lives (see figure 3.8).

⁶² Walker 1976, p. 125.

⁶³ Sudbury 1978, p. 105.

⁶⁴ Sudbury 1978, p. 105.

⁶⁵ Sudbury 1978, p. 105.

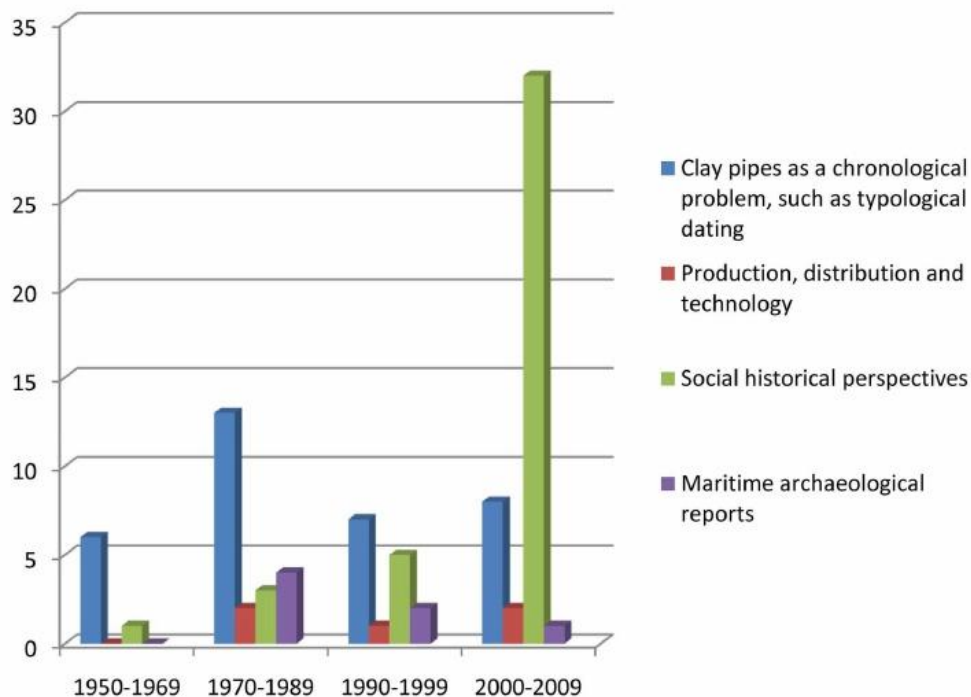


Figure 3.8: A bar chart of the change in research emphasis over time (source: Loktu, 2009, p. 159, fig. 2).

3.2.4 State of Research on clay pipes in Iceland

Clay pipe research in Iceland has not received much attention so far. Even though clay tobacco pipes are found frequently in post-medieval excavations, the fragments so far have been put to a very limited use. Reports from various sites, like the excavations in Viðey from 1987 to 1989 and Bessastaðir, name and catalogue clay pipes but mainly leave it at that. Pipes are a preferred tool for dating the sites.

For Viðey the attempt was made to use the Harrington-Binford method as well as working with various typologies. The expert on site for the clay pipes was a scholar from North America, Ned Heite. Due to the easily accessible and usable catalogues from Duco and Oswald, the only other aspect referenced next to dating is the origin of the pipe. Viðey is a large collection with more than 1,000 clay pipe fragments⁶⁶. According to Hallgrímsdóttir that presents an uncommonly large amount. She furthermore states that clay pipes were not bought as easily or cheap as in other places. Lastly she mentions that light repairs have been done on many clay pipes of her assemblage⁶⁷. Unfortunately no further descriptions or drawings are shown at this point. Hallgrímsdóttir finally raises an interesting point looking at the length of

⁶⁶ Hallgrímsdóttir 1993, p.133.

⁶⁷ Hallgrímsdóttir 1993, p.134.

the stems. She claims that most of the Viðey pipes are uncommonly short. This is due to the fragile nature of the clay pipes which broke while being brought to Iceland. She draws the conclusion that these clay pipes were purchased on a special discount price⁶⁸. After raising this intriguing issue she merely ends with dating the cultural layers in which they were found and nothing more seems to be said about the implications of the discovery before.

The recently published farm of Reykholt in the West of Iceland has a total of 100 clay pipe fragments⁶⁹. Reykholt was a farm of high status. The assemblage here has been used foremost for dating the archaeological contexts and the catalogue mentions the provenance where possible.

Skálholt, yet another important site with an even larger number of clay tobacco pipes than Hólar has yet to be fully analysed. The seat of the Bishopric in the south of Iceland has a formidable collection of clay pipes and is in the process of being analysed by the author of this thesis. A helpful start is the Bachelor of Arts degree (BA) by Margrét Valmundsdóttir submitted in 2008. It shows graphically the numerous clay tobacco pipes from the site. It is, however, a study on the distribution of various artefacts in Skálholt rather than a study of clay pipes per se (see figure 3.9).



Figure 3.9: Overview of artefacts and their statistical distribution. The colour-coded index at the right side shows finds like whetstones, iron, nails, textiles and others. The last item in the list named *tóbakspípa* are the clay tobacco pipes (colour-coded in dark blue) (source: Valmundsdóttir 2008, p. 20 fig. 2).

⁶⁸ Hallgrímsdóttir 1993, p.135.

⁶⁹ Sveinbjarnardóttir 2012.

Clay tobacco pipes are included in this study but were not the main focus since the work was concerned with GIS methods. Valmundsdóttir, however, was able to show that in some rooms there are almost no clay pipes to be found while the library (room 1200) and one of the dormitories (room 733) a high concentration is clearly visible in her colour coded map (see figure 3.10). Until now, no further attempts by other scholars have been made to analyse the material more closely and to use her results for new interpretations or to connect the findings with social aspects.

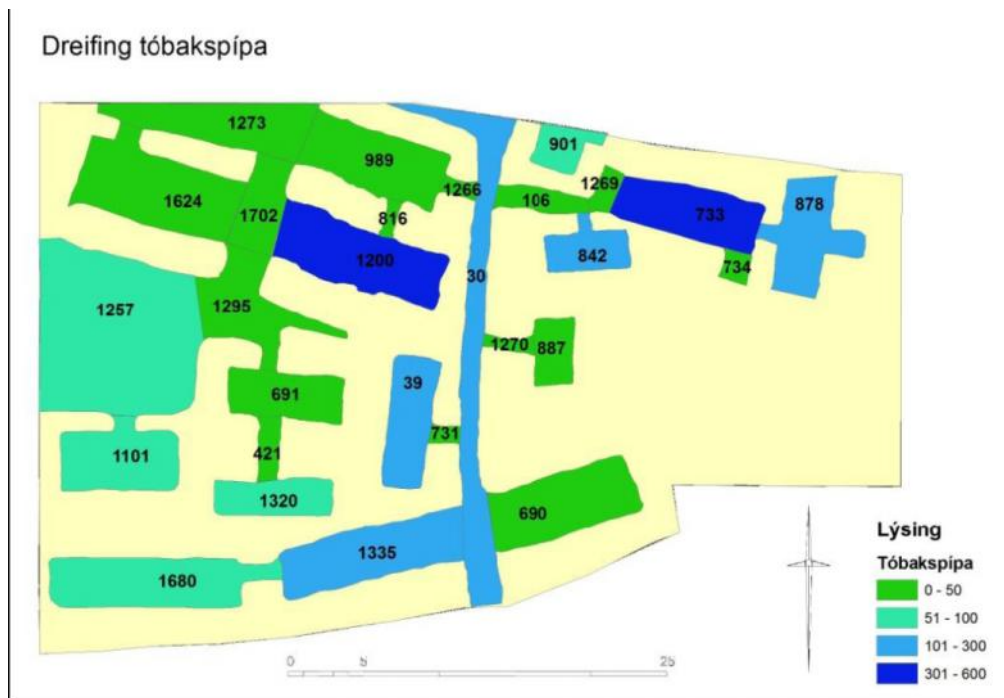


Figure 3.10: Distribution of clay tobacco pipes in Skálholt. The scale in the bottom right corner shows the quantity found in each structure (increasing numbers from green to dark blue) (Valmundsdóttir 2008, p. 28 fig. 8).

Other reports also name clay tobacco pipes as part of a larger find complex and at least touch on the social backgrounds. The act of smoking pipes in connection with drinking wine, beer, coffee or tea hints at a habitus of how and when and even where people in Skálholt used to smoke⁷⁰.

So far the only specialised studies on the Icelandic material have been done by Natascha Mehler. In her first article from 2002 she discussed the political and economic background at the time with a focus on tobacco itself. Mehler was able to find three written

⁷⁰ Snæsdóttir/Lucas 2007, p. 96.

sources that talk about the attempt to grow tobacco in the 18th century in Iceland⁷¹. The first was published in 1757 by Jón Snorrasson under the title *Tractatus Historico – Physicus de Agricultura Islandorum*⁷². Snorrasson claims that the soil in Iceland is as fruitful as in other parts of Europe and strives to prove that with the successful growing of plants like “*Linum*”⁷³, “*Canabis*” and “*Nicotia*” amongst the regular grains and herbs in Breiðafjörður in the West of Iceland. In a subsequent publication⁷⁴ from 1758, Snorrasson adds the advice that the seeds for the tobacco plant should be brought from places with a similar longitude, like Sweden, Norway or perhaps from Scotland. A practical experience is documented by the scholar Magnús Ketilsson in 1779⁷⁵. He sowed the tobacco in a heated bed and treated it like cabbage. Later on he gave the plants good earth and tender care and the tobacco grew. Unfortunately Ketilsson records that he was unable to retrieve any seeds to continue growing tobacco. All these were attempts to recover a weak economy at that time.

After the review of tobacco she presented clay tobacco pipes from one find complex: Aðalstræti 14-16. Within two excavation campaigns a total amount of almost 270 fragments were found⁷⁶. She was able to determine that a significant amount of identifiable fragments came from Dutch production centres. But in the find complex were also Danish products and at least one from England. In this first preliminary report the main focus was to find a date for the complex and establish its origin.

In Mehler’s second article from 2003 she gave an overview about the known clay pipe finds all over Iceland and presented a distribution map. According to her there are around 3100 fragments found up until 2003. The exchange of letters Mehler analysed, also spoke about tobacco consumption as a medical treatment. The pastor Arngrímur Jónsson wrote in a letter from the 7th August 1631 to his Danish scholar friend Óla Worm that he wanted to learn of the effects of tobacco as soon as possible⁷⁷. Jónsson wanted to know how to smoke tobacco with a pipe and how big the portion should be and when to chew the tobacco as well as when

⁷¹ Mehler 2002, pp. 65-66.

⁷² Jón Snorrasson, *Tractatus Historico – Physicus de Agricultura Islandorum* (København 1757).

⁷³ English: flax

⁷⁴ John Snorresen: Udtog af en historisk og physisk afhandling om Islændernes ager-dyrknin, skreven paa latin, og udgiven af John Snorresen, nu sysselmand i Skagefiords syssel norden paa Island. In: *Oeconomisk Journal eller maanedlige samlinger af udvalte practise Afhandlinger, til at forbedre Huusholdings-Kunsten, Land-Væsenet, Manufacturer, Handelen, og alt hvad uder det Navn Oeconomie i allervidtløftigste Meening player at befattes. Februarii Maanded. København 1758, pp. 57-95.*

⁷⁵ Magnús Ketilsson, *Nockrar tilravner gjørdar med nockrar sád-tegunder og pløntur hentugar til sædu og annarar nytksamlegrar brucktunar, sem med ábata kunna á Islande ad ræktaz. Hapsey 1779.*

⁷⁶ Mehler 2002, p. 67.

⁷⁷ Daviðsson 1898, p. 125.

to use it for example if on an empty stomach. In 1632 Worm answered⁷⁸ that he knew about some healthy results as long as it was taken as a medicine. Smoking tobacco was supposed to clean the phlegm from the brain and senses. Worm also writes that if a portion of tobacco the size of a nutmeg is soaked in wine for one night and a person drinks the wine it helps to throw up. Other than that Worm is unsure if it is healthy to take tobacco.

But tobacco as leisure was also mentioned. Brynjólf Sveinsson, the bishop of Skálholt at that time, ordered more pipes in 1675⁷⁹ while he had enough tobacco and was not just using it for therapy. Again, Mehler gave an overview of the clay pipes, mainly of their origins and dates. She was, however, able with the help of written sources, to place them into a broader social context. She painted a rough picture about the social classes in saying that not only the highest classes like bishops and their like used to smoke, but also the students of the school at Skálholt⁸⁰, knowing that these are still the offspring of the higher social classes.

Since then no further research has been done with clay pipes nor any case studies about social contexts.

It should be said at this point, that the aim of this master thesis is not to search for more and yet unknown original written sources. The main focus of the thesis is on the archaeological assemblage.



Figure 3.11: A stem fragment with band decoration (terminus post quem 1650). The right side has been wrapped in bark (photo taken by A. Wacke).

⁷⁸ Daviðsson 1898, p. 125.

⁷⁹ Hallgrímsdóttir, M., Viðey. Fornleifarannsóknir 1988-1989. Ritroð Árbæjarsafns 1. Reykjavík 1989.

⁸⁰ Mehler 2003, p. 172.

4 Methods

The following chapter will deal with the way the data for the analyses was collected and registered. Since the basis for this thesis is a material study, the information extracted was stored in a database. This decision has been made for two reasons. On the one hand for practical reasons: the size of the collection being more than 3300 pieces it was essential to retain an overview. On the other hand, the organisation of the whole Hólar research project utilizes a database, namely Intrasis (Intra-Site Information System). This is a GIS designed for archaeologists and was developed in Sweden⁸¹. In doing so, all finds, whether beads, ceramics, glass objects, tiled stove, iron nails or anything else, have the same basic information recorded and set in a pre-designed mask (figure 4.1 a & b). Thus the right-hand side of the mask is the same for all objects defined as a find. The left-hand side, however, can be adjusted to the find the category by the specialised researcher.

The data is a combination of the measurements taken in the field during excavation and closer observations done later in the laboratory. Thus a clay pipe fragment found on site was given exact GPS-coordinates with the total-station. In doing so, the find itself, in this case any fragment or a complete tobacco clay pipe, was connected to the layer and/or context where it was found, for example a floor or a foundation. Thereby the clay tobacco pipes can be viewed as points on maps and the surrounding information is easily accessible as well. After the finds are processed, further information is extracted and saved in the database. Attributes like the number of fragments, and primary measurements like the weight and size of the fragment are generally taken for all the finds from the Hólar excavation. In the following paragraph all the featured measurements will be explained in more detail except where data is self-explanatory.

4.1 The database

As mentioned above, the special characteristics recorded for the clay tobacco pipes are to be found on the left-hand side of the mask in the database. It shall be mentioned here, however, that the author of this master thesis was not the first researcher working with the clay pipe material from Hólar. Therefore not all the attributes chosen for a closer study and recording were defined by the author but by the researcher/researchers that worked in the Hólar research project at earlier times. Even though the author of this thesis had designed her own database prior to the work on the Hólar collection, the inherited database needed to be kept to for the integrity of the wider Hólar project. The author therefore only added

⁸¹ http://www.intrasis.com/engelska/index_eng.htm (last accessed 31.08.2014).

characteristics and features without deleting prior information. Moreover, she attempted to record some of the prior characteristics too for the sake of consistency. The complete clay pipe collection can be found in the appendix as the data was extracted from the database in the form of an excel-sheet (see CD at the back of this work).

