KØBENHAVNS MUSEUM/ MUSEUM OF COPENHAGEN/ ARCHAEOLOGICAL REPORT

Kongens Nytorv, KBM 3829

Cultural Historical Report, Metro Cityring Excavation

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Cover picture: The Kongens Nytorv excavation. The eastern gate building looking SW. Photo: Museum of Copenhagen

Foreword

The excavations in connection with the Metro Cityring project have been the largest ever archaeological project in the history of Denmark. The results have provided brand new and extensive knowledge about the history and development of the capital of Copenhagen and the former inhabitants. The excavations at the site of Kongens Nytorv carried out between the years 2009–2016 was one of the three main sites and were located partly within the borders of the medieval city.

At Kongens Nytorv the archaeological results not only confirmed the knowledge from previous excavations, but also brought to light very significant new information. The most eye-catching features from the excavations were the discovery of the fortifications and the well preserved remains of the eastern gate to the city. The uncovering of boundary ditches, clay lined pits, workshops and domestic buildings dating from the Early medieval period revealed that the area was part of a settlement that was important enough to fortify, however, it was not until the Late medieval/Post medieval period that this area developed greatly. The finds material is unique and due to the anaerobic conditions found in the moats, the well-preserved organic artefactual reveal the more diverse side of the lives of the inhabitants of historical Copenhagen.

The results are presented in a technical report containing the most important discoveries and a comprehensive appendix with the descriptions of all archaeological features follows this report. In addition a cultural historical report based on the technical report has been produced with the focus on the results in a cultural historical perspective. The expectations are that the reports will be read both by professionals and the general public, but also used for research and comparable material for many years to come.

Lars Ewald Jensen, Archaeological Leader, Museum of Copenhagen

Contents

Cultural Historical Report

The purpose of this report is to place the results of the excavations at Kongens Nytorv in a broader cultural historical context – within the wider frame of the historical development of Copenhagen with focus on Kongens Nytorv, and to do so in a format accessible to the general public. In this report the main results will be presented and a cultural historical perspective will be added to the results.

During the medieval period Kongens Nytorv was situated on the eastern outskirts of the medieval city but after expansion of the city in the 17th century, the square came to play a central role in the city; a role it continues today. Archaeological observations have been undertaken at Kongens Nytorv over the last 100 years and after planning of the first metro station occurred a full excavation began in 1996/1997. The excavations revealed that whilst fortifications were the dominant feature, remains such as boundary ditches were uncovered providing settlement evidence of the area before the fortification. This led to high expectations for the 2009–2016 excavations for the discovery of both medieval and post medieval fortification as well as traces of earlier settlement prior to the fortification.

An area of nearly 7000 m^2 was excavated as part of the recent Metro Cityring Kongens Nytorv project and despite the previous knowledge of archaeological remains in the area, the recent excavations exceeded expectations. The most important new knowledge obtained from the excavation was the uncovering of the city's eastern gate building (Østerport), which was found to date from the early part of the 13th century. Important findings also include the discovery of boundary ditches from the early medieval period, which could help define the settlement and crafts in the area from the early medieval period until present day. Also, the uncovering of settlement evidence outside the moats from the early 16th century came as an unexpected revelation, portraying life outside the city boundaries.

This cultural historical report is based on the main excavation report that conforms to specific KUAS guidelines (Steineke and Jensen 2017). The main report complies with statements in Danish Museum law (Bekendtgørelse af museumsloven nr. 1505). The main author of the report is Field Leader Morten Steineke (all Chapters except Chapter 1, 2, 6, 7.10, 8, 9, 17, 19 and 22) which was written by Excavation Leader Jane Jark Jensen). The final editing and other report related work has been done by Morten Steineke. Responsible for figure production has been Karen Green Therkelsen.

The texts have been modified and shortened to a more readable form. This report contains many chapters split into various themes of the archaeological results both chronologically and thematically. Two of the main chapters focus on the Scanian Market (Morten Steineke) and the urbanization of the Kongens Nytorv area of Copenhagen (Jane Jark Jensen) and the other one on the medieval and Post medieval fortifications (Morten Steineke). Lastly it should be mentioned that a chapter on the first Metro excavation at Kongens Nytorv is applied to supplement the knowledge about the area.

Introduction to the excavation

The excavation at Kongens Nytorv took place in advance of the establishing of a new Metro station. This is a part of the new Metro Cityring system that will provide a new transportation system to the areas of the city surrounding the city core (Fig. 1). The Cityring is eventually going to be connected to the existing Metro system. Kongens Nytorv will be one of two already existing stations where the new metro line will meet the old one.

The establishing of an adjoining Metro station at Kongens Nytorv would affect high potential archaeological remains and rescue excavations were necessary in accordance with the Consolidated Act on Museums.

Fig. 1. Plan of the Metro Cityring in Copenhagen with location of Kongens Nytorv marked.

The excavation of the main area started in December 2009 and ended in September 2011. The main area of investigation was the location of the future access to the new metro station and in a high potential area of archaeological interest. In 2012, 2013 and 2014 the excavation of the Station Box was conducted under archaeological surveillance. In 2016 an access from the Royal Theatre was established and again this was conducted under archaeological surveillance. The Museum of Copenhagen is responsible for the archaeological work carried out in Copenhagen and Frederiksberg municipalities and therefore conducted the archaeological work on this site. The work was carried out under Part 8 of the Consolidated Act on Museums. This means that the contractor must finance the cost of the archaeological work (registration, observation and documentation) in connection with destruction of archaeological remains.

The location

Kongens Nytorv (translates into the King's New Square) is today a central square of the inner city, with Krinsen as the central area. This was not always the case; the eastern city gate of the medieval fortification was placed here on the

first brick built fortification surrounding Copenhagen, but neither written nor do archaeological sources so far seem to indicate that the area was used to its potential in terms of close settlement or activities. All knowledge up to the present day seems to indicate an area on the outskirts of medieval Copenhagen with limited activities.

The square of Kongens Nytorv was originally founded in 1688 and placed just east of the medieval city and just west to the New-Copenhagen which was laid out by King Christian the 4th when he expanded the city that outgrew its medieval boundaries in the beginning of the 17th century. The square was laid out as a baroque garden (named Krinsen) by King Christian the 5th with an equestrian statue of himself as a central figure and the square was lined with mansions. Two of these 17th century buildings still stand today and the square is also home of the Royal Theatre and the oldest existing pub in Denmark – Hviids Vinstue, founded in 1723.

For a period between 1749 and around a hundred years after the garden was closed down and the square functioned as a military drill ground.

Krinsen was reconstructed back to its original baroque style in 1908 after the original square. With the large mansions surrounding the square, today's Kongens Nytorv has preserved its original characteristics from the 17th century (Fig. 2).

Fig. 2. Krinsen and Kongens Nytorv before the excavations in October 2009. Photo: Morten Steineke.

The excavation

A prioritization of the large scale excavation area at Kongens Nytorv was necessary in order to keep the archaeological budget at a reasonable level, but also according to the different types of archaeological features, that were expected in the area, that would demand different kinds of excavation methods. On the basis of what was known about the area from both archaeological and written sources, a plan of prioritization was laid out (see below). Some knowledge

of Kongens Nytorv was gained from earlier archaeological excavations; in particular the excavation for the first Metro station at the square excavated in 1996–1998 (see Chapter below). From the results of this excavation the museum knew that there would be potentially quite significant remains of the fortification surrounding Copenhagen in the medieval and Renaissance period. At this excavation also remains from the 11th century were retrieved.

Excavation areas

In order to prioritize the archaeological work the investigations were separated in four different areas with different potential based on what was known about the area from historical and archaeological sources (Fig. 3). This resulted in the following prioritizing with type 1 and 2 as high potential areas and 3 and 4 as representing less potential.

Type 1 The high priority area with the highest expectations of complex archaeological findings. This was the area that was behind the medieval fortification and which was expected to contain remains from the early medieval period and maybe even Viking Age. This would include settlements, ditches, wells, etc. This area was fully excavated to the geological layers and mainly by hand.

Type 2 The medieval fortification and the area just outside. This would include walls, embankments, moats, etc. Less complicated archaeology was expected in this area due to larger and more recognizable archaeological remains. The archaeological fieldwork in this area was often assisted by machine power due to less complex layers.

Type 3 Mostly watching briefs including the Station Box. As well as in the type 2 area, larger archaeological findings were expected and also of primarily post medieval dating. In these areas the excavation was done by machine to the depth needed by the contractor and surveyed by archaeologists. When archaeological remains were detected the archaeologists registered the remains at a fairly high speed and in less detail.

