



Fig. 11.

*In connection with the conclusion of the restoration work in 2005 a minor archaeological investigation was conducted: five sondage trenches were dug in the area just east of the shipyard. Bente and Knud Christiansen and Hans Ole Hansen from the Lolland-Falster Amateur Archaeology Society are to be thanked for their dedicated help. Photo: N. Engberg, The National Museum.*

here was not filled up with stones. On the contrary, it had been covered with a 40 cm thick layer of clay. It was clear that the foundation for the east flank wall had been dug down through the clay layer. This is surprising and can only mean that, before the foundation for the wall was laid, they had had a solid wooden construction built. However, the wall was built in such a close connection with this construction that the two must have been included in the plans from the start. The many wood chippings and worked pieces of timber that were also found under the wooden construction evidently mean that the first thing that happened at the site – and before the flank walls were built – was the start of ship building. The layer with wood chippings etc. can only be the same layer that Marius Hansen examined in the area of the shipyard itself, between the flank walls. As already mentioned, Marius Hansen presumed this to be a way of strengthening the shore-line, but we now know that this was the remains of the first ship building on the site.

One of the excavation sites was placed across the embankment which from the door opening in the east wall led over to the area where Resen's Prospect suggests there were houses at least back until the 1680s. It is here, too, that the island's only farm lies today. Further out towards the beach is a broader embankment which today functions as a roadway and there is great uncertainty as to what the terrain looked like originally. Now it is clarified that infilling material, 7–8 metres wide, was deposited outside the east flank wall in the time of Christian IV, and in a trench dug nearest to the beach it could be established that the outer embankment was constructed of material that Marius Hansen and his school students removed when they uncovered the ruins in 1944–1947. The inner

embankment, however, was seen to be original, as Marius Hansen himself had supposed. Since the time of the castle there had also been direct access on the east besides the main entrance on the western side

### Restorations in 1985–2005 (Engberg and Frandsen 2006)

In 1985–2005, the ruins were extensively restored, which gave new insights into the building history of the castles and added new details. But first we must give an account of the restoration work and the considerations that lay behind it.

After excavations by Marius Hansen and the uncovering of the ruins, the walls were not protected in any way. In this situation the ruins were very vulnerable to the effects of wind and weather. The biggest problem was the great amount of water that penetrated the open walls. Frost had split the bricks and broken the ties, which are there to hold the façade together. In the course of time, woody plants had grown in the wall and their roots had worsened the damage. Further damage had been caused by the animals, which had been put out to graze in the area.

Preservation work began at Engelsborg in 1985 and a survey of the brickwork showed that the ruins were in a very parlous state. The worst damage was on the loose tops of walls as well as the tower's outer facing on the west where the effects of wind and rain were greatest. It was here that most original brick facing was preserved. The wall still stood up to a height of up to about two metres, but much of the pointing between the stones

had been washed away. Furthermore, a large number of the wall ties had broken and the facing of the wall had come loose and moved up to 1.5 cm away from the wall behind it. The facing that was still standing was now in great danger of collapsing. The top of the main tower was loose and water trickled through the lower part down to the arches over the gun loops making them unstable. The collapse of the high part of the top of the wall meant that the well-preserved traces of building of the tower gun-loops on the first storey, well preserved in 1947, had almost entirely disappeared. On the flank walls the gun-loops especially and the vertical sides of the walls were in a state of collapse. On the eastern wall there was a single gun-loop where the core of the wall was preserved. This part of the core was beginning to crumble and there was a danger that it would collapse. The construction details of the gun-loop on the western wall, of which only a few courses were preserved, were beginning to disappear because of the poor state of the brickwork.

Preserving ruins is a difficult task, not least because we in Denmark have the worst possible climate for free-standing ruins. We are thinking especially of our damp winters when for long periods the temperature vacillates around the freezing point and provides many cold snaps, as they are called officially. The many cold snaps combined with high humidity cause frost damage to ruins, in that the water in the brickwork expands about 10% when it freezes. It is therefore important to try to stop the walls getting too damp. At the same time, it is also important that the water that gets into the construction, through rising damp, for example, does not build up in the walls but can evaporate from the surface. The biggest problem is the top of the partly collapsed walls. The walls have most often a centre of mixed broken bricks, fieldstones and lime mortar. Tops of the walls were never thought of as an upper ending of the wall and they are very exposed to rain penetration. They can be secured by putting a new layer on top of the original wall. This is called a "sacrifice layer" because it is unavoidable that it breaks down over the course of a number of years, but any new damage occurs to this layer and not to the original brickwork.

The intention is also that the preservation work should strengthen communications. This happens partly through the building archaeological investigations which take place before and during restoration work, but also afterwards. This occurs when one considers that a ruin can be more easily understood when missing walls are marked by f.x. turf.

The restoration work on Engelsborg began with stabilising the wall facings of the tower so as to preserve as much of the original wall as possible. As mentioned, the wall facings had come loose from the core and in order to provide an anchor, some of the broken ties were temporarily removed so that stainless steel anchors could be bored into the wall core. To stop water penetrating in

the gap between the facing and the core, the top course was bricked up so that the gap was sealed off. Finally, the facing was pointed with a mortar separate a little from original mortar. The section that had fallen down was reconstructed from the clear traces of the run of the brick courses on the wall core.