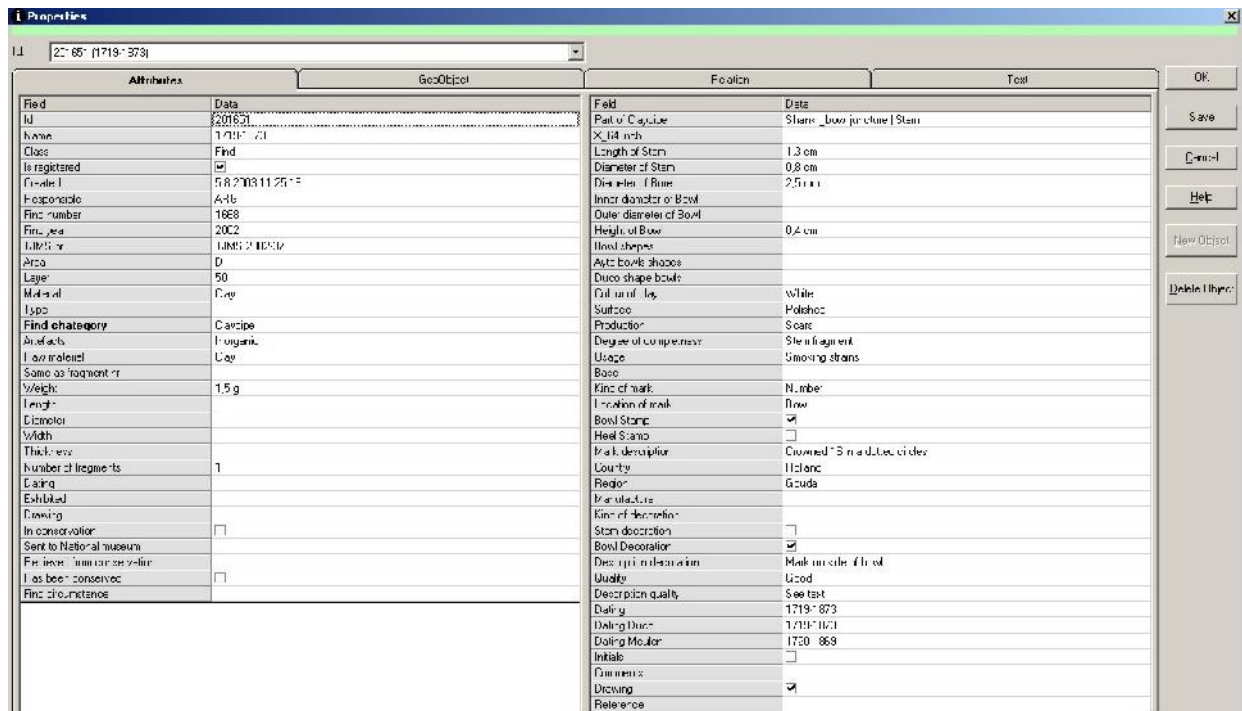


Figure 4.1a: A snapshot of a complete mask from the Intrasis-database. On the left side basic information which is the same for all finds are entered. The right side can be adapted to the researchers needs. This example shows the record for a shank-bowl juncture including a stamp.

Since the vast majority of the pipes are only parts and pieces, it is necessary to define what part of the pipe is presented. A drawing of a complete clay tobacco pipe with the terminology used in the database is shown in figure 4.2. The clay tobacco pipe consists of two main components: the bowl and the stem. However, since most clay pipe finds are fragmented further distinctions are necessary. These are made by adding whether the part of the pipe is the base, body or the rim of the bowl. And in a similar way the divisions for the stems are, whether the fragment comes from the mouth-piece or even the bite, or does it belong to the shank. Sometimes the fragment is exactly between the stem and the bowl and therefore called a shank-bowl juncture. In some cases only the heel has survived and is then put in as a heel. If only the bowl or only the stem is complete, and each lacking the other, no subdivisions will be made. When a complete clay pipe has been found, however, in the list many attributes can be chosen, like “bowl”, “stem”, “bite” and “heel”. Further down in the mask shown below

(figure 4.1b) the field called *degree of completeness* can be found in which it is possible to enter if the pipe is whole, or the bowl or stem is complete. More about this will be explained below.

Field	Data
Part of Claypipe	Shank _bowl juncture Stem
X_64 inch	
Length of Stem	1,3 cm
Diameter of Stem	0,8 cm
Diameter of Bore	2,5 mm
Inner diameter of Bowl	
Outer diameter of Bowl	
Height of Bowl	0,4 cm
Bowl shapes	
Ayto bowls shapes	
Duco shape bowls	
Colour of clay	White
Surface	Polished
Production	Scars
Degree of completeness	Stem fragment
Usage	Smoking strains
Base	
Kind of mark	Number
Location of mark	Bowl
Bowl Stamp	<input checked="" type="checkbox"/>
Heel Stamp	<input type="checkbox"/>
Mark description	Crowned 16 in a dotted circles
Country	Holland
Region	Gouda
Manufacture	
Kind of decoration	
Stem decoration	<input type="checkbox"/>
Bowl Decoration	<input checked="" type="checkbox"/>
Description decoration	Mark on side of bowl
Quality	Good
Description quality	See text
Dating	1719-1873
Dating Duco	1719-1873
Dating Meulen	1720-1869
Initials	<input type="checkbox"/>
Comments	
Drawing	<input checked="" type="checkbox"/>
Reference	

Figure 4.1b: Detailed view of the specialised right-hand side of the mask in the Intrasis database. The example is showing a fragment belonging to a shank-bowl juncture with a stamp.

Once the part of the clay pipe was identified, other measurements were done, depending on what part the pipe presents. With stems, first the diameter of the bore in 64th parts of an inch was recorded. This measurement was not done on all the stem fragments but only about 300 pieces as a sample study. This method was mentioned in the previous chapter.

To measure the diameter of the bore stem, a bore-drill with the size of either $4/64^{\text{th}}$ of an inch, 5, 6, 7, 8 or $9/64^{\text{th}}$ of an inch is inserted into the bore hole. In the following chapter this method (derived from Harrington and Binford) will be tested against other methods of dating to see whether it is of any use for the Hólar material. The diameter of the bore was measured in millimetres. These measurements, which had been done by previous researchers were not continued by the author (see picture 4.1b – fifth row from top).

Following the information about the bore diameter, basic recordings were taken of the length and diameter of the stem, all done in centimetres. The decision to measure in centimetres was done prematurely by the author to keep the same unit for all measurements. At a later point in the working process it was too late to change it back to millimetres, which would be the more natural unit for the analyses as rather finer and more precise measurements could be taken. However, this does not present much of a problem as can be seen in the appendix. The unit can be easily changed or converted in the excel-sheet. The diameter measurement was taken at two different points around the circumference of the stem to give an indication of how close the makers came to have the stem perfectly round. If it shows a rather oval profile it can be argued that the fragment is either part of the shank or was done with less care during the production process.

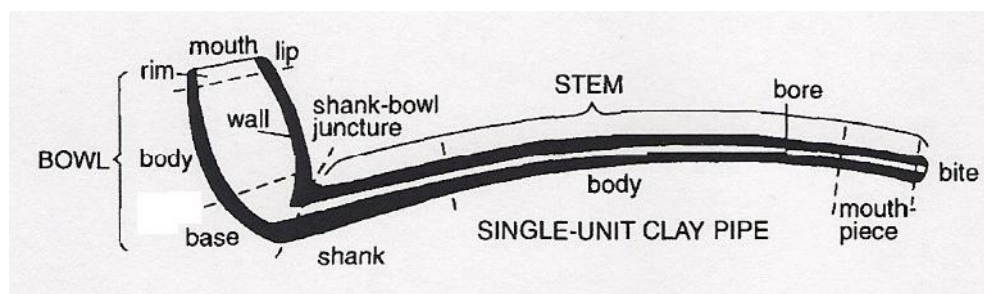


Figure 4.2: Schematic drawing of a clay tobacco pipe (Source: Bradley 2000, p. 105, fig. 3).

When recording bowls, two lines for the inner and outer diameter of the bowl were measured, but only when there is more than half of the bowl available. Since these are also features defined by former researchers, the author usually measured the inner and outer diameter at the top of the bowl. However, how the previous recorders handled this is unclear to the author. Given that the body of the bowl is curved or convex to various degrees, other archaeologists might have taken the size of the narrowest and widest part of the bowl. If so, it is unclear to the author of this thesis how these measurements are presented in the database, as there is only one field for the inner and one for the outer diameter prepared in the database.

The following feature, however, the height of the bowl has always been measured even if it was only a bowl fragment. This is to indicate how much of the clay pipe was preserved and to help in understanding the concluding analytical results or the absence of those results. Again, the unit measurement is in centimetres.

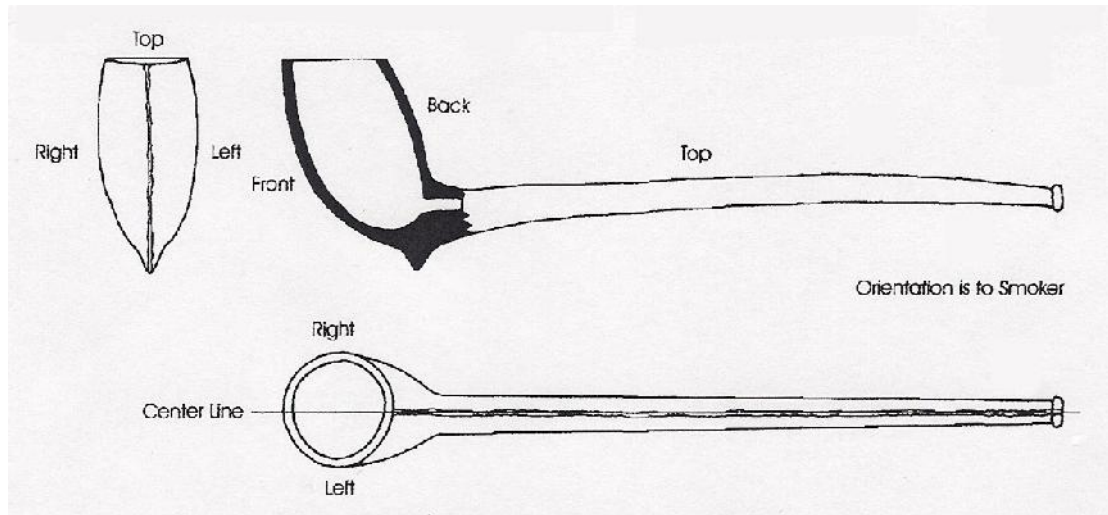


Figure 4.3: Orientation of clay tobacco pipes (Source: Bradley 2000, p. 105, fig. 2)

In addition the bowl shape is defined in so far as a fragment allowed this to be determined. There are three fields dealing with the form of the bowl: 1) bowl shape, 2) Ayto bowl shapes and 3) Duco bowl shapes. Only the first one was added by the author and is a field in which a short description can be written, if none of the following types apply. Both of the other fields were set up by former researchers and were also recorded where possible. The first one follows the simplified typology of the English clay tobacco pipes published by Ayto in 1990 (figure 4.4). Here one can choose from a list of 15 typological developments which equals most of the fragment at hand. For the Dutch products the simplified typology by Duco (see figure 3.5 in the previous chapter) is used in much the same way. Again the researcher chooses from a list the typological development of the bowl.

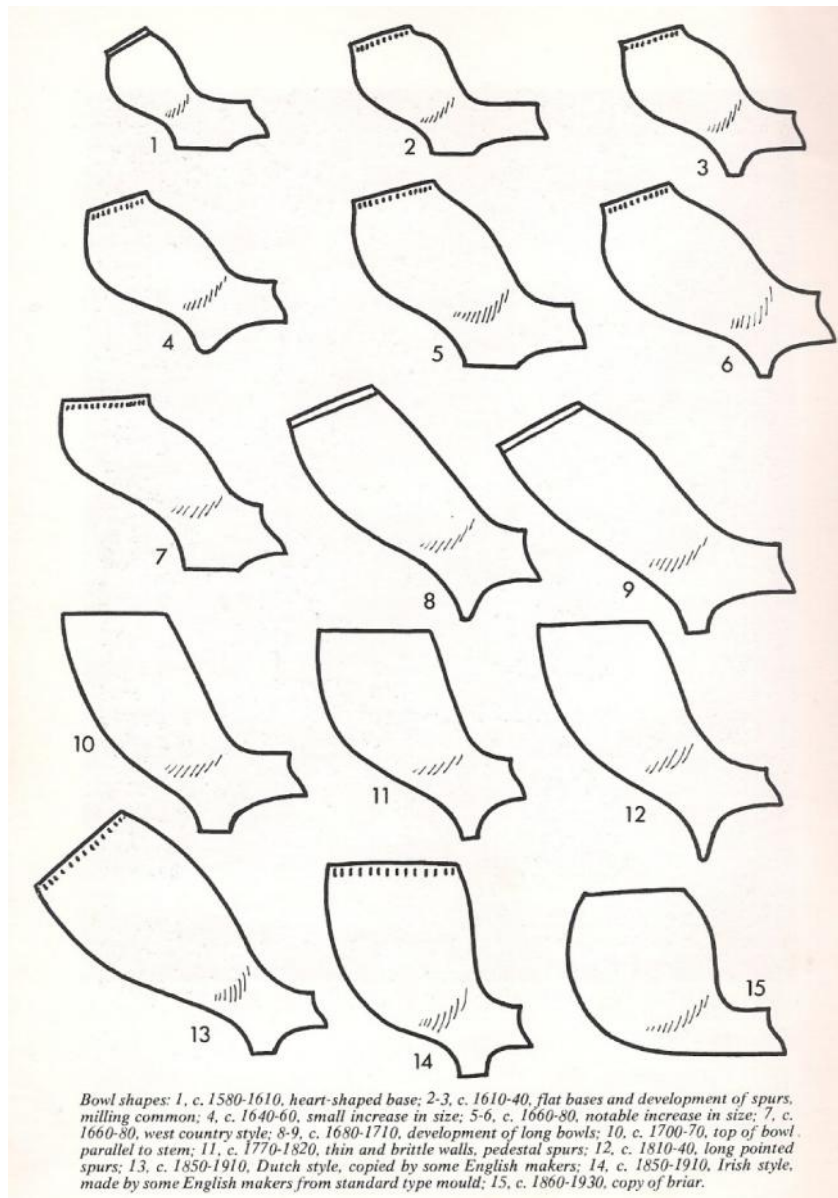


Figure 4.4: The typology presented by Ayto and used as a guide for the English clay pipes (Source: Ayto 1990, p. 8).

Once these stem and bowl aspects have been recorded, the fabric of the pipe is observed. This begins with the basic definition of the colour. From a list, hues can be chosen which include white, grey, black, reddish and yellow. The author is aware that the definitions of whites and greys are rather subjective. The hues of each of these colours are various and numerous. It was therefore useless to use a colour chart like Munsell to define the white of a tobacco clay pipe for instance. The author has experimented with colour charts but was as such unable to even find one colour that would fit the white of the clay pipes. Since there is no colour code for white, there would be many different ones for grey which would extend the list of colour too far and needlessly with no enlightening results being expected. Choosing from each of these hues the exact tone of grey did not seem useful either, since the whole

manufacturing process is done manually and slight variations in firing temperatures as well as other factors are to be expected. Moreover, different clays have diverse components that affect the colour of the final product not to speak of the mentioned mixture of imported and local clays. Also the colour black was not defined by a colour chart. Only the yellowish clay was defined by the Munsell colour chart. This was done because the yellowish clay always was rather the same hue, the implications of which will be discussed further in the following chapter. When, therefore, in the field describing the colour of the clay “yellowish” is chosen, it conforms to the code “10 YR 8/4 –very pale brown” in the Munsell chart for soil colours.

Another important attribute concerns the finish in the production process and describes whether a clay pipe was untreated, smoothed, polished or even covered with a glaze. Further information about the skills of the pipe maker were attempted to record in the field titled “*production marks*”. The list here comprises of trimming marks, fingerprints, mould lines and scars, which can be made by fingernails or by a knife slipping while taking away the excessive clay from the mould.

The next observation is the degree of completeness. As mentioned above, it is useful to know what part/parts one is looking at. This field defines more clearly whether the find is a bowl fragment or a complete bowl, a stem fragment or a complete stem or if a whole clay tobacco pipe was found. In few cases the clay pipe is almost complete either the bowl is unharmed but the stem has been broken off, or vice versa. It is also possible that the broken end shows signs of later human impact, like carving or smoothing of the surface and there is still the possibility that this fragment could have been used by the smoker the attribute will be called a “functionally complete pipe”⁸². This narrower description of the fragment should allow a faster overview of the analysed material in the end and will be discussed in the next chapter in more detail.