Type 4 Watching brief areas where mostly less complex and larger features like levelling layers were expected. Most of the type 4 area was on the outskirts of the Kongens Nytorv area and expected to be of a relatively young age. When archaeological remains were detected the archaeologists registered the remains at a fairly high speed and in less detail.

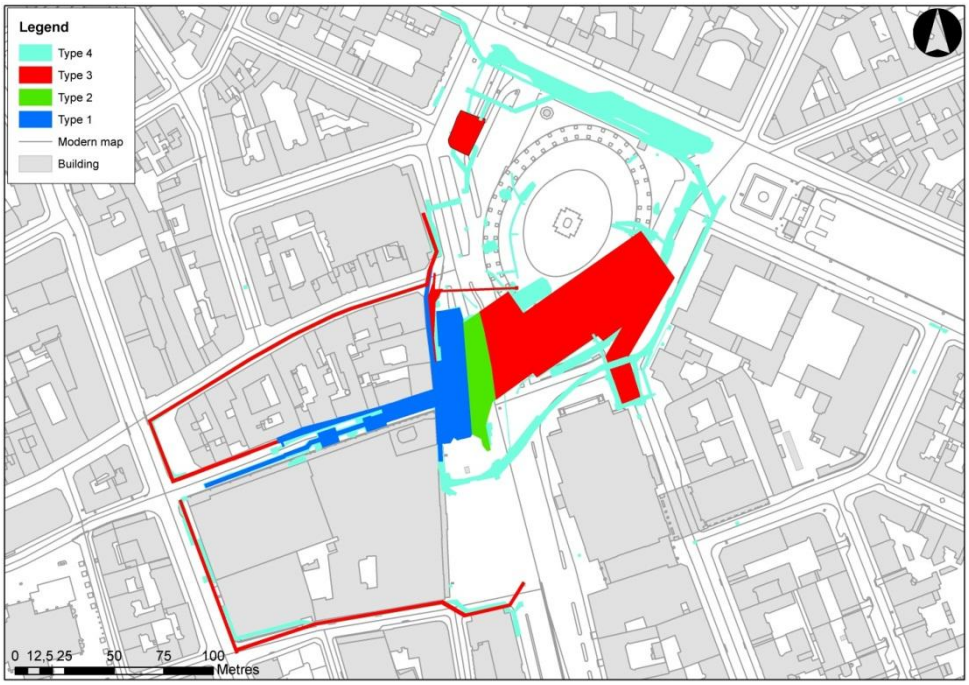

Fig. 3. Map of Kongens Nytorv with the type 1-4 areas.

Regional geology and topography

Copenhagen is situated on ground moraine gently undulating from 0 to 30 metres above sea-level. To the north the region is hilly and partially wooded with several large dead-ice lakes. Late-glacial gravel and sand outwash deposits cover the hilltops to the north. To the south the region is dominated by a low open clay-till plain called Heden. Here the region is generally flatter with fewer moraine ridges, Valby Bakke being a notable exception.

Geotechnical surveys around Kongens Nytorv have recorded the stratigraphy to a depth of 56 m. Danien chalk and bryozoan limestone form the base of the sequence up to a depth of about 13 m. This is overlain by about 10 m of alternating layers of clay till and well sorted coarse outwash sand. The post-glacial deposits are comprised of marine silt and/or sand overlain by detritus “gyttje” and/or humified peat. In some sequences it is unclear whether the silt and fine sand layers originated during the Littorina Transgressions or as Late-glacial Diluvium (Crone & Koch 1965:3; Bahnson 1973:2-3).

The landscape around Copenhagen has risen since the last Ice Age leaving the area as flat and low lying moraine with scattered hills. In the Middle Ages the area consisted of a natural coastal bay sheltered by the island of Amager and the islets of Slotsholmen and Bremerholm.

The Littorina Sea existed around 7500–4000 BP and included as many as four transgression and regression cycles producing four relative stationary shorelines during high-stands in the Late-Atlantic and Early-Sub-boreal periods. The determination of the shoreline displacement curve and the Littorina Transgressions are based on dated material from prehistoric settlements and graves, stray finds of flint tools together with pollen analysis, diatom analysis[1] and radiocarbon dating[2] of material within and beneath the Littorina deposits. However there is still some uncertainty about the isostatic uplift and the eustatic ocean fluctuations.[3] The maximum high-stand during the late-Atlantic Transgression at 4300 BC in the Copenhagen area has been estimated to lie between kote +3.2 and +4.1 m (Christensen 1995).

During this transgression maximum, Copenhagen was divided by a narrow strait from Øresund that extended through the "Lake Valley" formed in the present location of Sortedamssøen, Peblingesøen and Skt. Jørgens' defensive reservoirs. This strait connected to Kalvebod Strand near the preset location of Vesterbro Torv in the south and near the present position of Frihavnen to the north. The paleo shoreline lie approximately where Kronprinsessegade is today. Refshaleholmen, Plantholm (Mågeøen), Bremerholm, Strandholm (Slotsholmen), Skarnholmen and all other islets between Zealand and Amager were all covered by water (Christensen 1963:2-3).

After the Littorina period the sea retreated gradually to the coastline we know from historical times. According to estimations made by geologists, the shoreline around 1000 AD is believed to have been at kote +2.0 to +2.5 m with a course just east of the Royal Theatre, northeast of Charlottenborg and through the Amalienborg area (Fig. 4). It can not be excluded that the shoreline may have stretched to the north of Vingårdsstræde near Lille Kongensgade (Crone & Koch 1965:2; Fabricius 1999:Fig. 33b), though as seen on Fig. 4 this suggestion is uncertain. It must be pointed out that shallow marshy areas with low relief coast, such as Copenhagen, were frequently flooded. These floods produced a variable shoreline.

[1] Diatoms are a major group of algae and among the most common types of phytoplankton. Diatoms are good indicators of a range of water quality variables and indicators of water salinity.

[2] Radiocarbon dating (C-14 dating) is a method for determining the age of an object containing organic material by using the properties of radiocarbon (^{14}C), a radioactive isotope of carbon.

[3] Land and sea level changes.

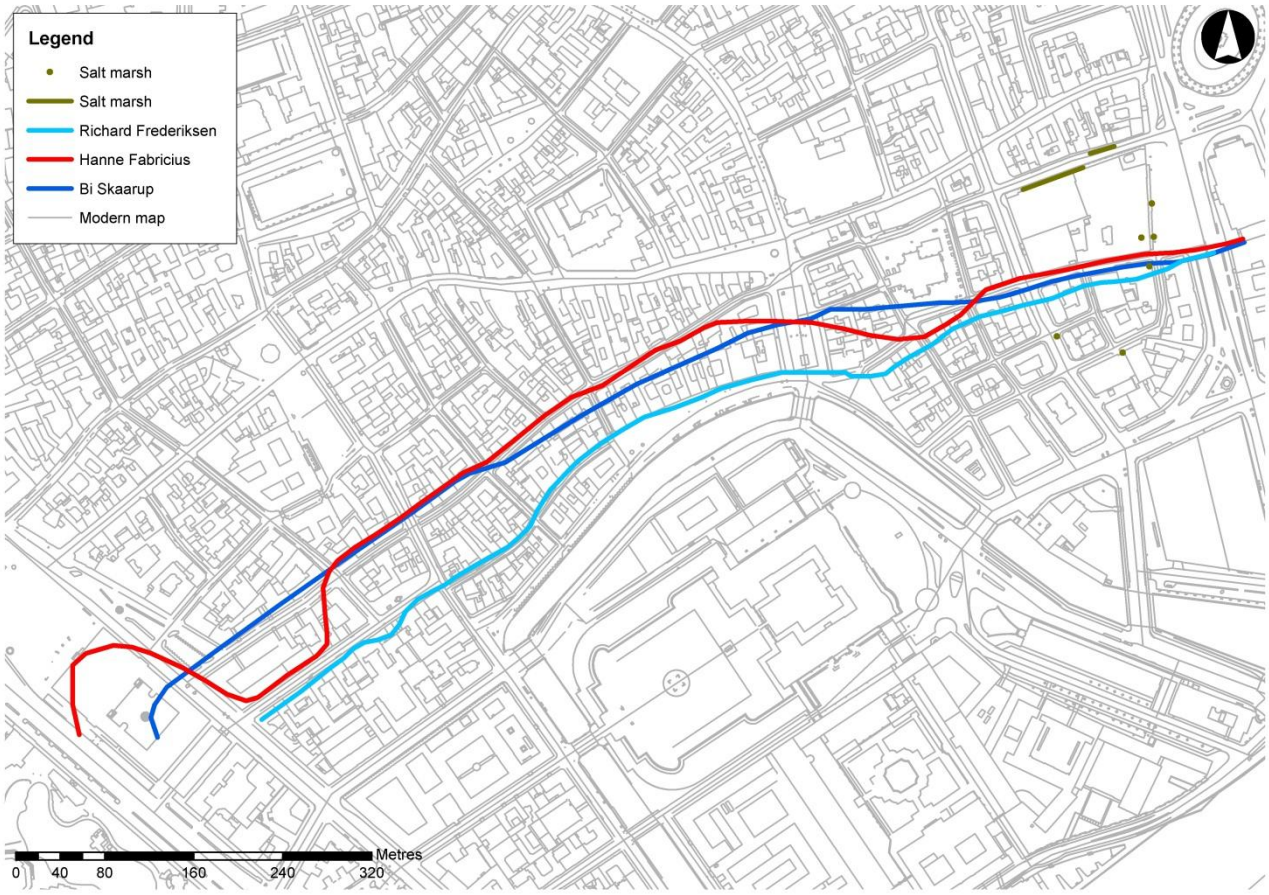

Fig. 4. Estimated shoreline around 1000 AD and previous geological and archaeological observations of peat layers (former salt marshes) around Kongens Nytorv before the excavations in 2010.