Now that the outer appearance has been defined the focus turns to the use of the clay pipe. In the field titled “usage”, the researcher can select various attributes at the same time to indicate whether a clay pipe was unused, smoking stains are visible, soot blackens the inside and/or outside, teeth marks are seen, chipping, use after breakage, repair, reuse, abrasion and as a secondary use mark, trowel marks.

To define references for the origin of the pipe as well as dating aids, other aspects are taken into account. First it is defined whether the bowl or stem fragment has a heel. This is

⁸² Bradley 2000, p. 106.

done in the field titled “base” and shows a list with the following attributes: flat foot, spur and peg/spike-style. If the bowl has a round base and no heel, nothing will be chosen from the list. But when on the fragment it is visible that there was a heel of any kind which has been broken off, an “X” will be made in the row to indicate that there was once some sort of a heel.

If there are any stamps on the fragment, they will be found in the field “kind of mark”. Thereby the stamp can be a name, number, initials or a symbol. The location of the mark can vary between the bowl, the stem or the base of the heel. The two fields labelled “bowl stamp” and “heel stamp” were set up by a previous archaeologist and can only be answered with yes or no. The next row leaves some space to describe the mark: which number it shows, or what kind of symbol –a figure, floral picture, building or similar, can be seen. It also gives room to note possible marks on the side of the heels, like the Coat of Arms of Gouda or the capital “S”, an indication for lesser quality. No separate field was installed to describe the possible marks at the side of the heels. This shortcoming will be picked up in the conclusions.

If the information gathered above permits, a conclusion as to the origin of the clay pipe will also be attempted here. The country list consists of Holland (The Netherlands), England, Denmark and Germany. If it is possible, the region of production can be narrowed down even further like Gouda, London, Falster Islands and so on. In very few cases the hand of the maker can be detected and his name will be found in the field of the manufacturer.

Subsequently it is necessary to look at the various forms of decoration. The list leaves choices like honeycomb, French lilies, roulette lines and bands, geometric patterns, floral decoration, flutes, effigy and Tudor roses, which implies mainly the much simplified and stereotyped circle of dots with one dot in the middle. In choosing any of these decorative styles no difference has been made whether the decoration is positive and in relief or negative stamped or carved into the moist clay. But in the field for the description of the decoration itself, a more detailed account is given. Often it is mentioned if the patterns are stamped or in relief. The two fields in-between, stem and bowl decoration, are only to be answered with yes or no, and are again the work of a former archaeologist. A last relict of former work by specialists on the clay tobacco pipes in the Hólar collection is the row called “initials”. It refers to the pipe maker’s initials. Again a yes or no answer is the only possibility.

After all the information above is collected, the question about quality comes in. From a list the attributes to be chosen are very good, good, middle and poor. How each of the quality decisions have been made can be followed in the next field entitled “description of

quality”. What values have been taken into account and how the differentiation between each step comes to pass will be explained in more detail in chapter five.

If the author was able to extract some date or time span from the fragments, the next three fields allow room for the results. The first field is labelled dating. Here all the dates able to define the piece are given, whether only a century, a *terminus post quem* like “post 1650” or a closer date range. The following two fields are exclusively for Dutch specimens which form the majority of the clay pipe collection. One is based on the older catalogue on stamps by Duco, the other the recent and added catalogue by van der Meulen. If these two date-ranges differ from each other, a combination is made. Thereby the earliest and last date are put together to give a maximum time range, unless it was otherwise possible to narrow the date further down, as will be explained below.

The last few fields are the comments, to be able to mention for instance if only half the stem has been found or other abnormalities that could be of interest, like if a stem fragment is wrapped in bark or a metal stick is found in the bore. The two fields at the bottom only tell if a drawing of the fragment has been made and if it was possible to date a fragment, the catalogue numbers and/or page numbers from the corresponding source are given here.

This is thus the general layout and nature of the information collected from the clay tobacco pipes for the database. The following part of this chapter is aimed to give a deeper insight in how more critical decisions like arriving at dates or distinguishing between qualities have been made and what other methods were used for this work.

4.2 Dating of clay tobacco pipes

To date the clay tobacco pipes all available sources were used. In what follows, it shall be described in more detail how the dates were determined.

The easiest and probably most favoured dating method by archaeologists is to use the stamps (see chapter 3). These stamps are mainly to be found on the base of the heel or if there is no heel, on the base or on the back of the bowl. These stamps can consist of letter combinations, numbers or little pictures and symbols like people, plants, architecture or almost anything else. Stamps are the identification mark of a certain pipe maker and are therefore protected by the rights of each guild. This principle was especially distinct in The Netherlands. Every maker used only his own stamp and symbol and when he stopped working

or died it could be passed on or sold to some other maker. Therefore the stamps can have a very long use life even if they are only used by one person at a time. If, however, it is possible to use other clay pipe characteristics to narrow down the mark of one maker, a rather short time span can be obtained. But even if this narrow time span cannot be achieved, it is almost always possible to give a time span in absolute years. This is due to the fact that The Netherlands were one of the biggest production areas with cleverly installed mass production and distribution systems to all parts of the known world. The rich written sources and long standing research on the production of clay tobacco pipes resulted in the first catalogue including all the known stamps from one of the main Dutch production centres at the time, Gouda. The catalogue produced by Duco in 1982 is sorted by the types of stamps. For some of the symbols Duco is even able to give an older and a younger version of the stamp. It was as yet not possible to connect all the stamps with the names of the pipe makers. In 2003 a new catalogue on Gouda stamps was published by Jan van der Meulen. He was able to list names and the time spans for the use of almost all stamps. Also he undertook some minor changes in some of the dates. The problem arises if the stamps are not from Gouda but another place either in The Netherlands or even from another country. Other such catalogues exist but are not as detailed as the Dutch material. Since a large amount of fragments have not been stamped, other characteristics need to be taken into account when dating clay tobacco pipes.

One of the other main tools for dating clay pipes still is typology and the development of bowls over time, especially when there are no stamps to be had, or their use-life is too long. Typologies exist even where there are no stamp collections. The leading authorities are Adrian Oswald for the English pipes and Don Duco/Jan van der Meulen for the Dutch products. The basic development in both countries is similar. A very small pipe with a bulbous shaped bowl, a long flat foot and a short very thick stem marks the beginning of the evolution. These transform into larger bowls with longer and thinner stems and a more defined spur. Finally the bowls can have all sorts of shapes, from very voluminous to almost parallel sides curving away in an obtuse angle; they can be with a spike for a heel or simply have a rounded base. The stem can be curved or even knotted in an artistic way.

But using typologies alone can sometimes result in rather large time spans but can still be narrowed down with the help of decorative patterns, if present. Decorations are subject to fashions that come and go with time. Therefore certain forms of decoration are very helpful as a dating tool. One of the earliest for instance is the “pinched decoration” whereby the stem has been pinched together with the fingers alternating on top of the stem and on the sites. This

style can be found from 1630 to 1670. Another pattern which lasted only for about twenty years is the French lilies, which was in fashion between the years 1630 and 1650. The so called Jonas pipe, also known as Sir Walther Raleigh pipe in the British literature, seems to be one of the favourites amongst clay pipe finds (figure 4.5). The stem shows a creature with scales and an open mouth with teeth at the shank-end. The bowl however has the face of a man with beard facing the smoker. The interpretation is either a Biblical one, assuming the creature to be a whale swallowing Jonas and thereby rescuing him from the stormy sea. On the other hand, Sir Walther Raleigh was a member of Queen Elisabeth I court who also founded a colony in North Carolina. The myth states that Raleigh was a heavy smoker and once fell when travelling by ship overboard into the water. There were crocodiles in the water and one was about to bite Raleigh but due to the strong smell of tobacco the animal lost interest and Raleigh was saved. In this way the man on the bowl would symbolize Raleigh and the creature would be a crocodile. Whatever interpretation one favours, this pipe was only in use between 1630 and 1670⁸³.

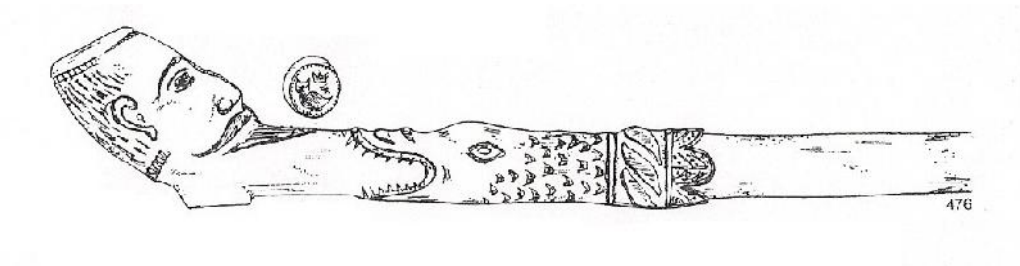


Figure 4.5: A drawing of a Jonas pipe (Source: Duco 1987, p. 92).

Similarly more decorative patterns and motifs can be dated, but these few examples given above should suffice. Another rather small dateable feature is the marks on the side of the heels (figure 4.6). The most common of these marks are for the Coat of Arms of Gouda with six stars arranged in two parallel rows. This mark was introduced in 1739 and can therefore serve as a fixed *terminus post quem*. The same applies to the capital letter “S” set above the Coat of Arms meaning “*slegte*”, being of a lesser quality, which was introduced in 1740. Other such marks are known like a various assembly of positive dots or a lying half

⁸³ Duco 1987, pp. 91-94.

moon. Furthermore, writing like the makers' name and/or the place of production start appearing from around 1740.

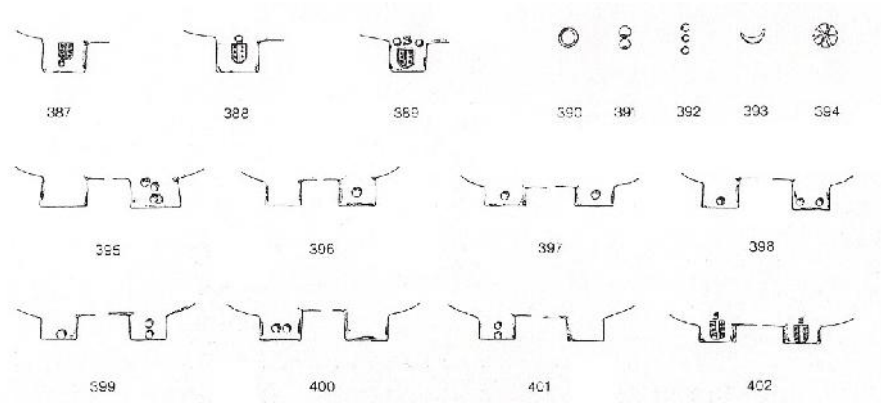


Figure 4.6: Examples for marks on the side of heels (Source: Duco 1987, p. 78).

Taking as many as possible of the listed criteria above into account and combining them to a sensible date was part of the aim of this work. However, it was not always possible to find dates since some fragments are too small or just indefinable.

4.3 Signs of Use

Having a representative sample of a continuous settlement like the Bishops see at Hólar, it seemed interesting to look at whether the clay tobacco pipes had been used and how so. Only a small percentage of the collection seems to be unused or was in use for such a short time that (almost) no traces of smoking could be detected. The majority of the pipes show clear use marks, mainly smoking stains. But some of the fragments show plainly that the end of a stem, for instance, broke off or had been broken off at some point in the past. The pipe stem however, was not always discarded but the rough ends were smoothed with various degrees of care and new teeth marks indicate a continued use. These kinds of observations have been defined as “use after breakage”. This does not only hold true for stems but also for a few bowls.

Another aspect is a fragment being reused. This means former clay tobacco pipes have been given a new purpose which does not necessarily have anything to do with smoking pipes. Furthermore, this new use does not require the use of a complete clay tobacco pipe but

only a part of it, like a fragment of a stem. Various examples like this have been mentioned in the chapter 2 such as pipe stems used as penny whistles or wig curlers.

4.4 The question of Origin and ICP-AES analyses

In the following paragraph the origin of the clay pipes shall be discussed. This is important since different production centres show various bowl shapes and developments so an identification of the place of production could help in using the correct typology. Furthermore, it is useful to know from where the clay pipes were imported in terms of trade patterns.

As described above, the main determination for the land of production is a combination from typology, especially if complete bowls are preserved, or stamps and inscriptions. Quite a percentage of the analysed material either show Dutch names or has the commonly known “IN GOUDA” written around the stem. Therefore the origin of the pipe is easily readable. However, not all the pipes with the well known “IN GOUDA” inscription have to have been made in Gouda since copies and imitations exist which claim to be of that origin⁸⁴. Clear copies were tried to be marked as such. Since it is not possible in many cases, however, to distinguish between original and a possible copy, they were treated as a Dutch product in this study. This is due to the fact that most of the material is too fragmented to be certain of the real place of production. In the case of the Danish pipes, names and the production centre are also written on the stem. It therefore seems more interesting to know where the vast majority of the pipe material, i.e. the undecorated stems came from.

In other archaeological studies which deal with clay as a basic raw material, a chemical analyseis commonly used to ascertain provenance. ICP (Inductively Coupled Plasma) analyses can give the chemical identity of the clay and therefore determine its likely geographical origin. To define the chemical identity of a pipe, a sample of the selected material has to be taken. The size of the sample need only be about 10mg for the analyses to be successful⁸⁵. This sample is then ground to a fine powder and dissolved in a 4-acid solution⁸⁶. Subsequently the solution is injected into an argon plasma. There the atoms are heated to very high temperatures, which cause the electrons to change and recharge orbits. The result is a coloured light of a particular wavelength, a so-called emission spectra. This

⁸⁴ Duco 1998, p. 12.

⁸⁵ Renfrew/Bahn 1991, p. 316.

⁸⁶ Brorsson 2009, p.5.

coloured light can be separated into a spectrum when passed through a prism or diffraction grating and can be measured by AES (Atomic Emission Spectrometry). Thereby the presence or absence of the various elements can be established by looking for the appropriate spectral line of their characteristic wavelengths. The final outcome is about 45 minerals and trace elements which are expressed as percentages for the commoner elements and in parts per million (ppm) for trace elements. The frequencies of each component are read off in tabular form (table 4.7). Due to the fact that ICP analyses produce a large amount of data –almost the entire periodic table is offered for study⁸⁷, the results are visualised through a cluster analysis in a dendrogram (figure 4.8). The aim of the cluster analysis is to compare samples of the same composition which are illustrated in the dendrogram. Groups of the same composition are samples that are closely matched with each other, meaning that the distance between them is no more than 5 links (see the x-axes at the top in figure 4.8).

SAMPLE NO.	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe
	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%
HOLAR C1	<5	12,06	13	239	1	7	0,24	<1	71	3	178	51	1,11
HOLAR C2	<5	10,78	6	504	3	7	0,18	<1	87	13	143	52	2,14
HOLAR C3	<5	10,32	<5	445	2	7	0,40	<1	120	4	112	126	1,67
HOLAR C4	<5	9,96	<5	309	2	<5	0,32	<1	77	5	144	36	0,86
HOLAR C5	<5	10,59	<5	352	2	<5	0,18	<1	98	8	126	59	0,90
HOLAR C6	<5	10,25	5	322	2	<5	0,28	<1	41	9	119	51	0,98
HOLAR C7	<5	10,56	6	243	2	6	0,21	<1	66	2	160	41	0,91
HOLAR C8	<5	11,22	7	470	3	6	0,15	<1	143	6	119	147	0,82
HOLAR C9	<5	9,94	<5	416	2	<5	0,17	<1	128	2	149	28	0,63
HOLAR C10	<5	10,35	7	360	2	<5	0,21	<1	118	2	138	27	0,64
HOLAR C11	<5	12,89	7	327	2	<5	0,23	<1	104	5	117	41	1,07
HOLAR C12	<5	10,46	<5	317	2	<5	0,15	<1	88	5	135	36	0,70
HOLAR C13	<5	9,98	<5	326	2	6	0,18	<1	100	2	133	23	0,82
HOLAR C14	<5	10,73	<5	288	2	7	0,35	<1	82	2	142	37	0,95
HOLAR C15	<5	8,26	<5	440	2	<5	0,13	<1	80	9	93	42	1,83
HOLAR C16	<5	9,57	5	213	1	<5	0,25	<1	43	1	127	59	0,80
HOLAR C17	<5	12,66	<5	517	3	<5	0,11	<1	112	5	122	37	0,84
HOLAR C18	<5	9,11	6	320	2	<5	0,19	<1	93	4	116	26	0,83

Figure 4.7: Abridgement of a table showing frequencies of components analysed by ICP-AES from samples of clay pipes from Hólar. The last column to the right shows the iron content. The information of the samples (first column at the left side) can be seen in table 5.6. (Brorsson 2009, Appendix I, page 7).

As mentioned above, the chemical ICP-AES analyses have been commonly used in ceramic studies for at least the past 60 years. The small amount of the sample size and a very high accuracy of ± 5 percent⁸⁸ make it a valuable tool in the field of pottery research, even though the sample is destroyed entirely in the process. Sporadic attempts to apply its use to clay tobacco pipe studies have been made, but so far have not been well received. The

⁸⁷ Lambert 2005, p. 480.

⁸⁸ Renfrew/Bahn 1991, p. 316.; see also Lambert 2005, p. 479.

emphasis still lies with typological studies and the analyses of stamps to determine the origin. To try the usefulness of chemical analyses in clay tobacco pipe studies however, about 30 samples of clay pipes from Hólar were tested. This analysis was performed by Torbjörn Brorsson in the ceramic studies laboratory in Sweden⁸⁹. The author of this paper decided on the selection of samples. Some of the chosen samples were already identified by stamps, typology or inscriptions to come from The Netherlands, England and Denmark. More samples were taken from decorated and undecorated stems with various coloured clays or quality types to widen the variety of the sample. Even if the origin of the tobacco pipe itself cannot be established, since the clay as a raw material might have been traded⁹⁰, certain groups or clusters may be expected to form and give results. The results and whether this method could be useful in clay tobacco pipe studies will be discussed in the next chapter.

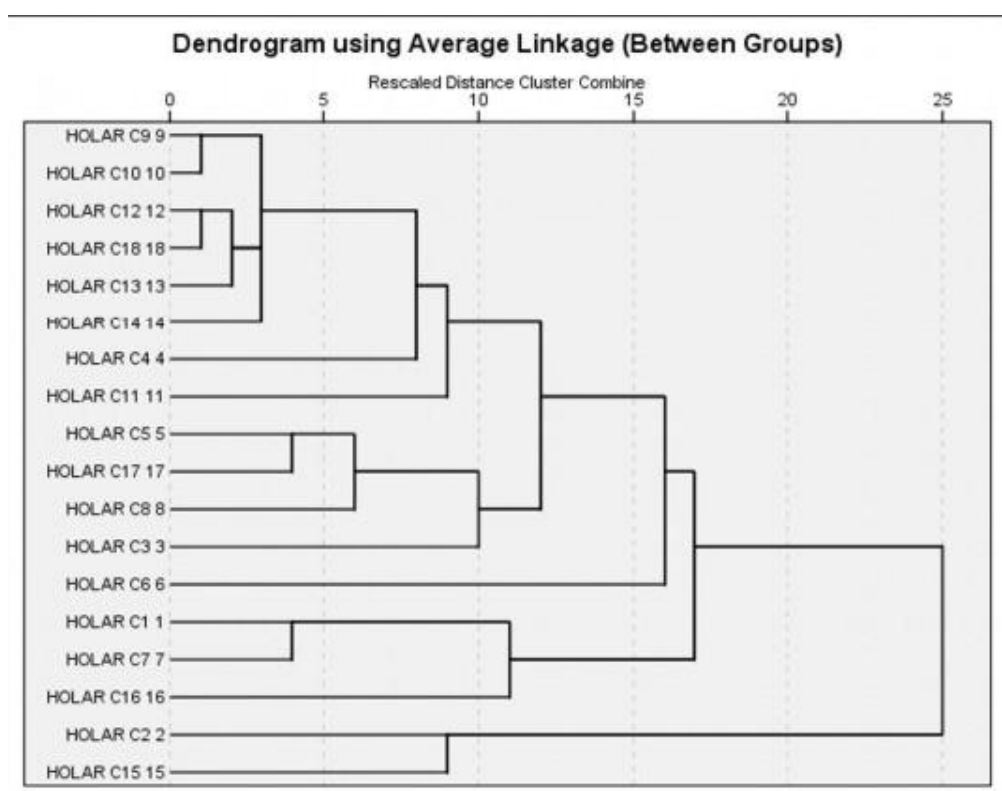


Figure 4.8: Visualisation of ICP-AES results. Appearing clusters are matching components of elements. The closer the linkage (less than 5 steps) between samples the more elements they have common and could therefore be made from the same clay/in the same workshop. The 6 samples at the very top form a cluster and are therefore most likely made from the raw material. See also extended dendrogram in figure 5.7 and the chosen samples listed in table 5.6 (Brorsson 2009, fig. 1, p. 6).

⁸⁹ <http://www.keramiskastudier.se/aboutkks.asp> (last accessed 31.08.2014).

⁹⁰ Duco 1981, p. 373.

4.5 Quality aspects

One of the main aims for studying the clay tobacco pipes from Hólar was the issue of quality. In written sources one can find accounts of various differences in quality, which commonly relates to the price and finish of the clay tobacco pipes. The main quality categories which can be taken from the written accounts are the “*porceleine*”, “*fijne*” and “*groffe*” clay tobacco pipe⁹¹. The “*porceleine*” (“porcelain”) is supposedly the highest quality with a polish that imitates real porcelain. This clay tobacco pipe was polished again after being fired with a piece of cloth and wax. The “*fijne*” (“fine”) tobacco pipe is a good quality with a good finish. The whole treatment is the same as the porcelain pipe just without the final polish. Duco mentions that “...it is not possible to distinguish between these two higher qualities”⁹². Lastly the “*groffe*” (“rough”) clay pipe, however, is the cheapest and therefore less carefully finished. These products are most likely unpolished with a sporadic surface treatment and trimming. According to Duco, there are two kinds of this quality which differ mainly whether some milling decoration was applied to the bowl.

Even though it is almost impossible to identify these specifically named quality categories in a very well preserved archaeological collection, let alone a collection mainly consisting of fragments and pieces, some differences in quality are visible and can be grouped together. One of the easiest indications is the mark on the side of the heel from 1740 in form of a capital “S”. This stands for “*slegte*” or lesser quality⁹³. This mark, however, could also be a sign for a copy of Dutch products. As illuminated the problem with copies above, the “S” will be treated as a sign for lesser quality in this thesis but assumed to be of Dutch origin.

Other less obvious signs are also looked at in this thesis. One of them is the colour of the clay on the outside. There are the greyish and whitish hues that are very regular. Other clay pipes show blackish spots or have a different colour at various parts of the pipe. These colours could be caused by soot on the outside and are therefore no indication for quality. But it is possible that pinkish and blackish hues are spotted on a white or grey clay. If these are not secondary, like being burnt again in a house fire, but happened during the production process, than the colours hint on a lower quality. Another way to look at quality is to examine the fracture of the clay, which is easily done, since the vast majority of the collections are fragments already and the break is clearly visible. Normally the clay is very fine with almost nothing to see with the bare eye. If the clay shows dirt particles that occur moderately or even

⁹¹ Duco 1981, p. 375.

⁹² Duco 1981, p. 375.

⁹³ Duco 1987, p. 77.

frequently and are visible with the unaided eye, then the clay is not the best for the making of smoking pipes or at least not the finest kaolin clay was used as a raw material. If there are mainly air bubbles to be found inside the clay and on the surface it might just hint at less skilled or controlled manufacturing.

The surface treatment of the pipe is also very helpful in defining the quality. It takes time to cut off the excess clay from the moulds and trim rough edges. It also takes some knowledge to polish the surface to any degree.

If there is decoration to be found on the pipe it can also give a clue to the skills of the pipe maker. Are the decorations regularly and evenly applied, or are they carelessly done and parts are not imprinted, details not to be seen or are bands going unintended almost diagonal around the stem or show a lot of overlapping pattern? If the decoration is carved into the mould there is a difference in the richness of details. The clearer the decoration is carved in the mould the higher the quality of the pipe. However, is the mould worn out the details will get blurred as the stiff clay is of an abrasive character. The same criteria apply to the stamp and the marks on the side of the heel.

Finally the firing process is important. If high temperatures are reached, then the clay will be hard and well fired. Otherwise the clay stays slightly porous and soft.

Production errors are also relevant. If repetitive they show the limited skills of the makers.

In the Hólar collection there are some pipes which are white on the outside but vary from dark grey to black in the inside. This colouring, however, was not done by the use of the pipe and is therefore not to be confused with the more brownish smoking stains which occur from the tobacco juice. This phenomenon was first thought by the author of as a production error, mainly a firing error. Therefore another analysis method was used. To see the expected differences in the firing process three thin sections of three different pipe stems were made. The analyses of the thin sections were carried out again by Torbjörn Brorsson in his Ceramic Study laboratory in Sweden (see above). The author picked out the most representative samples for this analyses from the Hólar collection. Thin sections, similar to ICP-AES analyses, are mainly used for ceramics, stone artefacts and metals, not clay tobacco pipes. A thin section is a wafer-thin cut from the ceramic or clay pipe in question. The sample is cut so precise that a look through a light microscope can reveal all the components of the raw material (figure 4.9). These components need to be studied by a petrological expert to define

the specific minerals. Since the middle of the 19th century, thin sections have been used as a tool for identifying the origin of the raw material⁹⁴. In this study, however, the thin sections were used to look at production processes, namely firing processes, rather than to study the origin of the clay.

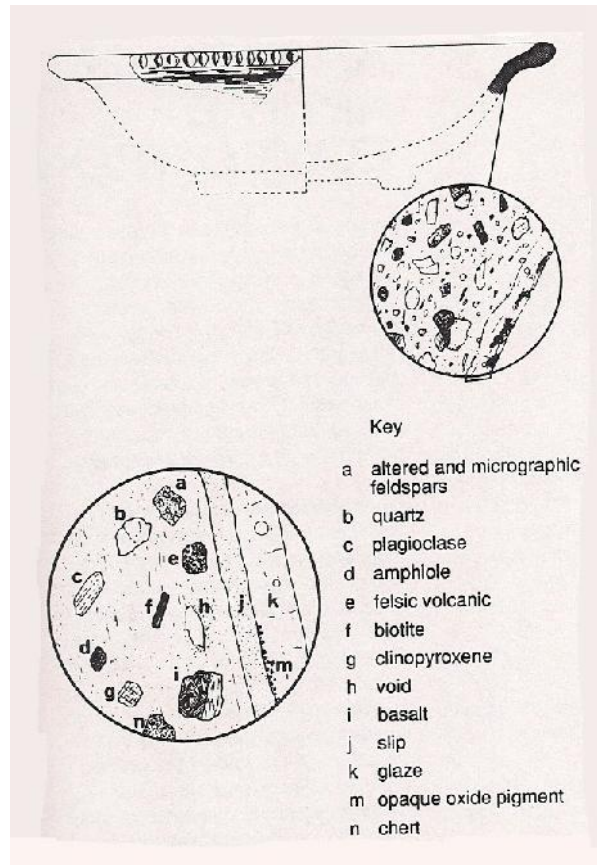


Figure 4.9: Simplified example of how thin sections are taken and what they can show (Renfrew/Bahn 1991, p. 315.).

Using thin sections on the tobacco clay pipes, it became clear that the pipes of a supposed lesser quality with greyish black clay in the inside and white clay at the outside are not such. The clay is of the same consistency all the way through and therefore another interpretation for this variation will be suggested in the following chapter.

Based on all these considerations, a working division and first attempt to categorise the quality of clay pipes has been made for this thesis. Four groups were established: 1) very good quality, 2) good quality, 2) middle quality and 4) poor quality. The criteria designed for the four groups are summed up in the table 4.10 below.

⁹⁴ Renfrew/Bahn 1991, pp. 314.

A clay tobacco pipe of a very good quality would have an extensive surface treatment, probably comparable to Duco's porcelain and fine pipes. It is highly polished and the colour of the clay is regular. This usually is connection with light-coloured hues (white and light grey) but could also apply to an evenly black fired clay pipe. If decoration is available it is very even, regular and rich in detail. The form of the stem is very regular and as close to perfectly circular as possible (according to which part it belongs; compare figure 4.2). The clay itself does not contain any inclusions visible with the naked eye nor any air bubbles. Lastly the pipe was very hard fired at high temperatures if it was made in the 18th century. This clay tobacco pipe is as close to perfect as it can be.

A good pipe has many of the attributes like the one just described, the colour of the clay is rather even, the surface has been polished but might show some production marks like scratches. The decoration is also mainly even and regular but might allow a little overlapping decorations and very slightly blurred patterns. The stem might be slightly oval. The firing however was carefully and well done.

The middle quality pipe shows some lack of care. The colour might be stained by pinkish lines or with darker spots. The surface is smoothed and shows some production marks like scars, knife imprints and finger prints, air bubbles at the surface or cracks in the clay. The stem diameter usually shows irregularities and tends to be more oval. In the break of the clay some rather large grains of sand/dirt particles can be easily seen and decorations are done slightly carelessly with overlapping and irregularities. Finally the pipe might not be fired too well so the clay seems slightly soft even though the clay pipe is a product of the 18th century.

The poor quality product shows an irregular colour on the surface. Common are colour changes from one end/side to another. It almost always has clear production marks with no surface treatment or only very poorly smoothed. The decorations are blurred and very irregular, sometimes only applied at the back of the pipe, the part which faces the smoker. It is very hard if not impossible to define stamps, if available. The stem would be of a very oval profile even at the mouth end and measure a thick diameter (up to < 1cm). And even though the pipe was made in the 18th century or later the clay is fired very soft and porous.

Quality group	Criteria
Very good	<ul style="list-style-type: none"> - Regular coloured clay on the surface - Extensive surface treatment - Decorations are regular and rich in detail - Very regular stem diameter - Elegant overall shape - Very good/hard fired clay (18th century onwards) - No dirt particles visible with the bare eye
Good	<ul style="list-style-type: none"> - Rather regular coloured clay on the surface - Surface is treated well but might show small defects - Decorations are clear visible but not too detailed; applied decoration might be overlapping - Slightly oval stem diameter - Good/hard fired clay (18th century onwards)
Middle	<ul style="list-style-type: none"> - Colour of clay is stained to some degree - Smooth surface with some production marks - Rather oval stem diameter - If decoration occurs: rather carelessly applied (large amount of overlapping, band decoration spiral unintentionally diagonal around stem, etc) - Rather soft fired clay (if it is a product of 18th century onwards)
Poor	<ul style="list-style-type: none"> - Irregular colour; possible colour changes - Poorly smoothed surface with clear production marks - Very oval and large stem diameter - If decoration occur at all: sloppily applied so they are barely visible; only partly applied i.e. back of bowl) - Very soft fired clay (if it is a product of 18th century onwards)

Table 4.10: Overview over newly defined quality groups and their criteria.

These four quality categories do not necessarily work as an absolute set of attributes with which one can define the quality of a pipe at hand. It is rather the first attempt to categorize the differences which can be seen in such a large collection like the one from Hólar. But a poor quality pipe can as well show a regular and very white colour on the outside but is poorly finished and fired that will lead to the decision for a poor quality. A very good

pipe on the other hand could show an irregular colour since the tobacco juice from a long time of use discoloured the surface. It is thus also a subjective distinction which comes with the feeling and experience of working with clay tobacco pipes.

These quality categories are made to test the idea of visible quality differences and how to work with them. Though Duco and others often refers in various articles to a better or poor quality of clay pipes, no categorised effort of classification seems to be made. The results of the test will be described in the following chapter.



Figure 4.11: A stem fragment with distinct diagonal carving inwards to the bore. This could be a sign of repair (photo taken by A. Wacke).

5 Results

As the previous chapter described the methods used to analyse the pipe fragments collected during the excavations, the following chapter will present some of the first results. It should be said at this point that more general conclusions will follow in the final chapter.

5.1 The collection

The total amount of clay tobacco pipes found in Hólar between 2002 and 2010 are 3,333 fragments. The vast majority is represented as incomplete clay pipe fragments of various shapes and sizes.