The shoreline of the Early Middle Ages has not been completely identified as hardly any excavations have revealed information on this matter. The early 13th century shoreline has been ascertained from Løngangsstræde in the west end to Højbro Plads in the east (Skaarup 1999:81). It is generally thought that marshy, shallow areas existed in many parts of Copenhagen in these centuries, and that these may have flooded frequently, resulting in a fluctuating shoreline.

Analyses of pollen and macrofossil samples[4] suggest that the Copenhagen area during the 11th century was dominated by meadows with reed swamps and wet meadows. This environment in the upper coastal intertidal zone between land and salt water or brackish water produced peat layers of varying thickness from 0.2 m to over 1.0 m, depending on local depressions, stream courses etc. (Christensen 1963:3 et seq.). Earlier Metro investigations proved traces of this wet meadow vegetation survived in the southern part of the excavation area, which indicated that the land had been flooded sometime during part of the 13th century (Kristiansen 1998:41).

Copenhagen's original topography has changed much during the last 1000 years. Refuse from households, livestock and industrial production has been dumped to fill and grade the coastal terrain. Debris from large fires in 1728, 1795 and 1807, produced when the remaining ruins were demolished to provide room for new buildings, has contributed to the construction of thick cultural layers. The city grew from a small medieval settlement on the Kalveboden strait,

[4] Preserved organic remains.

sheltered by the island of Amager and former Slotsholmen and Bremerholm islets. Also, islets and small bays have been capped and filled, and the town has broadened far beyond the original shoreline (Christophersen 1985:69).

The Metro excavation 1996-1998

During the first phase of the Metro development in 1996–1998 the parking east of Magasin towards Holmens Kanal (c. 1500 m^2) was excavated including large parts of the fortifications and early settlement (Kristiansen 1998; 1999a-c and Fig. 5). The dominant feature was the city's fortification, but it also uncovered a number of different features that can be linked to the settlement in the area before and after the fortification. It was possible to divide the constructions and structures into five main phases.

Fig. 5. Overview of Metro excavation in 1996–1998, facing west. Photo: Museum of Copenhagen.

Before the fortification 1020–1200 AD

Except for a C14-dating[5] from a natural deposit dated to the Stone Age, the earliest activities were represented by several north-south orientated boundary ditches in the northernmost and western parts of the excavation area and about 10 m east of Magasin's department store facade.

The ditches probably formed boundaries between a property and the adjacent salt marshes. Oldest were three ditches which replaced each other. After use the latest ditch was followed by an at least 11.5 m long and 0.4-0.5 m high wicker fence and a feature interpreted as some form of boundary bank to the west, at least 0.6 m high and maximum at 5.0 m wide. The stratigraphical relations between these two features were unclear. In the middle and southern parts of the excavation area only one single ditch was documented.

[5] Radiocarbon dating (C-14 dating) is a method for determining the age of an object containing organic material by using the properties of radiocarbon (^{14}C), a radioactive isotope of carbon.

The ditches were orientated as good as parallel with the current plot boundary at Magasin's eastern facade with a varied length between 6.2-29.5 m, width 0.8-5.4 m and a depth between 0.5-1.2 m, the latter based on the bottom measurements. The sequences of the ditches profiles changed, being slightly rounded to the north and wide to flat-bottomed with gently sloping sides to the south. South of the oldest ditch, and the extension of this, a series of elongated pits were documented without further determination.

The fence consisted of horizontal wicker. Some of the vertical poles were still in place, but the majority had been drawn up and the fence tipped over to the east (Fig. 6).

Fig. 6. Excavating north-south running wicker fence. Photo: Museum of Copenhagen.

A total of nine radiocarbon datings were completed in connection with the boundary ditches. Seed from fill in the oldest ditch was C14-dated to 1029–1158 AD[6]. Seed from one of the elongated pits was C14-dated to 1045–1217 AD and "gyttje" from the bottom of a ditch was C14-dated to 620–776 AD. Twigs and a wood artifact was C14-dated to 1046–1270 AD, but the date is highly likely to be second half of the 12th century/early 13th century, partly due to CBM (Ceramic Building Material) in a structure stratigrapically older than the ditch and the reservoir effect on the "gyttje" sample.

Traces of flax retting and animal bone in a ditch could be dated to late 12th century/early 13th century. A bundle of flax from the same ditch was C14-dated to 1024–1215 AD and animal bones to 989–1155 AD. Collected ceramics were

[6] The following calibrated radiocarbon dates are presented using the 2-sigma values which account for 95.4% of the probability of the date falling within that particular range. All dating from previous excavations has been calibrated using OxCal version 4.2.

dated to 1100–1500 AD, 1225–1350 AD, 1315–1350 AD and as late as 1300–1700 AD and 1350–1800 AD. A later contamination could be the case since several of the ditch fills consisted of red bricks, but without further description or information. A branch and wood from the wicker fence were C14-dated to 694–971 AD and 1185–1288 AD, where the latter dating is most likely. Twigs and wood chips in a layer of seaweed were C14-dated to 1021–1212 AD.

The boundary ditches and the wicker fence were disused in the last decades of the 13th century, and then covered by salt marshes and a faeces layer from humans and animals, where wood and twigs were C14-dated to 1308–1436 AD, 1256–1398 AD, 1173–1295 AD and 1160–1265 AD. A handle made of deer antler with animal ornamentation recovered from this rubbish layer could be dated to the 11th century (Fig. 7). After this the area was covered by the facilities of the city's fortification.

Fig. 7. Handle of deer antler found at the first Metro excavation at Kongens Nytorv (KBM 1410) and dated to the 11th century. Photo: Museum of Copenhagen.

Due to the excavation's orientation, the supposed settlement in the west was affected only to a lesser degree by the survey. Some layers and observations in the NW part could be interpreted as remains of buildings consisting of floor layers and imprints of a north-south orientated foundation belonging to a building dated to the 1200–1300s, a north-south orientated base plate, a fireplace, pits and trenches. Three of these pits were interpreted either as postholes, board- or erosion holes (?). Activity layers registered against Magasin's facade in the same way as the levelling and rubbish layers over the boundary ditches indicated different types of activities from the 11th century, perhaps as early as the first half of the century, though this suggestion is based on only one C14-dating and the Viking Age handle.

Medieval fortification 1200-1550 AD

The medieval rampart's oldest range was documented in the western part of the excavation area approximately 10.5-11.0 m east of the current facade of Magasin. Due to the orientation of the excavation area, the rampart and city wall were predominantly documented using profiles where different and interpreted phases and construction details were compared. Only smaller areas were excavated contextually.

The High medieval rampart was divided into 14 more or less identical and chronologically contemporary sequences and could be followed for at least 75 metres with a minimum height of 1.7 m, where the top had been dug away by modern truncations. The foot of the structure was recorded from 4.5 to 6.0 m west of the foundation of the city wall, to the east the distance was 2.6 to 3.6 m to the edge of the moat, which made the width between 7.1-9.6 m.

No reliable growth horizons were recorded either archaeologically or through macrofossil analysis and the building material consisted of sub-surface material (moraine) mixed with organic material (peat and topsoil), with the exception of one deposit that to a greater extent consisted of brick rubble. Only a few finds were collected consisting of ceramics dated to late 13th century, 13th–15th century and 14th (15th)–17th century.

The city wall was interpreted to be contemporary with the oldest rampart, and not a later addition. The courses and the rampart layers had been built "step by step", where the purpose of the rampart had been to stabilize the boulders. No part of the brick wall was preserved. The foundation of this medieval structure could in a more or less fragmented extent be recorded in a large part of the excavation area.

The city wall was preserved as three foundation courses and boulders consisting of two rows of stones with a width between 1.1-1.7 m and a height of at least 1.4 m. The top of the foundation was not preserved and no mortar was recorded on the stones.

Part of the city wall, consisting of a continuous remnant of a brick wall at least 1.8 x 1.2 m with medieval course was documented in the moat together with bricks and limestone ashlars. The remnant was interpreted as part of the parapet. The wall had been 0.42 m thick with unfilled joints. No reused bricks were identified in this part of the brick wall. Three thermoluminescence dates[7] from mortar connected to the remnant were dated to 1227±60 AD, 1255±60 AD and 1230±60 AD.

Inclusions of smaller 16th century bricks together with medieval bricks ("munkesten") in the decomposition layers in the Late medieval moat and within the new rampart in the southern part of the excavation area, were an indication of repairs and extensions of the wall. The interpretation was also that the city wall mainly had been demolished in connection with Valkendorf's work on the fortification in the late 1500s.

The High and Late medieval moat could be followed the entire length of the excavation immediately east of the city wall foundation (Fig. 8). This could, however only with certainty be separated from a later post medieval moat phase in the moat's westerly part located under the rampart (see above). The moat had been cleaned up through the Middle Ages and estimated to have been at least 1.4 m deep.

[7] Thermoluminescence (TL) dating is the determination, by means of measuring the accumulated radiation dose, of the time elapsed since material containing crystalline minerals was either heated (lava, ceramics) or exposed to sunlight (sediments).

Fig. 8. Profile through Late medieval moat, facing SW. Photo: Museum of Copenhagen.

Archaeobotanical analysis[8] showed that the environment had consisted of brackish, stagnant water. A weak salt effect showed that the mud had been formed before the filling up of Dybet between the coast and Bremerholm in the 1530–1540s.

At the excavation a north-south orientated palisade used as alternative rampart reinforcement at the edge of the moat was documented. This consisted of several pits and postholes in a row at an estimated length of either 42.0 or 64.5 m.

A bigger structure was recorded orientated across the rampart and consisting of two to three courses of foundation stones and a 6.7 m long, 1.0 m wide and 1.7 m high double faced wall of edge set courses, coated with lime mortar and with intermediate fill of mortar. Mortar from the northern side was C14-dated to 1276–1396 AD, bricks from the lower course thermoluminescence dated to 1140±70 AD and animal bones from the same context C14-dated to 1028–1213 AD. The construction could not be statigraphically related to the rampart and it is unknown if this was contemporary with the medieval fortification or a later structure. The feature was, however interpreted as part of the medieval tower Smørhætten, described in written sources in 1496 and 1523.

Other post-rampart activities in the area consisted of a brick kiln built in several phases (kiln, brick floor, two brick benches, six heating channels and brickwork of so-called “munkesten” preserved in six courses. The sides were remarkably built with lime mortar. The heating room was 6.0 m wide and 3.2 m deep (inside dimensions). In front of

[8] Archaeobotanical analysis is the study of remains of plants cultivated or used by man in ancient times, which have survived in archaeological contexts.

the kiln, to the south, a fire pit with charcoal was recorded. The suggestion was that the brick kiln had been used for brick production connected to the construction of the city wall and covered by a later phase of the rampart. TL-dates of bricks in the kiln were dated to 1210±60 AD and 1310±60 AD. Charcoal from the fire pit was C14-dated to 1161–1297 AD.

The rampart street covered the foot of interpreted rampart phase and consisted of a regular and compact layer of pebbles with inclusions of animal bones. Several wheel ruts were recorded. The street had been covered by a later rampart sequence of unknown date. Animal bones collected were C14-dated to 1047–1275 AD.

Two structures consisted of a north-south orientated flat based wood reinforced ditch cut into a rampart layer and under another rampart layer. The ditch had a length of 10.5 m, but could also have been as long as 60.0 m. The total width was 5.8 m. The fill consisted of kitchen and stable waste: bones of cattle, domestic pig, sheep/goat and fish together with plant remains such as bog myrtle, hops and figs. Dendrochronological analysis[9] dated the wood to winter 1298/1299 AD and a repair to c. 1303 AD.

Post medieval fortification 1550–1608 AD

Under the rule of Frederik the 2nd, the fortification underwent a major modernization along its length headed by Christoffer Valkendorf in 1581. The rebuilding of the fortification could be seen as a substantial stone structure consisting of two to three courses immediately east of the foundation of the city wall, although the relationship between this development phase and older features was unclear at several places within the excavation area (Fig. 9).

Fig. 9. Interpreted addition to the fortification in the 1580s conducted under Valkendorf's management consisting of a large foundation of boulders, facing north. Photo: Museum of Copenhagen.

[9] Dendrochronology is the scientific method of dating tree rings to the exact year they were formed in order to analyze atmospheric conditions during different periods in history.

The suggestion of a new city wall was based on the orientation and traces of mortar fringe after a masonry with 0.42 m thickness on the foundation stones, demolition material and looting ditches, but it is worth mentioning that this interpretation is rather uncertain.

The oldest sequence of the "new" city wall was recorded as courses of foundation stones together with demolition material from the original brick wall. Since there were no traces of the brick wall itself, this was explained by the fact that this could have been standing on higher placed sill courses. Suggestions that the city wall was restored at some time could also be explained by functional differences within the new structure.

The medieval city wall had probably been torn down, whereupon the demolition material of limestone ashlars, rubble (both medieval bricks and smaller 16th century bricks), larger pieces of the city wall combined with other materials had been re-used in a new foundation front. The rampart had partially been made of peat and made taller and wider, covering at least 1.4 m of the wall base. Over the rampart a straw layer was documented, interpreted as remains of a growth horizon on the rampart's surface.

In the new phase the embankment was pushed approximate 4.0 m to 5.5 m beyond the medieval moat. The post medieval moat could not be separated from the earlier moat, but had been approximately 10.0 m wide, where the bottom kote lay between -1,0 to -0,5 m. The depth had not been more than 1.0 m. The sedimentation in the moat consisted of natural "gyttje" deposited in freshwater and swamp peat with vegetation that thrived in low water, the latter at kote +0,4 to +0,6, which proves that the connection to the sea at this moment was interrupted. Some of the layers recorded were interpreted as cleanup layers from the moat when still in use.

Ditches connected to the foundations suggested a looting of the wall in the early 17th century, but the traces were not clear.

Christian the 4th's fortification c. 1608–1647 AD

The excavation also came to affect the city fortification from the years 1608–1647 AD. A new fortification was constructed around the city, consisting of small bastions and the long intervening stretches of ramparts (curtains). The excavation area included the rampart between the new Østerport and its bastion and the so-called Bastionen ved Iskulen.

The medieval moat was filled up, while the rest of the medieval fortifications were incorporated in the new defences. All of the work on this part of Copenhagen's fortifications was completed around 1617 AD.

Only a few layers could be interpreted as remains of the curtain. A row of stone imprints were suggested as the western part of the curtain foundation. At the excavation a 40 metre long bulwark of boulders of at least three courses, orientated in a north-south direction was recorded, possibly a western reinforcement or bulwark of the new harbor. Through the curtain there was a gate, the so-called Vandporten, which served as a transportation route into the city for the goods that were unloaded from the ships in Holmens Kanal (Fig. 10).

Fig. 10. Vandporten and later sewer pipe, facing east. Photo: Museum of Copenhagen.

The gate had been 11.6 m long with a west facade 0.8 m thick. The gate room was 5.8 m wide, the sidewalls 1.9 m wide with the foundations slightly wider. The preserved height varied from 1.78 m to 2.75 m of an estimated total height of 6.0 m. The foundation of the facade was 13.0 m long and stretched respectively 1.8 m and 1.5 m outside the rest of the structure's dimensions. In relation to the gate room's width the facade was twice as wide based on the total length of the structure. The foundation was partially made of reused medieval bricks and this had survived up to street level. TL-dating of reused bricks from the gate's facade gave the dates 1200±60 AD, 1170±60 AD and 1270±60 AD. Placed between the sidewalls there was a 14.8 m long brick sewer with walled barrel vault built with small yellow bricks and an associated wooden water pipe. This sewer was somewhat misleading, TL-dated to 1400±60 AD. In the gate room's north-eastern part traces of the paving was recorded placed c. 0.70 m under the current street level.

Other activities and buildings behind the fortification line

Building remains that may be identified in the written records mentioning buildings behind Christian the 4th's rampart were also identified. One feature consisted of the remains of a brick chimney C14-dated to 1163–1278 AD. Beside this, a foundation of boulders, looting ditches connected to the former city wall, ditches and pits with unknown function, rows of sill stones and floor layers and wooden water pipes were recorded.