As mentioned in an earlier chapter, a clay tobacco pipe consists of various parts. Therefore the first distinction was to identify the fragment as part of a stem or bowl. This first step of analyses was in almost all cases possible. The result is that there are far more stem fragments, a total of 79%, than bowl fragments which amount to 20%. Only one percent represents complete bowls.

A finer distinction, if possible, was then undertaken. The fragments were placed in at least in one or more basic category (see table 5.1).

Bowl (20%)	Rim
	Body (3%)
	Base
Shank-bowl-junctures	
Heel	
Stem (79%)	(Body –if not further distinguishable) (68% plain stems)
	Shank (5.5%)
	Mouth piece (4%)

Table 5.1: Categories for more detailed distinctions of clay pipe fragments.

If, for instance, a clay pipe fragment was defined as a stem fragment then it could also be part of the shank and/or have a mouth piece. In this way the categories are non-exclusive. This is especially clear in the few cases where a complete bowl was preserved.

Most of the bowls are, however, merely fragmented. The category defined as “bodies of bowls” are barely 3% while the rim occurs most often.

The identification whether a stem is complete or fragmented was not always clear to define and results therefore in a total of only 6 complete pieces.

More than half of the stem fragments could not be distinguished any further⁹⁵. Yet most of these fragments are also undecorated and can therefore only be labelled as plain stems.

Only a much smaller amount, less than 6% could be defined as being part of a shank⁹⁶. Mouth pieces are as yet still harder to find. Mouth pieces are defined in this work as parts of the stem either with teeth marks or with the rather clear small ridge visible where the metal rod has been removed. In this work there has been no attempt made to distinguish originally manufactured mouth pieces from the later fashioned ends after part of the stem was broken off. Yet they show up with only 4% in the whole collection of the site.

Only one intact clay tobacco pipe has been recovered in Hólar. However, the idea of a functionally complete pipe comes from being able to smoke the clay pipe, even though part of the stem or the bowl might have been broken off at some point in the past⁹⁷. Thereby the pipe consists only of part of a stem and/or bowl but enough that the pipe could still be used. In this case the smoker usually had to smooth the broken ends, like the stem, and carve a new mouth-piece onto it. By doing so the clay pipe could be used further but is not the same shape as it was when originally purchased. Nine such clay pipes could be identified within the whole collection.

It is of no surprise that the strongest represented group with about 80% are stem fragments. Since the stem is the longest and most fragile part of clay pipes this result was to be expected. The length varies between less than 1cm and up to 11cm. The majority of stem fragments are short remains between 1.5cm and 2.5cm. This impedes the reconstruction of the former complete pipe stems in the 17th and 18th century which had a length up to 20cm⁹⁸ and sometimes even grew to more than 50cm.

This average shortness is easily understandable for the pipes from floor layers inside a house. The shorter fragments are usually found in the middle of the floor whereas longer ones were found closer to the walls (see below). This short size of stem fragments does not present a contradiction to the fragments from the mixed top soil layers, like layer [50] and others,

⁹⁵ There are 68% plain stem fragments –total count of 2250 fragments.

⁹⁶ There are 5.5% shank fragments defined –a total of 180 fragments.

⁹⁷ Bradley 2000; p. 106.

⁹⁸ Duco 1987, pp. 39 and pp. 43.

either. Top soil layers have been moved and disturbed over time in various ways. It is also known that especially in Hólar the former school of farming was teaching students to use bulldozers. In this connection the size of any object found in mixed layers as such should be expected to be limited.

5.2 Dating

The main tools for dating the material from Hólar are typologies and catalogues with stamps, markers marks and if possible the decoration patterns. Only a rather small portion of the collection offered any detailed clues about the dates of production. A mere 16% was able to be connected to dates ranging from one possible fragment from the late 16th century all the way to the 19th century. The strongest time presented is the 17th century. With some clay pipe fragments it was not possible to distinguish any further than the 17th/18th century. The 18th century is fairly good represented as well which suggests that clay tobacco pipes in these two centuries were most in use and fashion. A rather small amount reaches out through the 19th century. There are 28 fragments, however, which give a 200 year time-span. These fragments were either too small for further dating or because of the inexperience of the author.

Time	Total number of fragments
16 th century	1
17 th century	405
17 th – 18 th century	28
18 th century	151
18 th – 19 th century	29
19 th century	4
17 th – 19 th century	28

Table 5.2: Distribution of the time spans from the complete collection (only 16% was datable material).

To give a more detailed picture, these two main centuries have been subdivided.

One of the earlier clay pipes which can be dated is a stem fragment with a very simple pinched decoration found in area F in 2008. It dates from the time between 1630 and 1670. So far there has only one fragment with this type of decoration been found in Hólar. Furthermore this find was unearthed in the house of Guðbrandur Þorláksson, bishop in Hólar from 1571 until 1627. The house being of a timber framing and the first of its kind in Iceland. It was built

in 1587 and stood until 1787⁹⁹. Since this time frame of the found clay pipe does not fit either to the first or the second half of the century it was categorised as belonging to the middle of the 17th century. In this manner all datable fragments have been grouped. There is no overlapping or single fragments counted to two different groups.

17 th Century	Total number of fragments
1 st half 17 th century (1600 – 1650)	42
Mid 17 th century (1630 – 1660)	24
2 nd half 17 th century (1650 – 1699)	18
Post 1650	321

Table 5.3: Distribution of datable clay pipes throughout the 17th century.

There is, however, a problem with the group with the highest amount of fragments. For some of the clay pipes it was only possible to give only a *terminus post quem* of 1650. The author was unable to find a more detailed date which means that these dates can vary from the second half of the 17th century down to the 18th century possibly even to the 19th century. This date derives from the observation of an ornamental band decoration which was invented around 1650/1660 and used for a long time.

The first half of the 17th century is shaped by diamond enclosed French lilies and floral decoration, both of which were only on top of the stem. These decorations reach also into the middle of the century. Around that time the ornamented band came into fashion and went around the whole stem. The patterns are still rather crude with usually one row of circles and a varying amount of bands following. Thereby the stem diameter itself is rather thick between 9.5 mm up to 12 mm. This pattern, varying in its arrangement, seems to be used for a long time. Decorations are not the only indicators used for dating the clay pipes. Stamps, at the heel or at the back of the bowl, marks on side of spur, as well as typologies are used equally.

⁹⁹ Lísabet Guðmundsdóttir in a personal comment.

18 th Century	Total number of fragments
1 st Half 18 th (1700 – 1750)	74
Mid 18 th (1730 – 1760)	61
2 nd Half (1750 – 1799)	16

Table 5.4: Distribution of datable clay pipes throughout the 18th century.

In the beginning of the 18th century this ornamental band decoration was continued but with multiplied bands which are sometimes added to a zig-zag pattern at the end, instead of the row of circles. In a few cases there are some rows of mere zig-zag patterns which date to the very beginning of the 18th century. Diagonal flutes also appear in the time between 1700 and 1740. The so called Jonas-pipe, also known as a Sir Walter Raleigh pipe (see chapter 4 figure 4.5), occurs between 1630 and 1670.

In the Hólar collection it is certain that one Jonas-pipe was found. It is a complete bowl with all the features named above including ears. Around the rim it shows a roulette line and a stamp at the heel. Unfortunately the stamp is unknown to the author, showing a crowned Tudor rose flanked by an “A” and “I”. It is possible that two stem fragments belonging to a Jonas-pipe were found as well. These two fragments show a possible scale decoration¹⁰⁰.

In the 18th century there are also name-bands to be found. These stamps are usually composed of the maker’s name, followed by some band-ornament and ending with the name of the production site. These inscriptions are imprinted around the stem which can help to date them more specifically. In the case of the Hólar collection, marked stems from The Netherlands and Denmark are known.

Stamps and marks on side of the spurs are still in use in the 19th century. They can occur in combination with the name bands.

Altogether the dates for the 18th century offer a clearer picture. The emphasis is in the first half and starts decreasing around the middle of the century. A clear decline in the latter half of the 18th century suggests that clay pipes were not so frequently in use anymore. It also seems interesting that quite a few of these 16 fragments of this later time period are of Danish origin. The reasons for this are discussed further in the conclusions to this thesis.

¹⁰⁰ The bowl has the find-number **11305**, is 2.7 cm high and was found in context [88590] in area D. The stem fragments have the find-number **469** and **6658**, are 1.0 cm and 3.0 cm long and were both unearthed in layer [50] in area D. Unfortunately both layers [88590] and [50] are mixed topsoil layers and can give only limited further information.

More than three-quarters of clay pipe fragments are undecorated. These include both stem and bowl fragments. Where it was impossible to use typological dates, these fragments could not be used for dating.

5.3 Origin

The vast majority of the clay tobacco pipes found in Hólar is of Dutch origin. This could be determined through writings and stamps on the pipe fragments, bowls and stems alike. Some fragments showed a name or the lettering “IN GOUDA” which put them to a Dutch origin. From the collection of stamps in the Hólar collection most pipes were produced in Gouda. Gouda being the main production centre of the time, this is of no surprise. There are, however, three fragments unearthed which come from a different production place in The Netherlands. Twice the stamp “WS” in a circle was found and once the monogram “TM”¹⁰¹, the latter stands for Jan Muur. All of the fragments were made in the first half of the 17th century¹⁰². The maker’s name of the first stamp is unknown but it is most likely that all of these clay pipes came from Amsterdam.

In this connection it is also important to note that two fragments were identified to have been made from the exact same mould. These are two stem fragments with a floral decoration on top¹⁰³ of the stem dating between 1625 and 1650. This was derived from the decoration showing in the same places the same kind of use at the mould. It is most likely these clay pipes also originated from The Netherlands.

However, most of the stem fragments are undecorated and unmarked. A great number of fragments showed a greyish hue of the clay and seem to be very good/hard fired. The surface of these greyish stem fragments is almost always polished. Also the overall shape was mainly elegant and regular. Luckily a few remaining fragments of these types had Dutch names on them. Therefore samples were taken from both, fragments which in origin was determined by the name as well as samples of unknown provinces. With the help of ICP analyses it was possible to ascertain that the fragments with this greyish hue in the white clay are from Dutch production centres. In figure 4.8 one of the Dutch groups is clearly visible. The six samples at the top right corner are so very similar that they are surely from one

¹⁰¹ The fragments have the find-numbers **5879, 9024** and **5377**. The first two are found in different layers in area D while the latter comes from area E. The monogram “TM” could also be “JM” as it stands for Jan Muur, but looked on the stamp rather like a “T”.

¹⁰² See Duco 1981, p. 248 nr. 107 and p. 257 nr. 189.

¹⁰³ The first is find-number 1722 from the topsoil layer [50] in area D, while the second fragment, find-number 12459, was found in topsoil layer [88590] as well in area D.

production place, maybe even from one workshop. At the very least for these clay tobacco pipes the same raw material was used.

There are a few clay tobacco pipes that were made in England as well. Their number seems so small however that English products do not seem to have played an important role in the Hólar seat of bishopric or else, English fragments were not identified as such due to lack of experience with that material. It must be added that this argument holds true for the identification of Dutch products as well. But the general tendency of the provenance is not harmed by some misinterpreted fragments as is shown in the final chapter.

Only 17 fragments have been considered to be from an English manufacturer. This is the result of the author's work as well as from specialists working previously on a small fraction of the Hólar collection¹⁰⁴. There are few complete bowls which can be dated in the second half of the 17th century. This time frame is based on typological assessment. On the back of one bowl are the letters "RH" imprinted. The initials exist in England in a workshop from London. However, it is uncertain whether this really is an English product. It was thought of as being from London because the clay looked different than the others described above.

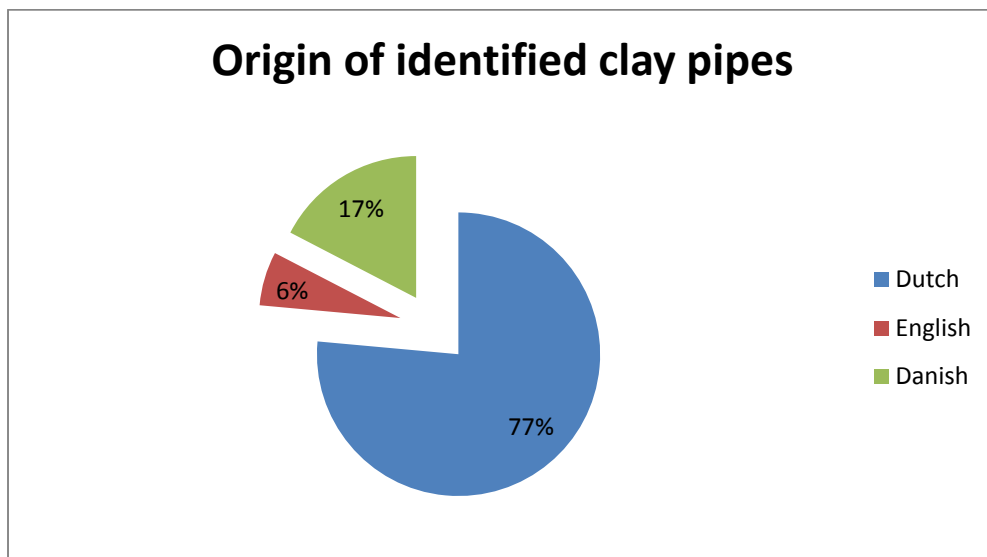


Figure 5.5: Overview of provenance of the less than 300 identifiable fragments.

¹⁰⁴ The author has been told that some of the complete bowls were identified by Arne Åkerhagen before the author started working with the Hólar collection. As he is an expert dealing with clay pipes, especially with the Scandinavian material, the author of this thesis has been using his identifications unquestioned.

ICP analyses have also been taken of the supposed English fragments. These at least confirm that the clay was different to the Dutch products, which suggests another place of origin but cannot give any more detailed information.

Sample	Find no.	Origin	Date
1	2002-37-919		
2	2002-37-1472	Denmark?	
3	2002-37-1551		
4	2003-37-3517	Rossi-Copenhagen	1758-1764
5	2004-37-5377	Amsterdam	1635-1650
6	2004-37-5502	England?	
7	2004-37-5824	Leendert De long, Gouda	1744-1774
8	2004-37-5913	Salisbury style, England	1650-1670
9	2005-37-7619	Dutch?	
10	2005-37-7970		
11	2005-37-7978		
12	2005-37-7985		
13	2006-37-9217	Gouda imitation	1719-1869
14	2009-37-12583	Gouda	1690-1819
15	2009-37-12590		
16	2009-37-12720	Haan, Gouda. Red fired	1655-1872
17	2009-Area E		
18	2009-No context		
C59	2002-37-168	Danish?	
C60	2003-37-2669	England	1640-1670
C61	2003-37-2693	England	1660-1680
C62	2003-37-3585	Reddish clay	
C63	2004-37-5371	Dutch? ([L]UCA and a snake stamp)	1667-1808
C64	2004-37-5879	Amsterdam (WS stamp)	1625-1650
C65	2004-37-5911	'Snoekebek pipe'	
C66	2004-37-6620	Gouda (Oil jug)	1745-1775
C67	2009-37-12595	Dutch?	
C68	2010-37-12914	Unused English?	
C69	2010-37-12928		
C70	2010-37-13065	Stubbekøbing? (Falster Island -DK)	1767-1798
C71	2010-37-13529	English?	

Table 5.6: List of chosen samples for ICP-AES analyses, thermal analyses or thin sections (source: Brorrson 2010, table 1).

Even though England and The Netherlands were the leading manufacturers of clay tobacco pipes and are therefore the most and widest traded and distributed throughout the known world at that time, another place of production was found in the Hólar material. In Denmark, tobacco pipe factories can be found in different places like Copenhagen, the Falster Island or Jutland. Nevertheless, Danish pipe manufacturers could not build on the long working tradition and experiences like the Dutch or English ones. Furthermore, none of the Danish factories seemed to have lasted longer than about 20 years before changing ownership or having been shut down¹⁰⁵. Smaller workshops with shorter life spans seem to be only possible to provide for the need of the people of their own country. It is known, that Dutch products were imported to Denmark as well. Yet, in the collection of the Hólar tobacco pipes from the percentage of Danish products have been compared to the Dutch masses and it seems still significant. Iceland was under the Danish trade monopoly from 1602 till 1874¹⁰⁶ and it

¹⁰⁵ Ahlefeldt-Laurvig 1980, pp. 249-250.