Remnants of the demolition of the fortification consisted of looting ditches, 20 wooden water pipes and one pipeline trench mainly orientated in a north-south direction and where two of the pipes were dendrochronologically dated to 1618–1619 AD and 1749–1750 AD. The existing moat had gradually been filled up with different material.

Time Phases at Kongens Nytorv

The following chapters are a description of all time phases and an introduction to the finds excavated at Kongens Nytorv from 2009–2016 (Fig. 11). The chapters will describe the most distinct archaeological features of every time phase and discuss and interpret the results in a cultural historical setting. In some of the time phases there will also be paragraphs on features – historical or archaeological – that characterize or describe the time period in question. A full listing of all archaeological features/groups in each time phase is presented in the excavation report and the appendices (Steineke and Jark Jensen 2017).

Fig. 11. An overview of all archaeological features (marked in black) measured with total station or GPS and registrered.

Phases

The archaeological results are presented chronologically, but in order to provide an adaptable overview, the time phases have been sorted in areas that make sense in both time and an archaeological frame.

The main excavation areas were split into subareas (Fig. 12) and these subarea namings will be used when relevant to locate the archaeological findings.

The presentation of the time phases has been split up into three main areas; behind the fortification, the fortification and outside the fortification as follows:

- Moraine, salt marshes and other Quarternary observations

- Prehistoric finds and features
- Early medieval activities 1050–1200 AD
- High medieval fortification 1200–1350 AD
- Late medieval city wall 1350–1550 AD
- Eastern gate building 1200–1600 AD
- Late medieval and Renaissance fortification 1300–1600 AD
- High and Late medieval settlement and activities 1200–1550 AD
- Eastern gate building and Post medieval fortification 1600–1650 AD
- Settlement and activities behind the rampart 1550–1650 AD
- Outside the moat. Settlement and activities 1550–1650 AD
- Kongens Nytorv 1650–1950 AD

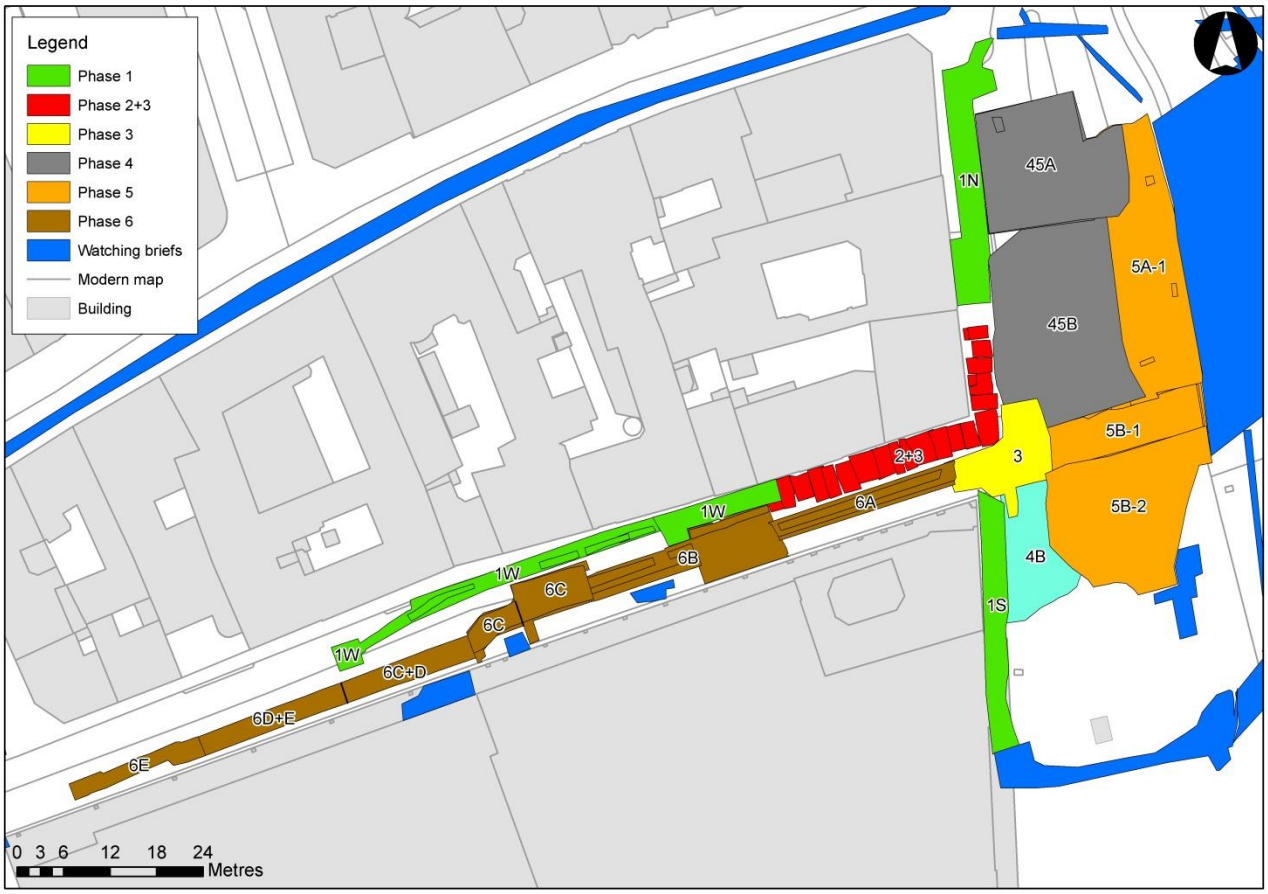

Fig. 12. Excavation at Kongens Nytorv with type 1 and type 2 areas with subareas – named phases during excavation.

Chronological development

As an introduction to the next chapters a brief review of the site of Kongens Nytorv is presented here in chronological order.

Before Kongens Nytorv was inhabited by people, the area was dominated by salt marshes with the original coastal meadows that were documented archaeologically as a dark layer on top of the natural sand and clay/natural ground. There are only a few traces of cultural influence and the area had probably been used for grazing of livestock. The prehistoric period is represented by finds of worked flint and even though most flints occurred in secondary contexts,

it points to the presence of a fragmented near-shore settlement at Kongens Nytorv. The dating of the collected finds points to the Late Mesolithic and Neolithic periods (5400–1800 BC).

The first clear human presence documented at Kongens Nytorv is from the early medieval periods before 1200 AD. Ditches parallel with the present north-south line interpreted as plot markers and pits that might have been used for storage were excavated. The most interesting features in this period are the clay lined pits and they are placed in the mid 12th and early 13th century based on AMS-dating[10]. Their function is not clear, but similar pits documented on the coastline in Scania indicate that they have been used for storage or preparation of herrings in connection with fishing in Øresund.

The first phase of the city fortification can be dated to the early 13th century. This consisted of a rampart built using material dug up in connection with establishing the moat. Traces of a probable stockade "*Byens Planker*" were registered in one of the two earliest phases of the rampart as well as 17 meters of bulwark (dated dendrochronologically to the early 13th century) to support the rampart on the edge of the moat.

The key feature in the fortification was the eastern gate (Østerport), of which original parts date to the time of the first phase of the fortification in the early 13th century. The building was maintained and remodeled several times until it was demolished in 1608. Through the gateway several road layers with wheel ruts were preserved. Road layers were also documented in connection with the inner gate building – both in connection with the rampart street and outside the late medieval moat.

Just south and in connection with the eastern gate the foundations of a customs- or guard building was excavated and the dating of this falls in the 14th century.

Following the interpreted outline of the *"Byens Planker"* a brick built city wall was erected which is difficult to date but is likely to originate around 1350 AD. The city wall could be traced for a length of 19 metres. Remnants of the wall found in other parts of the excavation area suggest that the city wall had merlons.

In the early 17th century the eastern gate and the guard building are renewed and expanded in the exact same spot as the medieval gate. The entire medieval fortification is replaced with a new and larger fortification and part of the bastion, the curtain running along the new 17th century moat and five of the bridge pillars across the moat were excavated. This fortification does not last long, and by the middle of the 17th century it is abandoned.

Behind the medieval fortification settlement and boundary ditches can be followed continuously from the 13th century onwards till the present day. There is evidence of permanent housing, streets, wells, pits and other traces of urban environment. Also the remains of a forge were excavated. The findings indicate that the area was relatively modestly used, when compared with other findings in urban Copenhagen. This can also be a result of modern disturbances.

By the middle of the 16th century and until the final destruction of the Post medieval fortification, a settlement existed outside of the moat. At least two buildings were excavated and also traces of possible gardens, alleys, boundary fences and roads with wheel ruts were documented.

From the middle of the 17th century and to the present day observations of predecessors to standing buildings around Kongens Nytorv were observed. Also building remains from the Lille Gjethus (the cannon foundry) from 1698 were excavated.