¹⁰⁶ Karlsson 2010.

therefore not surprising that some Danish workshops are represented in the collection. Altogether there are 48 fragments likely of Danish origin, which is 17% of all the datable material from Hólar.

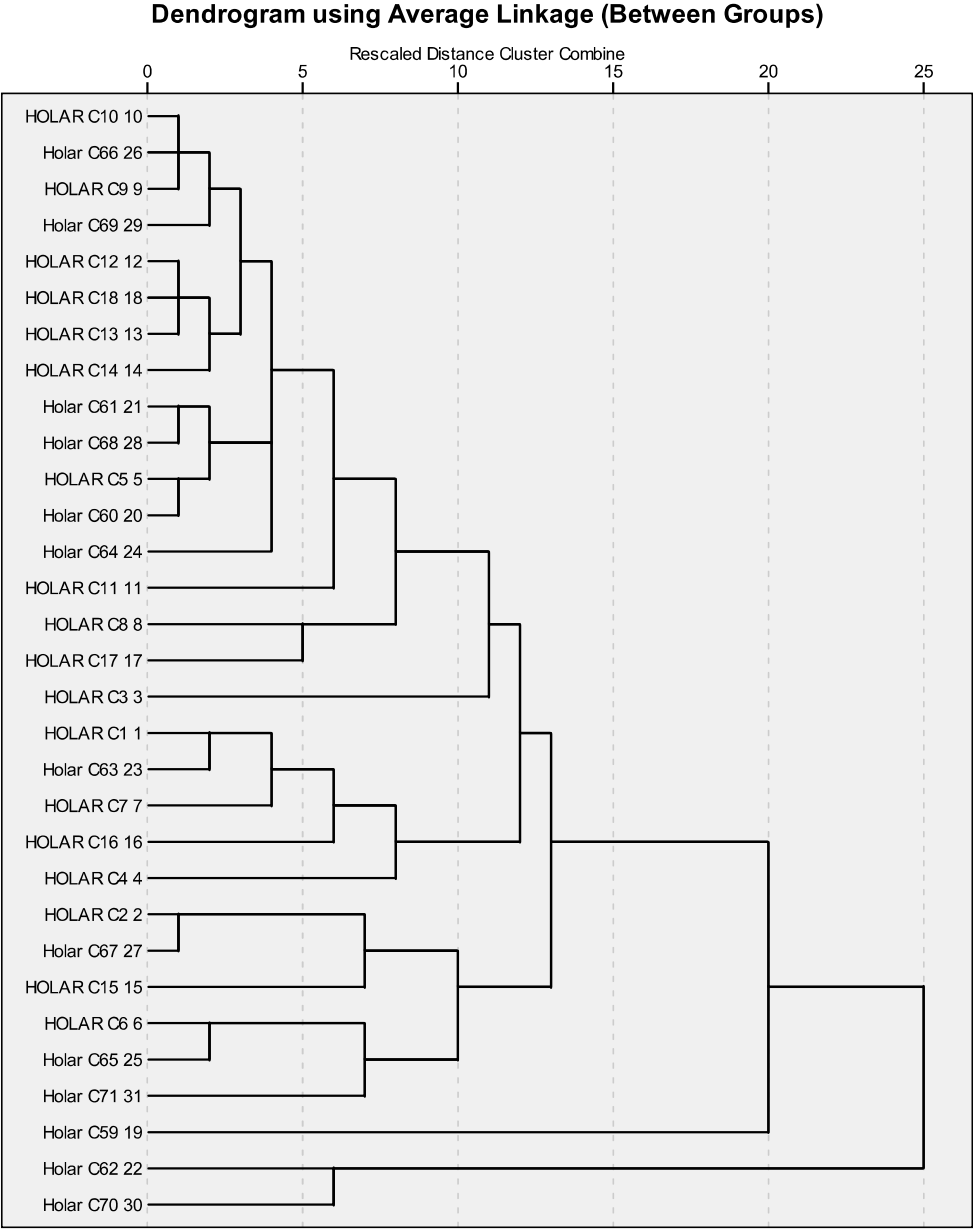


Figure 5.7 –Dendrogram of the extended analysis. The information about the clay pipes from Hólar can be found in table 5.6 above (Brorsson 2010).

There are three distinguishable workshops from which one could not be further identified. It was not possible to divide the last workshop in the following table between the father and son (see table 5.8). Therefore both production times have been unified as one time

span, yet it has a rather narrow time frame of 31 years but should still give sufficient dates for the Hólar collection.

Location	Maker/management	Dating	Total number of fragments
Copenhagen	Alexander Ross & Severin Ferslew	1758 – ca. 1764	14
Copenhagen	Grocer’s Guild factory -under management of J.C. Rømer	1764 –1769	3
Stubbekøbing – Falster Island	D.C. Rasmussen Smidt and son, J. Christianssøn Smidt	1767 – ca. 1798	5

Table 5.8: Overview of all the Danish workshops represented in the Hólar collection with the managers/owners of the production, the time of operation and the amount of fragments found in Hólar.

As it can easily be seen in table 5.8 above, most Danish products originate from the workshop of Ross and Ferslew. It was only in use for six years, yet 14 fragments with their names were unearthed. From the other two production sites much less was found.

Based on typological analyses more possible Danish products could be defined (see table 5.9 below). Even the unmarked Danish products from Stubbekøbing were identified on the basis of typology and ICP analyses. These include both stem and bowl fragments which were mainly covered with ribs and show a spur, sometimes a mere spike for a heel¹⁰⁷. The ribs only reach to about half of the height of the bowl. They end, as far as it was possible to observe, in decorative bands around the stem. The rather peculiar characteristic was the yellowish fired clay. In the break of the clay are frequent brown and rather large dirt particles which could be observed with the naked eye. Having defined this as a Danish group, ICP analyses were used to determine the particles in the clay.

¹⁰⁷ The fragments look like Ahlefeldt-Laurig 1980, p. 242 fig. 83. Based on this drawing the “yellowish colour” as well as the description of the Stubbekøbing products at top of p. 228, the clay pipes found in Hólar were linked to these.

Colour of fired clay	Total number of fragments
Yellowish	17
White	9

Table 5.9: Distribution of the colour of the clay in Danish products.

As it turns out, the iron content of the clay is much higher than that in the other white-firing clays tested from Dutch, English and even other Danish products. The brown distinct dirt particles suggest iron inclusions in the clay. These also explain the explicit yellowish colour of the fired clay.

Since the vast majority of the clay tobacco pipes are white or show a slight greyish hue, this yellowish clay might point to the fact that the workshop Stubbekøbing was using local clay for production.

5.4 Quality

The analysis of quality is a controversial topic. It has been tried to establish guidelines by which the clay tobacco pipes could be categorised and in doing so define the various types mentioned in the written sources¹⁰⁸. This was tried mainly in the 1980s but has not really come to a result and was therefore dismissed in clay pipe research¹⁰⁹.

Nevertheless in this master thesis it is attempted. The reason is that while studying the pipe fragments obvious differences could be seen. The author, however, is aware that the categories defined by her are subjective. Yet the decision to which quality group a clay pipe belongs has been made by using the criteria explained above. Therefore the assessment should be more qualitative than quantitative. The author wants to make very clear that she has not tried to match the archaeological categories defined by her to the ones found in documentary sources, which are named above¹¹⁰.

This is a first attempt to offer criteria for the definition the quality groups. Most likely that cannot offer clear definitions at this stage let alone any guidelines for other researches! However, the idea is tested in this thesis.

After having recorded various aspects of the surface treatment and production methods, no clear rule can be established to clearly define each proposed quality group: very good, good, middle and poor. There are, however, clear differences visible between qualities.

¹⁰⁸ Duco 1981, p. 375 and p. 384.

¹⁰⁹ Private e-mail correspondance with Natascha Mehler 2011.

¹¹⁰ The „groffe“, the „fijne“ and the „porceleine“ quality are known from the documentary sources.

Further indicators for quality are the colour of the clay, the surface treatment, how well decorations are applied -if present, the overall shape of the fragment and how well the clay pipes have been fired.

If a fragment is polished and decorated it is a better quality than a plain clay pipe with a smoothed surface, since it took more time and was made by skilled workers.

There is a significant number of fragments which could not be grouped to either quality category, a total of 39%. The main reason is that the fragments were in no representative size to decide on the original quality of the pipe. Therefore most fragments that are below 1.0 cm of length or height as well as the majority of the fragments that emerged from flotation have been considered too small and therefore do not add to the data. These are mainly flakes from the surface of a clay pipe of tiny fractions. Some of them do not even weigh one gram and have therefore been excluded from the question about quality.

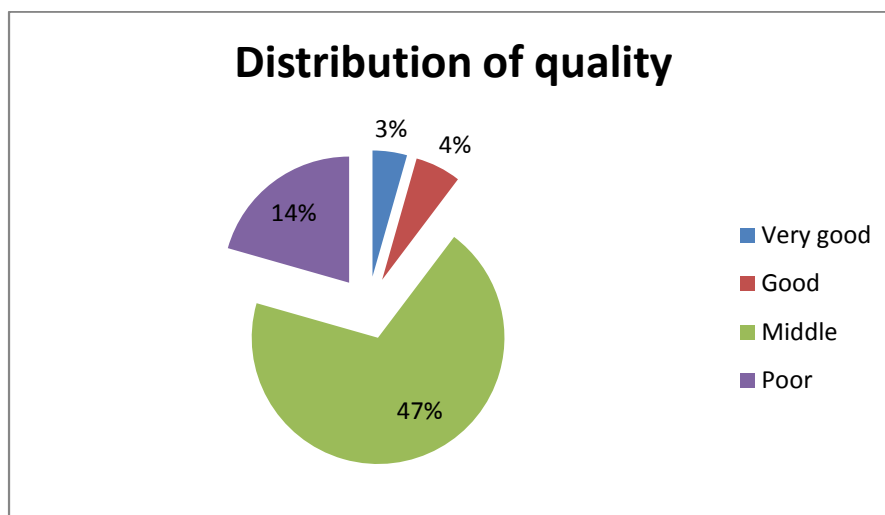


Figure 5.10: Distribution in percentages of the four quality groups.

The greyish clay mentioned earlier is usually accompanied by a polished surface, a rather thin and regular stem diameter and overall shape and very hard fired clay¹¹¹.

The yellowish clay that belongs to the Danish Stubbekøbing is a coarse clay (see figure 5.11 -top) and the pipes made from usually show carelessly executed decorations. Therefore these clay pipes are of a lesser quality.

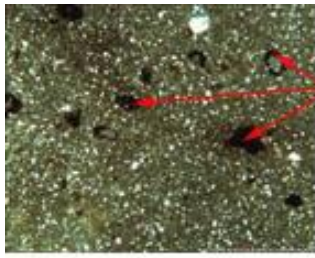
¹¹¹ Brorrson 2010.

Other than that the colour of the surface does not seem to be an indicator of quality. Even though the vast majority of the clay pipe fragments are white and greyish, some fragments, mostly stem fragments, are black all the way through. These black clay pipes do not appear to be the product of firing errors but seemed to be intended to look that way. Under a reduced firing atmosphere the clay turned evenly black rather than white. Yet the surface of these clay pipe fragments is variously well polished and the overall shape of these fragments is very regular and elegant. Other than the fact that they are black, these fragments look very similar to the greyish pipes of good quality, which are presumed to be a product of The Netherlands.

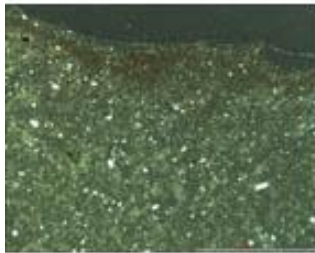
Only one bowl of a reddish colour was found in Hólar in 2008. The surface of this bowl was good/well polished and the stamp and the mark on side of the spur are very detailed cut and imprinted. The overall shape is elegant and the clay very evenly reddish fired. Along with the ICP analyses it turned out to be a very good quality with an extra effort being taken in the making and the finish.¹¹²

The thickness of stem fragments alone, however, was not necessarily a sign of quality. The majority of stems are thicker at the bowl-stem juncture than at the mouth-end. Furthermore the diameter of the stem at the bowl-stem juncture is often oval due to the change of shape.

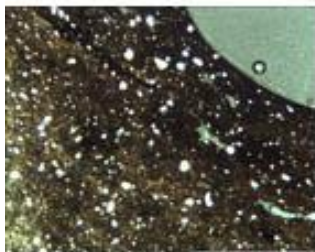
¹¹² Brorsson in a private e-mail conversation.



C59. Danish pipe. Fine clay without any added temper.
Coarser clay than C88 and C89.
Lots of Iron in the clay



C88. Gouda pipe. Fine clay without any added temper.
Very fine clay. The clay has melted in the smaller fractions.
It has been fired to higher temperatures than the others.



C89. Most likely a Dutch pipe. Fine clay without any added temper.
Coarser clay than C88 but finer than C59.
This pipe was fired to lower temperatures than C88.

Figure 5.11: Thin sections taken of a Danish pipe from Stubbekøbing with yellowish clay (top); a hard fired greyish clay pipe of Dutch origin (middle) and another Dutch pipe of an earlier making (bottom)

After having studied many undecorated stem fragments it also became clear that the thickness of the stem and the degree of how hard the clay was fired seem closely related. A very thick stem, about 1 cm and slightly more, showing soft clay, were not polished. Either the clay pipes were made that way or a possible polish had been abraded during the years. With the help of the ICP analyses it turned out to be very similar clay like the greyish Dutch products. Using the unprecedented method of thin sections for the study of clay tobacco pipes, results show up clearly. The very thick stem fragments, with softly fired clay show in the sections that single components of the clay are visible as squares (figure 5.11 –bottom). The thin section of a greyish, hard fired fragment however, show all the components of the clay are melted together (figure 5.11 –middle). This picture equals thin sections taken from stoneware pottery. Therefore, it proves that a change in the firing techniques has taken place over time rather than a difference in quality. This sheds light on a chronological difference between the clay pipe fragments as well. Different ovens and kilns had to be built and

developed to reach the higher temperatures needed to melt all the particles of the clay together as seen in figure 5. 11 in the middle. This resulted in the greyish, hard fired clay dominating the Hólar collection. Due to better firing techniques it was then also possible to make these well known elegant clay pipes with longer stems. If thin stem diameter are found in connection with soft fired clay they might indicate a lesser quality.

Unfortunately there does not seem to be a clear spatial distribution pattern evident for the different quality groups yet.

5.5 Usage

Almost all of the clay tobacco pipe fragments in Hólar show some signs of use¹¹³. Most of the material shows simply smoking stains with the bowls containing soot inside and also often outside the bowl. These wear marks are mainly rather clear visibly and some are very prominent. These might indicate a rather long use of the clay pipes. About 5% of stem fragments also show teeth-marks. These occur on original mouthpieces as well as on fragments which were used after part of the stem had been broken off¹¹⁴.

In total there are 114 pipe fragments that show some kind of use after having been broken. Some fragments also present traces of having been used after part of the bowl had been broken off. These usually take the form of smoothed and rounded edges forming a new rim and are very rare.

The overall impression is therefore that most pipes were used for a longer time, due to very pronounced smoking stains and occasionally the usage after breakage.

On 36 fragments some kind of re-use from the original pipe can be deduced. There are no whistles in Hólar, which would mean that holes would have been drilled into the stem of the clay pipes. There are, however, few beads. Here the stem was carefully cut off around some geometric pattern. In the stem a cylindrical carving was then made. It got narrower and deeper towards the bore. This might suggest the reuse as a bead or a light weight or just a decoration for textiles or jewellery.

¹¹³ A total of 97% of the fragments from Hólar show identifiable use marks or are rather certainly unused. Only about 3% could no statement about the usage be made.

¹¹⁴ The numbers are as follows: from a total of 167 fragments with teeth marks are 56% found on stem fragments suggesting original mouth pieces. While the other 44% of teeth marks are found on fragments which were continued to be used after breaking. These numbers cannot be correct as the originally fashioned mouth pieces have not been recorded from the beginning of the analysis. See chapter four about the collection of data.

In all other cases it seems much more likely, however, that this carving shows repairing. Some fragments are carved into the stem, others will have been cut thinner, almost made pointy, so these pieces can be fitted together. The two stem fragments will then have been jointed and somehow bound or glued together.

The small amount of precisely 3% from the complete Hólar collection was considered to be unused. These 77 fragments need to be viewed in a critical light. It is not possible to distinguish between a pipe that was only smoked once or twice and an unused pipe. The indicator for unused pipes is the absence of smoking stains and/or soot inside. Used clay pipes normally show a differing intensity of smoking stains, which can even penetrate the surface and make the pipe look dark brown.

Unfortunately no closer look was taken into the intensity of the use patterns itself. Comments like “clay pipe has been long in use” or “heavily smoked” might occur in the database but no aim was made yet to define and establish criteria to offer a categorisation at this point. So far it was only distinguished between used, unused, used after breakage and reuse.

There are only 6 fragments that show some secondary usage like abrasion and trowel marks. These have been caused when the fragment came to rest in the ground or while excavating it and are therefore not considered as originally used. This number seems unrealistically small, as trowel marks occur often¹¹⁵. This should be attributed to the former lack of experience of the author and was only recognised towards the end of the analysis. But be that as it may, this particular survey does not have any particular impact for the analyses of the clay pipes from Hólar.

5.6 Distribution

The excavation area of Hólar consists mainly of three larger areas which were the focus of the research work¹¹⁶. The clay pipe material from the two smallest areas¹¹⁷ and test trenches is not included in this study. Area F is the smaller research area and was excavated during two work seasons. Extensive work in this section was done in 2009. Thereby the bishop’s residence dating back to 1587 has been found. The house was made from red bricks and wood, a construction known as half-timbered. Area E is somewhat larger in size than area F. Under extensive medieval midden layers a building interpreted as the bishop’s feasting hall

¹¹⁵ Trowel marks occur rather often in the Skálholt collection. Exact percentages are not available at the moment of this thesis as the analysis of the material is still ongoing.

¹¹⁶ Encounters 2009, pp. 30-33.

¹¹⁷ The areas are A and B and being excluded from this thesis.

was unearthed. It was covered in later times by vast amounts of waste heaps in which clay tobacco pipes were found. The by far the largest excavation area, however, is area D with its various turf houses and structures, including the printing house, a smithy, kitchen, working places as well as a *stofa*. Clay tobacco pipe fragments were found in all three areas with the highest concentration in area D.

At this point it should be mentioned that there occurs a problem with the maps of distribution. As mentioned in chapter four, the GIS data collected in the field comes from the total station. Thereby in an ideal case each find will be measured as one point. Due to the sheer amount of all kinds of finds, altogether more than 300,000 objects, finds from mixed and topsoil layers, only very sporadically got a measure point of the total station. Since more than half of the clay tobacco pipes are from such mixed top soil layers many were not measured and if not measured they will not show up in the distribution maps.

One of the main top soil layers in Hólar is layer [50]. This spacious layer is a very mixed top soil layer with thousands of finds which cannot be connected to specific structures. It covered almost the entire area D and at a later time when area D was extended, more top soil layers with the same attributes were measured to be connected to layer [50]. A total of 1,943 clay pipe fragments have been found in layer [50] which makes almost 60% of all the clay pipes from Hólar. Unfortunately these clay pipes will have to speak for themselves as they cannot shed any detailed light on specific houses or structures in area D. They are, however, not to be dismissed by this circumstance.

Since area E consists mainly of midden layers, however, no structural context related to the 16th, 17th or 18th century at the height of the clay pipe use, can be seen. Therefore a count of clay pipe fragments should suffice here. The bishop's feasting hall precedes the time in which clay tobacco pipes were in use and is thus of no concern for this thesis. In area F the situation is slightly different. Due to the work of only one season of extended excavations and many mixed¹¹⁸ layers with a huge amount of various finds, not many clay tobacco pipes were measured with the total station.

The collection of clay pipes from layer [50], and other top soil layers for this, should not to be disregarded though. There are significant finds which can still help us to understand the economic and social situation in the 17th and 18th century of the Episcopal See. There are

¹¹⁸ The mixed layers in area F originate mainly from the school of agriculture which was situated in Hólar in the 19th century. Thereby pupils were taught to use a bulldozer and the ground around Hólar was levelled. In this procedure most structures and layers in area F were mixed together.

for instance two stem fragments¹¹⁹, mentioned above, which show an early, floral decoration on the top of the stem dating between 1625 and 1650. Both pieces have been found in area D, one in layer [50] and the other was unearthed in another top soil layer [88590] in the south-west. This layer has the same characteristics like [50] and is considered the same just in the south-west part of area D. These fragments are made from exactly the same mould. Therefore it seems highly likely that these pipes were imported at the same time and from the same trade source. Yet another interesting find from the same layer is a smoking pipe fragment made from porcelain. Unfortunately, also the only complete clay pipe¹²⁰ found in Hólar comes from layer [50].

Even though not all of the clay tobacco pipe fragments found in area D were measured, the ones that were recorded by the total station show certain distribution patterns. There are also some scattered clay pipes to the East of the houses/structures in area D. These are some clay pipes which have been sporadically recorded by the total station and belong to layer [50]. The majority of the clay pipes are found inside the houses and structures. A concentration can be seen in the *stofa* (house 8), a fair amount of pipes are also preserved in the kitchen (house 6), the pantry (house 9) and the corridors between these rooms. Another accumulation can be found in house 7. House 7 was most likely a working place and its use and function might seem to have varied at different times in the past. Vast amounts of textiles and leather were unearthed in house 7 as well as clay tobacco pipes.

Fewer clay pipe fragments, with a total of 57, were found in the print house and only 34 clay pipes were recovered from the smithy (house 12).

As mentioned above, the longest and most complete clay pipes were found closest to the turf walls. This phenomenon is to be expected since people would mainly walk and work in the middle of the rooms rather than directly along the walls.

The distribution of stems and bowls seems to show only slight patterns.

Concerning that the vast majority of clay pipes found, are stem fragments it is not surprising to find them all over the excavation site matching the general distribution. The bowls, however, seem to present a rather more significant pattern. Some bowls are found in the *stofa* (house 8) but the majority of them come from house 7. No further distinction can be made since there are no patterns to suggest that bowls were mainly found at one side of the

¹¹⁹ The find numbers given in Inrasis are **1722** and **12459** –two stem fragments from an identical mould.

¹²⁰ The only complete clay pipe has the find number **3300** in intrasis.

house, along the walls or in any other specific place. This is suggestive, however, as another find category unearthed in house 7 are textiles¹²¹. The higher amount of bowl fragments may therefore indicate a possible reuse as thimbles. The remaining few bowls are found scattered around the site.

As mentioned above, more than half of the clay pipes found are from the disturbed top soil layer [50]. Leaving this observation aside and now taking only the measured pipes into account, slightly more clay pipes have been found inside houses than outside of them. The numbers being 22% come from inside the structures while 19% are found between and around various houses¹²². Almost equal amounts of clay pipes are found in the houses 7 and 8, the workplace and the *stofa*¹²³.

In the *stofa*, house 8, a total of 253 clay pipe fragments have been found. Again, it is not surprising to find almost 80% plain stem fragments and about 18% bowl fragments in this accumulation. More importantly there are 4 complete bowls as well as two functionally complete pipes. Two of these bowls can be dated to the second half of the 17th century. The remaining two bowls date into the 18th century, while it was possible to be more specific for one of them to date it as belonging into the first third of the 18th century. The functionally complete pipes date to the latter half of the 17th century and to the early 18th century. Both came from the same floor layer [65526] as well as the bowl from the first third of the 18th century.

This floor is significant since it holds most of the clay pipes found in the *stofa*. Altogether 120 clay pipes and fragments were found in this floor.

From the total of 253 pipes found in house 8 a mere 44 could be dated.

The *stofa* was a very rich place for various finds. A total of 1,352 objects are recorded from house 8 alone. There are objects like leather shoes, vast amounts of textiles, lots of glass, ceramics and other find categories. However, there are merely 316 datable finds in this assemblage, including the 44 clay pipes. All the dates come from ceramics and have a time span that stretches far too long to help in dating the remaining clay pipes.

¹²¹ There is another master's thesis done by Þuríður E. Harðardóttir on textiles from house 7 at present.

¹²² The 22% from inside the houses are 746 pieces in total, while the 19% from outside the structures represent 632 fragments.

¹²³ *Stofa* in this house/context can be understood as a living room.

6 Conclusions

This last chapter has been split into two parts. The first to sum up and discuss the results derived from the empirical analyses done on the Hólar material. Here the still due concluding interpretations shall be drawn. The latter part will give a prospect what else should be done in future works in the clay pipe research in Iceland.

6.1 Part 1 –*Interpretative issues*

6.1.1 Dating

As shown above, the first clay tobacco pipes start appearing in Hólar in the late 16th century and are at the height of their use in the first half of the 18th century. This observation is not surprising as it follows the development and production pattern in Europe. Knowing the problem with dating small clay pipe fragments, especially when unmarked and undecorated, there seems to be an emphasis in the first half and around the middle of the 17th century (see table 5.3). This is represented in 66 fragments, while the second half shows a much lower number with a mere 18 fragments. This could be an underrepresentation due to the difficulty of narrowing down dates to the latter 17th century as production workshops that opened in the latter 17th century could run for a long time. It could also show a decline in the clay pipe supply at that time, which is unlikely, however, as the production of clay pipes is steadily climbing to its height. Furthermore there is also the problem with the largest group which is labelled “post 1650”. This group outnumbers all other subdivisions from the 17th century with 321 fragments. This *terminus post quem* is based on the decorations of bands and circles which start occurring around 1650. It is not possible to say for sure how long it dates to as this seems to be a style of decoration which was used for a long time, possibly until the end of the 18th or 19th century. The 18th century on the other hand shows a clearer picture. While the majority of pipes were used in the first half and up to past the middle of the 18th century a clear decline is seen in the second half of this century (see table 5.4). A clear 135 fragments from the earlier part in comparison to a mere 16 fragments from the second half of the 18th century seem to show a very clear decrease. It has to be said, however, that the clay tobacco pipes had their peak in the 18th century. This is clearly definable with the fact that the firing techniques during the production of the clay pipes changed in the 18th century and therefore stem diameters got thinner and bowls bigger and the production of clay tobacco pipes was stronger than ever. The author has picked up on these changes in production towards the end of the stage of analysing. The phrase found in the database “good/hard fired clay” occurs therefore only with some clay pipes, as the knowledge and comprehension of the author grew. This simple statement indicates that the clay was fired with the reformed technologies from

the 18th century. That only gives a very vague date or rather a *terminus post quem* meaning these pipes date from the 18th century onwards. As this was not picked up in the analyses from the beginning, the information is rather incomplete. That is also one of the reasons why there are only 16 fragments dated to the second half of the 18th century which would suggest a distinct drop in the use or import of the clay pipes. That is, however, expected to be a false statement. The vast majority must have been produced in the 18th century and will not have suddenly dropped to these numbers. That is a result of the author's in-expertise at the beginning of this project and can be rejected as she is doing continuous research on clay pipes in Iceland at present and this statement will not hold. As the earlier mentioned collection of clay pipes from Skálholt is in many ways comparable with the collection from Hólar, no drop in numbers towards the end of the 18th century is recognisable, instead there seems to be an increase.

The few clay pipes that are either found to be from the 17th to the 19th century as well as the two groups possibly having a time span of around 100 years¹²⁴ need to be viewed critically. These dates are most likely attributed to the in-expertise of the author as well as to narrow down the time span.

6.1.2 Origin

The vast majority of the clay tobacco pipes found in Hólar have their origin in The Netherlands. Of the less than 300 fragments which could be identified with certainty, 77% are of Dutch origin. It is more than likely, however, that this number still represents the distribution for the complete collection correctly. The workshops are mainly situated around the most important production centre at the time, namely Gouda. Other production sites occur in the collection as well, like the few clay pipes from Amsterdam and possibly other Dutch sites. These workshops were highly specialized and worked with great efficiency to produce one of the world's first mass-production. The manufacture of clay tobacco pipes was so well established, that products were adapted to suit other local markets (i.e. North America – special “Indian shaped pipe”; Denmark – themes for the Danish-Norwegian kingdom/Coats of Arms/pictures/etc¹²⁵). Therefore it is common to find Dutch products spread more or less over the whole known world at that time.

Another important source for clay tobacco pipes usually was England. The production had a slight head start in comparison to the one on the European mainland. Workshops there were more spread out over London and other parts of the country than if it were in The

¹²⁴ Meant are the time frames called “17th – 18th century” and “18th – 19th century”.

¹²⁵ Duco 1981; Ahlefeldt-Laurvig 1980.

Netherlands. Nevertheless, English pipes are just as widely spread as the Dutch counterparts. In the Hólar collection there do not seem to be many English products, a mere 6% of the identifiable fragments. This is likely due to a couple of reasons (see the discussion below).

Compared to these two main production sites, it might seem rather surprising that the Hólar material has a rather prominent fraction of 17% of Danish clay pipe products. The production sites in Denmark are spread over the country, including various islands. The workshops themselves were normally in use for five to ten, maybe even twenty and in rare cases up to almost forty years.¹²⁶ It is known that these short-lived and small scale productions could not cover even the demand in the home country. Dutch clay pipes were found in Denmark, and some were even specially designed for the Danish market. Yet there is a certain amount of local Danish products found in Iceland, which belonged to the Danish kingdom at the time. This should be explained mainly by the Danish trade monopoly from 1602 till 1874. The monopoly was not just put on “luxury goods” like clay tobacco pipes, but on all trade. Also it seemed sensible for the Danish king who wanted to impress his power in this way that the clay pipes would bear the names of the Danish manufacturers. From the altogether thirty or so Danish workshops covering a total time frame from 1611 to around 1860, a peak in manufacture occurs from after 1750 to around 1800. There are only three workshops presented in the Hólar material (see chapter 5 table 5.8). Two sites from Copenhagen and one from the Falster Island were identified. How or who chose these particular workshops for the export to Iceland is unknown. It is clear, however, that the manufacture located in Stubbekøbing, run by Rasmussen Smidt and later his son Christianssøn Smidt, is not just widely spread over all the Danish kingdom, but products have been found as far as Greenland and the Gold Coast of Africa¹²⁷.

At least some of the products from the Stubbekøbing production site are clay pipes which are easy to distinguish from any other workshop, even without stamps and their like. The significant colour and composition of the clay are clearly visible even without the use of ICP analyses. Already Ahlefeldt-Laurvig noted in 1980 that the pipes are “being rather red in colour instead of white”¹²⁸. Ahlefeldt-Laurvig does not give any reason for the recognisable colour or a closer description, nor does he seem to speculate about its origin. Furthermore the phrase of stating the clay pipes “being rather red in colour” might suggest to the author of this thesis to possibly stretch this colour spectrum a little further. This observation of the peculiar

¹²⁶ Ahlefeldt-Laurvig 1980, pp. 249-250.

¹²⁷ Ahlefeldt-Laurvig 1980, p. 225.

¹²⁸ Ahlefeldt-Laurvig 1980, p. 228.

colour as well as the drawings¹²⁹ presented by Ahlefeldt-Laurvig fit the fragments of yellowish coloured clay pipes found in Hólar. On this basis the author of this thesis has connected them to be the same artefact group. There are, however, a few reddish examples as well as some white kaolin tobacco pipes from the Danish production site of Stubbekøbing. What influences these colours are the “brownish dirt particles”¹³⁰ which are visible to the naked eye. With the help of ICP analyses it became clear that the “brown spots” are rich in iron. Therefore this clay shows an altogether much higher iron content than the clays used for pipe production in The Netherlands and England. This might suggest the use of local Danish clay or at least a mixture of a fine (local or imported) clay and clay with high iron content. The finishing of these pipes is usually rather poor and crudely done. They are very rarely polished and the decoration tends to be rather irregularly applied. The overall shape seems more or less the same in every pipe fragment found, which was also observed by Ahlefeldt-Laurvig¹³¹. The majority of these pipes unearthed in Hólar are covered with flutes/ribbons and very easy to identify.