[10] AMS (Accelerator Mass Spectrometry) radiocarbon dating is a way to obtain radiocarbon dates from samples that are far tinier than that needed for standard radiocarbon dating.

Finds

Finds in an archaeological excavation are of great importance – for dating layers and they can also tell something about the different kinds of activities in different areas or constructions. It is of vital importance to note that almost all finds from an archaeological excavation come from secondary deposited layers. This means layers that have been moved to their location from somewhere else. Only a very small percentage of the finds come from primary layers like for instance floor layers or road layers – layers that are created on the spot. This is also the case with the finds from Kongens Nytorv, where a lot of layers are secondary deposits on site. These being dump layers, levelling layers, fills and garbage layers in pits or deconstructed postholes. In some cases it is more likely that the secondary layers come from the nearest surroundings. These being fill in pits, postholes and maybe also the moats. Larger levelling layers and fills in boundary ditches can be moved from places further away since this kind of work would demand a larger volume of soil or dump material. This means that using the finds for dating layers or identifying activity has to be carefully approached.

The moats generated the greatest amount of finds. Due to gradually filling up, the moats have been cleaned at several times while in function, and this means that the finds to some degree have been moved around in the moats. The finds have most likely been dumped in the moats – some of them one at a time – for instance a broken toy or a drinking vessel. But it is also most likely that citizens of the city would dump larger amounts of garbage in the moats even though this was probably forbidden by law.

In general the finds at Kongens Nytorv were in excellent condition when excavated. The moist layers in the area caused by the nearness to the former coast line and present water canals/moats made the circumstances excellent for finds to be preserved in the layers. Of course finds – and primarily the organic finds – were in fantastic condition from the moats.

The finds were prioritized for conservation, but since organic finds of bone, wood, textile and leather in such a good state of preservation are rare and the fact that they represent unique findings (one of a kind), many of these were prioritized for conservation. Also metal finds were fairly well preserved and therefore prioritized for conservation, but many of these were nails or unidentifiable artifacts. Quite a lot of these were still unidentifiable after X-raying, but some of these have been kept for research or future identification.

Type of finds

The finds have been sorted into subclasses and classified by function using function types. The table below shows the different kinds of categories of finds and the percentage distribution (Tab. 1).

Finds Subclass	Examples of types of finds	Percentage of total
Medieval pottery (1060–1535 AD)	Pottery dating from medieval periods from c. 1050–1535 AD	4%
Post medieval pottery (1536–1800 AD)	Pottery dating from the Renaissance period (1536–1660 AD) and later Post medieval period (1661–1800 AD)	54%
Stove tiles	Decorated and undecorated tiles from stoves	5%
Leather	Various types of clothes (non military), shoes, slippers	5%
Textile	From clothing to household furnishings, i.e. covers, curtains, etc.	1%
Glass	All types of glass vessel and window glass	5%
Slag and other metallurgical waste	All by-products of metalworking	1%
Wall tiles	Decorated and undecorated tiles from structure	Under 1%
Household equipment	A selection containing wooden house furnishings to metal storage items, barrels, buckets and cooking and non ceramic storage	2%

	objects	
Arms and armour	Military weapons, projectiles and armour	Under 1%
Coins and tokens	Coins and various trading tokens	Under 1%
Personal items	A broad category representing finds linked to the individual, i.e. jewelry, badges, brooches, religious, buttons, etc.	Under 1%
Combs and comb cases	Combs and comb cases from all periods from all different materials	Under 1%
Toys and games	An assemblage of all types of toys, games, gaming boards and gaming piece fragments	Under 1%
Horse equipment	All types of equipment for the horse, i.e. horseshoes, nails	Under 1%
Tools	All various craft tools and equipment linked to industry	1%
Ships and fishing equipment	Finds covering the broad spectrum of maritime archaeology and fishing equipment	Under 1%
Security equipment	Archaeological equipment comprising various types of keys, locks and draw bars	Under 1%
Textile production tools	Crafts persons equipment linked to textile production and repair, i.e. pins, needles, thimbles, needle cases, etc.	Under 1%
Trading equipment and cloth seals and other seals	Cloth seals, trading stamps, various trading objects outside of glass and ceramic finds objects	Under 1%
Writing equipment	Slates, pens, stylus, stylus cases, wax slates	Under 1%
Knives and cutlery	Domestic knives and knife and handle fragments, table knives, spoons and forks	Under 1%
Flint	Flint tools, gun flint and percussion flint	1%
Clay pipe	Clay pipe fragments, pipe production equipment and figurines	5%
Rope	Rope fragments	Under 1%
Building materials	Roof-, floor-, ridge tiles, bricks and other building related materials. Decorated and undecorated. Statues and figurines	6%
Unidentifiable objects	Various finds, either unidentifiable or corroded through soil conditions and not subclasssed	4%
Other	Off-cuts, nails, other organic, skeleton	2%

Tab. 1. Kongens Nytorv. Finds subclasses, types of finds and approx. percentage of total.

The finds

By far the largest finds category is ceramics (and at most archaeological sites in general), and in order to say something general about the finds at Kongens Nytorv and socioeconomic status of the area it is an obvious first place to start. The medieval ceramics date from around 1100 AD and up until the start of the 14th century there is an absence of imported pottery that is very common in this period in other urban societies in Denmark and southern Scandinavia. Imported ceramics is a sign of status and foreign connections like trade.

The largest amount of medieval ceramic (1050–1550 AD) dates to 1200–1450 AD which might indicate a higher level of activity in the area, since ceramics dating before 1200 are very few (Fig. 13). From 1350 there seems to be an increase in imported ceramics that indicate a rise in status of the area suggested by the increasing more mercantile influence on the material.

Fig. 13. Baltic ware with a date frame c. 950–1250 AD (FO203807). Photo: Museum of Copenhagen.

45% of the total amount of the ceramics found on the site dates to 1550–1650 AD and there is evidence of local production from 1500 onwards, but also a larger amount of imports from the Netherlands, Germany, France and Italy (Fig. 14-16). The area seems at this point to be on a higher socioeconomic level with a larger diversity in the ceramic material. Even Chinese porcelain is registered in the material before the official trade with China in 1730. That said the ceramic material was still dominated by kitchen vessels and also trays and jugs. Things that are attached to everyday life in all social groups.

Fig. 14. Stoneware sherd from Cologne dated to 1566 AD (FO206929). Photo: Museum of Copenhagen.

Fig. 15. A so-called Stjert-pot that was a very popular cooking wessel in the Late medieval and Post medieval period. It had three legs, a handle (a stjert) and glazed on the inside (FO213022). Dating frame 1540–1570 AD. Photo: Museum of Copenhagen.

Fig. 16. Dutch faience with the year 1648 written on it (FO202729). Photo: Museum of Copenhagen.

The mercantile influence traced in the later medieval ceramic material can only be found in a more modest degree in other material like glass, coins and cloth seals (Fig. 17).

Fig. 17. 17th century Italian glass. This is the winged goblet or Flügelglas. A wineglass with a twisted stem on which blue wings have been applied (FO227015). Photo: Museum of Copenhagen.

Trade objects like seals, scales and other related objects are all of a post medieval date (Fig. 18). This does not mean that trade was none existent in the medieval period, but it is not to be proven by findings of directly related objects.

Fig. 18. An Early post medieval cloth seal made of lead. The A is the initial for the German town of Augsburg. The damage reverse of the seal has probably shown a pine-cone, the heraldic badge of the town. Augsburg was well known for its cloths, which were mixed linen-warp and cotton weft fabrics used as a substitute for velvet. Photo: Museum of Copenhagen.

Everyday life around the area of Kongens Nytorv is obvious in the finds material. As mentioned above pottery is the number 1 finds category and also a great representative of daily life. Also personal items as part of daily life were found; like buckles, combs, shoes, buttons, pins, bags, etc. (Fig. 19-21).

Fig. 19. Late medieval spring catch purse (FO503885) from 1550–1600 AD. The leather purse (200 x 140 mm) had traces of textile decoration and traces of wood as stabilizer for the bottom. The frame still appears to be in situ around the edges and there are metal fittings along the top edge. Photo: Museum of Copenhagen.

Fig. 20. Iron key dating from the Late post medieval period (FO501843). The shape and size indicates it has been used for a furniture or casket. Photo: Museum of Copenhagen.

Fig. 21. X-ray photo of the same key. Some details are more obvious using this method. Photo: National Museum of Denmark. Bevaring og naturvidenskab, Brede.

A collection of children's toys were also excavated from the moat, such as the little toy boat seen in figure 22 below, indicating that everyday life also played a major role around the fortification. The figure below shows a boat that would have been the obvious toy for children playing by the moat.

Fig. 22. Wooden toy boat (FO200948). Photo: Museum of Copenhagen.