6.1.3 Quality

There are strong indicators visible to all observers of clay pipes which point to either better or lesser qualities in general. These are mainly to do with the finish of the pipe. If for instance the mould lines are completely removed, the surface is trimmed and polished and the stem diameter rather regular and thin (which usually means around 0.7 cm and below) then this pipe was produced with some care and was well done. In case of decorations and stamps, criteria like how detailed a pattern or stamp is, whether it is regularly applied or going unintentionally diagonal around the stem with a certain amount of overlapping pattern, or if it is barely imprinted so it is hard to see at all, help to make the decision as to the quality.

One aspect does not seem to make any difference whatsoever. Only by the colour of a clay pipe fragment, whether it is white, greyish or black, one cannot necessarily define a quality. Due to the change in firing techniques, it seems that earlier pipes are more white, sometimes even described as a blue-greyish¹³² sheen, rather than the latter productions which show a clear even darker grey hue. A mere 0.6% of the clay tobacco pipes recovered in Hólar are totally black, inside and out. With the help of ICP analyses it was found out that the clay is the same as the white and grey counterparts. Therefore it is possible that some of these fragments are secondary burnt in domestic fires or could also be wasters/products with firing

¹²⁹ Ahlefeldt-Laurvig 1980, p. 228 and fig. 83 (p. 242).

¹³⁰ Phrased as such by the author of this theses while analyzing the clay pipe material.

¹³¹ Ahlefeldt-Laurvig 1980, p. 228.

¹³² Duco 1981, p. 373.

errors. Some of the black clay pipe fragments are of a very even black colour without spots of white or grey. Furthermore the surface was carefully finished, partly even polished which is the same as the white clay pipes. This observation therefore would suggest that these clay pipes were intentionally fired in a reduced atmosphere as to turn the clay black.

On the subject of quality it needs to be said again, that this approach was a more experimental one. The author has not tried to connect the quality types found in the archaeological material to the ones mentioned in the written sources. Therefore different terms have been chosen like poor; middle; good and very good, and a row of criteria has been assigned to each quality group. This idea is not at all new, as other clay pipe researchers use phrases like “good quality pipe”¹³³, “lower quality product”¹³⁴, “clay pipes [...]of far better quality”¹³⁵ or “the majority [of pipes] are poorer”¹³⁶, which show there are clear differences in the quality of clay tobacco pipes. This thesis has made an attempt to identify and establish certain criteria (i.e. finishing, production marks, etc) to define the quality of each tobacco pipe. With the help of a combination of various criteria one of the four quality categories from above was chosen. Even though value has been tried to apply to achieve statistical data, this is not a “foolproof” method, as it also relies on the knowledge and “feeling” of the person analysing the clay pipes, but fortunately not merely that. It was not yet possible to produce a kind of full catalogue of criteria to define what makes for example a “good” clay pipe and why are some classified as “poor”. However, the author is convinced that more focused studies in the future will be able to define criteria to help answer such questions and even give the quality groups less judgemental names.

One interesting idea occurred too late to be checked in this thesis. Due to the growing knowledge of the author on the subject of the material towards the end it was too late to add more fields to the database. This was not possible as too much material had already been analysed when the lack occurred to the author and going back over the former material would have taken up too much time. In collecting data, therefore, one aspect is blurred and cannot be quickly reconstructed. Marks on the site of the heels with the capital “S” above the Coat of Arms of Gouda were not put in a separate field in the mask of the database. Therefore it is at this moment not possible to see how the quality categories with its criteria defined by the author compare to the European mainland standard. Dutch products wearing the “S” are marked in that way as “slegte” quality, lesser quality. Further research therefore should

¹³³ Duco, 1981, p. 453 nr. 19.

¹³⁴ Duco, 1981, p. 453 nr. 27 and 28.

¹³⁵ Mehler mercantilism 2009, p. 276.

¹³⁶ Ahlefeldt-Laurvig 1980, p. 228.

definitely study whether a quality marked as a minor product in The Netherlands would fall in the category of a very good quality in Iceland. The results to this question would open up a discussion about what kind of quality from the mainland is brought to a remote place like Iceland and what the stand of these products would be here compared to Europe.

That this may be of interest for further studies also suggests the request sent by Bishop Brynjólfur in 1675. There he asks to be sent “as many and good pipes as possible”¹³⁷. This shows that to some degree there was an awareness of the quality available in Europe known to the people in remote Iceland. If that only includes persons of a higher social standing cannot be said at present.

6.1.4 Usage

As the results clearly show, almost all of the clay tobacco pipes found in Hólar were used compared to the 3% which were probably not smoked. This small amount of mainly unused stem fragments and little bowl percentage could make some explanations. One is the question of identification as discussed above. If, for instance, a clay pipe was only in use briefly, the tobacco juice might not have soaked into the clay. It would, however, not be totally surprising to find some small amount of unused clay pipes on a site the size of Hólar. Clay pipes were usually transported in crates to the customers. In case of the Bishop’s see in Hólar, the clay pipes first had to cross a vast distance on a ship before being transported along bumpy roads. During this process it can be expected that some degree of loss would occur. Other ideas are possible, like someone keeping a spare, new clay pipe for a later time.

Most of the clay pipes show signs of having been used. The degree of usage varies but the majority suggests that the pipes were used more than once or twice. This is an assumption, as there is no information as to how often clay pipes were smoked in Iceland compared to the mainland. This assumption is based on the intensity of the staining on the stems and bowls.

Used pipes in common are simply detectable by the clear presence of smoking stains visible in the break of the stems as well as in the base of the bowl. They take the form of a greyish to brown ring around the bore which is caused by the tobacco juice and smoke going through the stem. The usage of the bowls is equally simple to see as the bowls often show the same smoking stains as in the stem, as well as discolouration from soot almost always inside and sometimes outside the bowl. On some of the fragments clear traces of continued use after the clay pipe was partly broken were detectable. This mainly takes the form of teeth marks

¹³⁷ Hallgrímsdóttir 1993, p. 133. In Icelandic: “[...] en pípurnar þigg eg gjarna sem flestar og beztar“ (from: Bréfabók Brynjólfs biskups 796-797.) [author’s emphasis].

and rounded edges at the broken stem end in order to fashion a new mouth piece. In one instance a stem was found with bark wrapped around the end of the stem. This could suggest a sort of repair to make a new mouth piece. However, this is unconfirmed as the bark would be rough and might hurt the lips of the smoker. On the bowls of the pipes the usage after breaking is identified by the broken edges around the rim. They were usually rounded and the soot from the continued use covers the newly fashioned rim. This is, however, a very rare phenomenon and occurs only twice in the Hólar collection.

Even though the number of clay pipes which were used after breaking is rather small, but in connection with the indications of a longer time in use, it shows clearly that clay pipes in Hólar were not a common commodity but rather something that might have been hard to come by in certain times. It may also be noted here, that it is likely that not all fragments with signs of use after breaking are recorded. This is due to the author starting with the analyses not having the knowledge of how these signs of use after breaking looked like. Furthermore, the change in the firing technique in the 18th century made the clay exceptionally hard that sometimes it is hardly possible to see even teeth marks on the original manufactured mouth piece let alone a newly fashioned one after it had broken off. Lastly another factor to complicate this observation is the abrasion from the soil while the clay pipe was in the ground. Surfaces could have been partly taken off including traces of a secondary use after breaking.

If the clay pipe was broken beyond a simple repair, like carving a new mouth piece, some other way of repair was needed. On some of the stems this takes the form of carving inwards towards the bore in a diagonal fashion. This can occur at one end of the stem or at both. Since there are less than 40 fragments with this phenomenon and varying degrees of intensity of this carving, no certainty can be gained at that point of research. It seems likely, however, that some stems are curved towards the bore, while other stem fragments are sharpened due to taking off the surface of the stem. In doing so, it is possible to insert the pointed end into the carved end of a stem and so create a longer stem. The two pieces needed to be kept together, either by binding them or gluing the fragments together. This seems to be a likely theory at the present state, as similar carvings are found by author on the Skálholt collection. However, further analyses needs to be done to confirm this idea.

It should be mentioned again, that there is no information on how often a clay pipe could be used or was smoked before it was discarded or was unable to use any further. It is also uncertain that any amount of deeper studies were conducted on that matter, as in most places

in Europe, clay pipes were easily accessible and could be replaced quickly due to mass-production. In some pubs documented sources state that clay pipes were sold pre-filled and technically could be thrown away afterwards.

It is clear that in Hólar end-consumers enjoyed smoking clay tobacco pipes but the amount of long used pipes, even after the original product was partly broken, hints that clay pipes might not have been too easy to come by or at least were not always available on demand. Whether that fact means clay pipes represent a luxury item is not meant to be stated here. Also the cause of this scarcity has not been looked at so far. Was it because of the Danish trade monopoly? Did other factors disturb the trade with Iceland? These questions would be interesting to research in further works.

When it was finally impossible to continue using the clay tobacco pipe for smoking some kinds of re-use can be seen. In one case the band decoration of a stem was carefully cut off on both ends and the edges were smoothed. This suggests that at least this piece could have been reused as a bead to be used in textile work or as part of a piece of jewellery. Another possible re-use is connected to the next paragraph and shall be presented there.

6.1.5 Distribution

As mentioned above, the distribution is rather difficult. About half of the whole clay pipe collection from Hólar comes from disturbed and topsoil layers. These can give only limited information about the distribution due to the many times they were moved and bulldozed. There are, however, 1,377 clay pipes left out of a total of 3,333, which could be connected to various layers. These ratio are 54% belonging to different houses/structures while the remaining 46% of clay tobacco pipes are found outside the houses. House 7, which was a work shop with different functions and uses at various times, has the highest amount of clay tobacco pipes of all the houses, with a total of 21% found inside a house/structure. House 8, the *stofa*, shows still 14% while the remaining houses have clay pipes in varying amounts but all below 5%.

While the distribution of stem fragments did not yield any results, the distribution of bowls gives a clearer pattern. While some bowl fragments are found scattered around the site, the majority were recovered from house 7, the workshop. In house 7, large amounts of textiles were found amongst a wide variety of other find categories such as leather and others. As these textiles are investigated in another master's thesis at the time of this paper, it is too early to draw conclusions. But preliminary results have shown so far, that there are lots textiles

which show proof of sewing¹³⁸. This could be suggestive in connection with the clearly higher ratio of clay pipe bowls and another form of reuse. The bowls from discarded clay tobacco pipes, could have been cut off and then used as a thimble. This, however, is only a theory as traces of needle work were not looked for on clay pipe bowls during the analyses. There are a few bowls that show a smoothed and rounded base with a clearly cut off stem. This will have to be researched closer at a later point and studied closer on other collections.

6.2 Part 2 –Future work/prospects

The problem of identifying the origin of the clay pipes might not be correct in all cases. The seeming lack of English pipes demonstrates this. The author is new to the subject of clay tobacco pipes and was only able to go along the basic works and typologies. Since there is no other clay pipe researcher in Iceland at this point in time, personal instructions and schooling in the finer, more detailed parts of the topic was not possible. It is very likely therefore, that fragments have been given a wrong place of origin, an incorrect date, overlooked or such like. Also it took the author some time to see the difference between “polished”/burnished and merely “smoothed”. Therefore the collection has a far too high number of “polished clay pipes”. This in turn will have resulted in more fragments being of a better quality than they actually are.

The overall impression of the results is not necessarily wrong. For instance, in other collections the lack of English pipes has been noted as well¹³⁹. The dates derived, even if longer time spans are given by this author, will not be very wrong either. The partly missing information about the intensity of use, which has resulted in a low percentage of extensively used pipes, at least give a tendency and hint at what to look for in the next clay pipe analyses.

And even though there are not too many fragments with traces of repair and/or marks of usage after breaking found in the Hólar collection, this topic should be noted briefly. If these signs of repair or any traces of use after breakage occur on clay pipes with datable stamps, inscriptions or on bowls which can give a date due to typological analyses, these clay pipes might present a problem. As the commonly known tools for dating clay pipes, discussed in detail in previous chapters, they merely tell us when the pipes were produced or the time span of their fashion. Furthermore, clay pipes are seen as one of the first mass-produced

¹³⁸ Private conversation with Þuríður Elísa Harðardóttir.

¹³⁹ Mehler 2002, p. 68: From a total of 268 clay pipes found only one fragment could be identified as being English while 14 came from The Netherlands. A similar tendency is beginning to show in the clay pipe assemblage from Skálholt (analysis still in process and done by the author of this thesis).

objects in history and were meant for a short term use. If, therefore, it turns out, that Hólar and other tobacco pipe collections in Iceland show an extensive use of the pipes, either through repeatedly breaking stems and newly fashioned mouth ends or the identified traces of repair with the carving of the stem, then the dates and life spans from the catalogues and typology tables would only give us half the truth. The short time spans preferred by many archaeologists around Iceland to date their sites would have to be extended. As to how much further these dates need to be expanded cannot be said at this point. It became clear during the analyses that some smoking stains were extensive, sometimes even penetrating the surface and discolouring the former white pipe clay dark. This will need further research with possible experimental approaches, to see if there are differences in the capacity of the clay to absorb the tobacco juice and form these smoking strains stains. Other research could look at if there is a dependence on the kind of tobacco that was smoked in Iceland compared to the European mainland. Equally interesting should be the question as to how often/how long clay tobacco pipes were used in places of easy accessibility compared to Iceland. This could shed a light on the situation in Iceland during the monopoly.

Another interesting aspect is to look at other collections. To understand the culture of smoking tobacco clay pipes more fully in Iceland, it would be helpful to look at other collections more closely, like the monastery on Viðey (a small island in front of Reykjavík), Bessastaðir (the seat of the Danish administration), as well as a few farms of different standing (a high status farm like Reykholt versus small/rural farms). The clay pipes from Skálholt are being analysed at the present and will be a good comparison to the Hólar collection. If this were done, the distribution of clay tobacco pipes around the whole country could be traced more fully¹⁴⁰. Further questions might be possible to answer, like where did the Icelandic people in the 17th and 18th century smoke? Is there a difference in accessibility in Iceland? Who smoked, men, women and/or children? Is there a difference in motifs or clay pipe types favoured between sailors (i.e. clay pipes found in harbours, shipwrecks, etc.), farmers, clergymen and their students? Is it even possible to research the last question or is the import of clay pipes just too limited? If the study on quality can be advanced it would be interesting to know if there are social patterns visible similar to the ones described by Loktu¹⁴¹ and Duco above, that poorer and more rural living people would smoke cheaper pipes of less quality. One such cheaper pipe was vividly described by Duco: "[the] Jonah pipes [...belonged] in the 17th century to the worst sort of kitsch and probably that is why they are

¹⁴⁰ Mehler 2003.

¹⁴¹ Loktu 2009.

mainly found in the poorer districts”¹⁴². Or does the quality of clay pipes accessible in Iceland compared to the European mainland even allow such preferences and distinctions?

The author heard about a possible distribution centre for clay tobacco pipes being discovered in the Westfjords¹⁴³, a remote part of Iceland in the North-west. A collection of mostly unused clay pipes supposedly has been found there. This might give further insights as to the economic situation at the time. The question if clay pipes were smuggled into the country during the trade monopoly and to what extent might be illuminating in this context.

Bessastaðir might also yield information as to the authority truly held by the Danish crown on Icelandic ground. If there many finds of Danish products are unearthed, this could present a political theme to impress, enforce and promote the role of the crown.

If there are more Danish clay pipes found in farms around Iceland, would that indicate that these people had no access to the more fancy Dutch products?

More material analyses, concerning the questions of quality and use patterns, in combination with social questions as well as the research in documented sources could help to draw a colourful picture not just of the smoking habits in Iceland but of the Icelanders and their culture during the 17th and 18th century.



Figure 6.1: Fragment of an unused bowl. The pinkish hues on the outside and grey stains in the break suggest a waster. The clay is very soft/porous and is chipping off around the bore hole (photo taken by A. Wacke).

¹⁴² Duco 1981, p. 385

¹⁴³ Ragnar Edvardsson, personal comment.

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8 Appendix

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