The ever-present fortification does leave some traces in the finds material (cf. Fig. 23). Traces of musket balls and iron cannonballs were found, some of them had actually been used and hit a target. The conclusion is that despite these finds, the amount of similar finds would be expected to have been larger but this might be due to cleaning of the moat in several stages.

Fig. 23. Early post medieval, possibly German rapier. Quillon (FO501816). Photo: Museum of Copenhagen.

Fig. 24. Early post medieval decorated bone plaque (FO207364). Probably from a weapon's handle. Photo: Museum of Copenhagen.

General reflections on the finds material

In general the finds from Kongens Nytorv are what to be expected from most (larger) medieval and Post medieval urban contexts. There are signs of imported goods and artifacts, but considering the fact that Copenhagen in the Post medieval/Renaissance period was a fortified trade town, the amount of finds in general from a city of this status, as mentioned above, is rather few.

There is also a limited amount of prestige finds which would have been owned by the more prominent citizens like the bourgeoisie and courtiers that are present in the city from the Late medieval period. Instead there are traces of craft work like the finding of a medieval forge building, finds of slags and a great amount of household equipment. This points in the direction of a more modest part of Copenhagen with workshops and general everyday life of differing social status mostly reflected through the ceramic material.

This might also be confirmed by the finds of military objects like gambling pieces and plates with soldiers on (see Fig. 24 above). This could indicate an area with a more concentrated presence of soldiers, which would be obvious in connection with the fortification being in the area, but soldiers were often quite poorly paid and would be in need of a inexpensive place to live. The finds of used musket balls and cannonballs in the Post medieval moat could indicate a somewhat unsteady area to live in at times.

Moraine, salt marshes and other Quaternary observations

Results

The Ice Age deposits in the Copenhagen area consist of two layers of moraine separated by transgression layers (Bahnson 1973). The excavation area at Kongens Nytorv is placed on the transition between areas with respectively moraine and sand at the top of the sequence. Most of the excavation area consisted of subsoil of uniform transgression layers in places with a regular layering of thin layers of slightly coarser sand and in some places more compact layers of gravel and flint of different size. In the transition zone between the moraine and the transgression layers there were locally very irregular stratifications in the moraine that do not represent truncations, but may be due to processes associated with moving material or so-called cryoturbations.

As shown in the figure below the transgression layers and salt marshes are mainly registered in Lille Kongensgade, in connection with the fortification, where these layers have been protected by the medieval rampart, as well as in a wider area to the east outside the 17th century moat (Fig. 25).

Fig. 25. Overview showing traces of transgression layers and salt marshes at Kongens Nytorv.

The concentration of salt marshes in the western part is directly connected to the overlying and protecting rampart. The rest of the excavation area has been truncated by later activities, both historical and modern. In the watching brief trenches these natural layers were not measured due to limited depth and difficult survey conditions.

A salt marsh is an area of marshy ground that is intermittently inundated with salt water or that retains pools or rivulets of salt or brackish water, together with its characteristic halophytic vegetation. The salt marshes consisted of

water deposited sand with very decomposed organic material with varying contents of plant parts, leaves, stems, roots and rhizomes, branches, buds, etc. where this represents a growth horizon formed in a moist, brackish or fresh environment occasionally flooded by the sea (Steen Henriksen 1998:7-8). Limited cultural influences can be seen within these layers and no indications of human activity could be seen among the archaeobotanical material – but this is connected with the sampling and lack of further analysis. The original coastal meadows were documented as a 0.2 m thick, dark layer on top of the natural sand and clay.

According to estimations made by geologists and recent archaeological investigations the shoreline around 1000 AD is believed to have been going straight beside the contemporary Royal Theatre, northeast of Charlottenborg and then through the later Amalienborg area. It could not be excluded that the shoreline may have stretched to the north of Vingårdsstræde near Lille Kongensgade, but nothing in the main excavation area or nearby trenches supported such a suggestion. Test drilling in Østergade has also determined that the area was within the medieval coastline, but influenced by the previous Littorina Sea Transgression (Sørensen 2002).

It must be pointed out that the marshy area in the low-lying landscape of Copenhagen would have been frequently flooded at high tide and during storm situations, which must have resulted in a varying shoreline.

Analyses of pollen and macrofossil samples suggest that the Copenhagen area during the 11th century was dominated by meadows with reed swamps. The coast, where Copenhagen was founded, was characterized by wet meadows. This environment in the upper coastal intertidal zone between land and salt or brackish water produced peat layers of varying thickness, depending on local depressions, stream courses, etc.

At the Metro investigations during 1996–1998 there were traces of this meadow vegetation in the southern part of the excavation area, which indicates that the area during part of the 13th century had been washed over by the sea. The boundary ditches and a wicker fence had been abandoned in the last decades of the 13th century, and then covered by the salt marshes. Pollen and macrofossil analysis has shown that this natural, dense reed swamp was with time changed to pasture land (Kristiansen 1998).

No further pollen analysis was conducted on the salt marsh layers, but the area has probably been used for grazing, where the most extensive settlements from the Iron Age, with some exceptions, mainly existed in the interior. This type of settlement localisation is also familiar from the other side of Øresund (Björhem & Magnusson Staaf 2006:195 et seq.). However, C14-dates from the Viking Age could represent fishing activities on a more seasonal basis.

Prehistoric finds and features

Results

Despite the occurrence of most flints in secondary contexts, the evidence points to the presence at Kongens Nytorv of a fragmented, near-shore settlement or "activity spot" dating to the Late Mesolithic and to the Neolithic (5400–1800 BC).

Most of the material consists of non-diagnostic debitage. Notwithstanding these limitations, the assemblage affords important evidence of prehistoric settlement activity within the limits of Copenhagen. Also, patterns can be teased out of this material, which have chronological import and consequently corroborates inferences drawn on the basis of the formal tool types. The assemblage suggests that the majority of the finds derive from the later part of the Mesolithic (Ertebølle period), but Middle and Late Neolithic material is also present.

The assemblage consists of 113 flaked lithics from a variety of stratigraphic contexts and areas across the excavation. The principal findings of this study on the lithic material can be summarised in the following statements:

- A small amount of primary debitage.
- Few formal tool types.
- The presence of indirect percussion technique for blade production.
- A distinct lack of diagnostic Early Mesolithic components.
- It is possible to identify some of the flints as likely deriving from the coast by the presence of a marine affected cortex (white patinated) and indications of rolling.

There are 48 blades in the assemblage, of which 31 can be categorized as irregular blades. The remaining 17 regular blades are mostly plein débitage (i.e. prismatic blades with no cortex and transversal scars) struck with indirect percussion. They generally exhibit evidence of overhang removal and have distinct bulbs or bulbs and lips.

Examination of butts, impact rings, eraillure scars, bulbs and striking lips shows that almost all regular blades were struck off the core by indirect soft-hammer percussion, while most irregular blades and flakes were struck by direct percussion, most likely with a hammerstone. Hard-hammer direct percussion, used to detach blades from a core, results in generally thicker blades and is strongly associated with the Late Mesolithic Ertebølle period, although some Ertebølle sites have a higher use of indirect soft-hammer technology.

Platform butts on both blades and flakes are with a few exceptions flat, but in 34 cases (of which 22 are blades) there is evidence of preparation of the front of the core, while such preparation was absent in 37 cases (seven were blades). Edge preparation work is done between striking off flakes or blades by gently tapping or rubbing the sharp, curving lip of the core platform with the hammer stone to trim it back. This technique was used to assure an exact blow was delivered to the striking area.

Four flakes and one coarse blade (4.4%) have more than 50% cortex[11] present, and can therefore be described as primary flakes, the first ones removed from corticated flint nodules. Thirty pieces had smaller amounts of cortex present (1-50%) The cortex was described as either "fresh" (n=12) or "worn" (n=21) and was in all cases thin (c. 1 mm).

Fifteen pieces displayed evidence of retouch or shaping, and included two flake scrapers, a Neolithic sickle blade and a polished Neolithic axe. In addition to these specific tool types there were also three truncated blades, one laterally

[11] The outer "skin" of a flint nodule or spall.

retouched blade and five “miscellaneous retouch flakes” (MRF), these are pieces that have retouch, but do not resemble any specific tool form. In total, 13.3% of the flint assemblage was attributed to a tool form or identified as an MRF.

A strike-a-light is made on a very thick blade of dark, grey Danien-type flint with flakes struck off from the distal end. Two or three broad, shallow flakes have been struck off (coincidentally?) from the blade’s steep sides. Six unretouched blades exhibit usewear and two of these have heavy usewear.

The most notable piece in the assemblage is a complete, Middle Neolithic thick-butted axe of the Lindø-type, dated 3000–2800 BC (Fig. 26). The sides of the axe are partially polished, except the third towards the neck.

Fig. 26. Middle Neolithic thick-butted axe of Lindø-type. Photo: Museum of Copenhagen.

The cutting edge is chipped and also appears rather dull in its present state. The axe is white-patinated but there are also areas where the patination is light grey. A few rust-spots can also be observed. It was found embedded in the natural sand subsoil and could have been lost on the former beach in the Neolithic. It is a quite common find in settlements of the period.

A circular flake scraper is made with inverse, short retouch on what appears to be a blade core platform rejuvenation flake. The scars from detached blades and evidence of overhang trimming are clearly visible on the platform butt of the scraper. It is probably of Neolithic date. Another scraper is a flake end scraper with linear retouch on the distal end. There is also a flake with distal, oblique retouch and a flake with lateral retouch. A flake has some distal, steep retouch and a possible notch on one distal lateral. A retouched flake with linear, steep retouch is a possible scraper. Finally, there is a blade-like flake with lateral retouch.

Of special mention is a bifacial, crescent-shaped sickle with a high, arched back. These are typical for the Late Neolithic period (2400–1800 BC), when there was a large-scale production of flint sickles of different forms. It was a tool type that remained in use until the end of the Early Bronze Age.

Unpatinated flints (n=35) exhibit a limited colour range, with shades or mixtures of grey and brown being the dominant colours. The remainder are a mixture of the above colours, with faint shades of yellow, green and blue included. There are two heat-affected lithics exhibiting colour change and hairline cracks. Burning probably occurred

prior to deposition. A majority of the lithics (72%) have been subject to some degree of patination resulting in a distinctive, chalky white colour. While most are still sharp-edged, a few appear to have experienced rolling in a marine environment, which has smoothed and rounded their edges through erosion.

Stone Age finds from central Copenhagen

The Copenhagen area comprises a rich cultural landscape with traces of human activity and habitation dating back to 10 000 BC. The vast majority of these places are situated beyond the old city and stem from the Palaeolithic (before 7000 BC) to the Bronze Age. Stone Age settlements, including submarine settlements from Kongemose culture are known at Frihavnen and beyond the coast of Amager. There are also Ertebølle settlements by Vedbæk, in Ordrup Mose, which was then a fjord, outside Kastrup at Amager, at Fredriksberggade and Fredriksholms quarters at Sydhavnen (Ramsing 1940, Vol. I:38 et seq.; Kjersgaard 1980:15; Christophersen 1985:12 et seq.). Some scattered archaeological evidence of prehistoric settlements is also to be found within the old city area. The occasional stray find has also been unearthed in this area. Caused by the Littorina Sea's distribution the prerequisites for Neolithic remains are extremely limited.

Archaeological investigations of the oldest historical Copenhagen has for many years held a naturally dominant position among archaeologists working within the city. In contrast, the study and observations of the city's prehistoric finds have been left significantly in the background. The discovery of a flint arrowhead from Rigshospitalet (the National Hospital) testifies to the fact that people have frequented the area for more than 12 000 years, but actual settlements seem to appear only from the later part of the Mesolithic period nearly 8 000 years ago with the finds from Frihavnen occupying a prominent position (Rosenkjær 1893; 1896; Andersen 1985).

In 1928 an article appeared with the first full description of finds from the prehistoric period in Copenhagen, Under Asfalt og Brostene, in which Kjær summarized the state of research at the time (Kjær 1928). In 1939, Troels-Smith discussed in some detail a number of Mesolithic sites on Amager and their relationship to shoreline displacement (Troels-Smith 1939). The following year, Ramsing could refer in his three-volume work Københavns Historie og Topografi to the new discovery of a worked antler from Middlegrunden, which for many years was considered the oldest find in Copenhagen (Ramsing 1940, Vol. I:38 et seq.). Ramsing's works continued to be central for an understanding of the city's prehistoric development and it is only in 1985 that Knud Andersen threw new light on the findings from Frihavnen (Andersen 1985:42 et seq.). The investigation – and subsequent fieldwork in 1991–1992 showed that there had been at least two settlements from the second half of the Mesolithic period. In 2004, trial excavations at Amager Strandpark revealed remains of a large Mesolithic settlement (Dencker 2006). Most recently Stensager has summarized the current state of knowledge regarding Mesolithic finds in Copenhagen (Stensager 2004).

More than 110 Stone Age find spots are currently known in the municipality of Copenhagen of which around 30 are find spots in the central part of the city. While most are single finds, there seems to be at least one Ertebølle locality at Nytorv/Frederiksberggade, 550 m SW of Kongens Nytorv (Københavns Sogn, Sokkelund Herred, Københavns Amt, SB nr. 14). In 1907, a blade core and two blades were found here at a depth of approximately 3.7 metres. In connection with archaeological excavations of the old town hall (also Nytorv) by Chr. Axel Jensen in 1937, 71 pieces of flint were collected, mainly larger blades and flakes and an edge flake from a core axe. Unfortunately, finds information is sparse and it is likely that the flints were merely casually collected during the course of the excavation. The existence of a settlement site at Nytorv was confirmed after the construction of bunkers just opposite the court house in 1944. On this occasion, 88 blades and flakes were retrieved. Although none of these works documented the exact position and context of the finds, there is little doubt that a settlement site was located on the beach under and around the later town hall. The flints are reported as patinated. The flints would be part of a larger complex which was lost in connection with the many conversions of the square. Other assumed settlement remains from central Copenhagen (the medieval parts) involving lithics have been retrieved at Amaliegade 13, Farvergade 15, Gammeltorvs Apotek, Kattesundet and Slotsholmen (Kjær 1928:112-113; Stensager 2004). Outside central Copenhagen, a significant assemblage from the Ertebølle period and the Neolithic period has been found at Frederiksholms Teglværk in

Sydhavnen (Larsen 1947). The Ertebølle flint was white-patinated while this was not the case for the Neolithic material (Stensager 2004:4).

A Late Mesolithic "activity spot" or camp site at Kongens Nytorv

Although it is not anticipated that there are significant remains of prehistoric date at Kongens Nytorv, there are low levels of activity in the form of residual artefacts. There may also be evidence of occupation as the site lies in an area surrounded by wetlands/marshlands. Locations similar to these can be places of preferential activity during the prehistoric period as they provide ample resources for hunting, fishing and foraging. Such satellite locations are well known from Mesolithic contexts previously.

The lack of a distinct Early Mesolithic component, such as microblades, microblade cores, microburins and microliths, suggests that most or all of the assemblage from Kongens Nytorv perhaps should be dated to the later part of the Mesolithic and to the Middle and Late Neolithic. Finds of flint tools and debitage have indeed shown that current central Copenhagen was visited or lived on, on several occasions during the Stone Age. The first visitors may have arrived in the area from around 6000 BC as attested, for instance, by the find of a rhomboid core axe from Fredericiagade, transverse arrowheads from Rådhuspladsen and the finds from Frihavnen. How the findings should be interpreted, we can only guess. Many recovered flints are stray finds and there is often uncertainty about the circumstances in which they have been found. This is the reason why potential settlement indicators, as fragmented as the material may be, are so significant when found within the urban environment.

Based on the current evidence, it seems certain that hunters moved along the former Øresund coastline and perhaps stayed at small settlements for short periods to extract food and other resources from the coastal environment, and to knap flint. Late Mesolithic find spots show a maritime preference both in terms of elevation and location for near-shore locations. Early and Later Neolithic find spots are located in the same areas, but generally these sites are found at higher elevations and more inland in relation to the coastline.

The displacement of the coastline became an important aspect of life during the Late Mesolithic and would also have affected the locality at Kongens Nytorv. It is unclear whether the flint was deposited in a settlement area with a subsequent light rearrangement during a sea level rise or whether the flint was transported within sediment transfers to Kongens Nytorv from a different location. A few lithics from the excavation have been found in geological layers, with one identified as a "transgression layer". Lithics from these contexts are clearly patinated, which lends support to the suggestion that at least some, if not most, lithics were originally deposited around Kongens Nytorv, despite the fact that many of the lithics later were redeposited into secondary contexts. There are no discernible differences in form and technology between the patinated and unpatinated flints. While no evidence of actual habitation sites belonging to the Mesolithic have been found in the area, the flints' marine-affected patina points to an origin within the zone affected by the sea level rise. The current evidence therefore seems to support the hypothesis that a Late Mesolithic "activity spot" or camp site proper at Kongens Nytorv was inundated and disturbed on one or several occasions by marine transgression (cf. Christensen 1995:15 et seq.).

The Neolithic site's location in the beach zone along with the lack of burnt flint or charcoal argues that the activities do not represent a main settlement and the vast majority of the worked flint belongs to this activity.