The gun-loops at first-storey level had almost entirely disappeared. They were only visible as an impression of the mortar from the missing bricks together with a few remaining cracked bricks in the wall core. After careful cleaning and subsequent measuring up, it was possible, with two of the gun-loops, to reconstruct parts of the lowest courses as well as the mortar base of the gun-loop. Originally, there must have been six gun-loops on the first storey of the tower. The nine gun-loops on the lowest storey had barrel vaulting and a recoil beam was situated in another course over the mortar base. The gun-loops on the first storey seem to have been constructed like those below; however, no recoil beam could be perceived in the preserved core. The recoil beam was perhaps only lightly cemented into the wall core as is also the case in one of the lowest gun-loops.

In all, traces of 14 gun-loops are preserved in the two flank walls. In ten of these only the loop's base or parts of the lowest courses remain in place or traces of mortar that indicate where they were originally situated. Loose bricks were cemented up and subsequently the sides of the gun-loops were reconstructed following the preserved traces of mortar. The broken down bases were renovated so that the rain penetration could be minimised. An interesting detail of construction could be seen in the gun-loops. One brick was set in the core level with the base and placed such that it could be used to set up the bricklayer's string when the first course of the sides of the niche was to be laid.

In the anteroom to the tower in the eastern wall it was possible to reconstruct the gun-loop in its full size, from the preserved traces of building supplemented with details from the two best-preserved gun-loops in the west wall. The gun-loops in the flank walls are constructed in a very different way from those in the tower. They consist of a 1.1 metre wide and 1.5 metre high niche arched circa 0.6 metre above the inner base and finished at the top with a round arch. In the outer wall of the niche sit three brick courses over the base of a narrow bevelled gun-loop. The recoil beam is placed in the loop's bevel, flush with the inner side of the niche. New brickwork in the gun-loop and on the south wall facing around the gun-loop was undertaken only in the area where it was considered necessary to stabilise the original brickwork. A recoil beam was again set in the gun-loop. The new brickwork stabilised and also provided the opportunity to give a better impression of the sidewall's gun-loops.

Engelborg's original recoil beams have long since disappeared and today only the holes remain. If one looks

more closely at these holes, one can see that part of the original beam used recycled timber. This can be seen in some of the tower's beam holes where an impression of the wood has been left in the mortar. Some of the pieces of wood had dowel holes and in one of the western flank walls there is an impression in the mortar of a lengthwise groove in a piece of timber measuring 18 × 28 cm. The groove is on one of the broad sides of the timber. It has an upper width of circa 4 cm, a lower width of circa 2.5 cm and a depth of circa 5 cm. The side that has the groove in it has slightly sloping sides with rounded corners. There was probably a corresponding groove on the other side of the timber. This recycled timber may originally have come from a wooden house where it was one of the upright posts into which the horizontal planks were dropped.

It is clear that west of the doorway in the eastern wall there was a kind of niche. Earlier it was considered whether this had a function connected with the doorway, a space for a guard for example, or a special defence for the door. What was left of the sidewall in this niche was unsupported and was in danger of falling down. A foundation had to be built. The base of the niche was found to be loose, and one metre down a stone circle appeared. This was found to be the remains of a well placed roughly in the middle of the wall. The well measures one metre in diameter and consisted of hewn sandstone with courses of varying heights. The six lowest courses have remained which give a height of 1.1 metres. The preserved part of the well lies under the natural water level. The well was partially cleaned out and it was found that the lower 1/2 metre was filled with a compact layer of organic material – presumably eelgrass and branches. This material could also be observed under the lowest stone circle in the well. Possibly it is natural sediment of the beach in which the well was placed. In the loose filling in the well a dressed sandstone was discovered, which shows that the wall was built of sandstone all the way up. Sandstone was valuable and at the time of Engelsborg's decline it was removed down to the water level. We have no knowledge of any other fortified buildings in Denmark with a well built into the wall as it is here at Engelsborg. The choice of this particular placing may be due to the fact that the space between the flank walls was limited and placing the well in the body of the wall removed it away from the naval shipyard's other functions. In order to support the remaining wall in the "well niche," a brick foundation was built from the upper edge of the well up and out to the remaining visible walls. The site of the well in the niche was marked with a piece of dressed sandstone that was found separately, supplemented with fieldstones.

The mutual distances between the gun-loops on the flank walls vary between 1.35 metres and 2.73 metres. This straight away seems strange because when the walls were built it would have been easier to set the gun-loops the same distance apart from each other. The difference

could be a sign that the gun-loops should fit in with something that was already built in the space between the flank walls. It could indicate that the naval shipyard was under construction or perhaps already in use when the flank walls were built. In the northern part of the western flank wall, about 24.5 metres from the gateway, some brickwork was found which might have been a temporary end to the wall.

The flank walls' original facing has remained at the height of a few courses only. During the restoration, new brick courses were cemented on top in order to secure the facings. The bricking up also secures the core of the wall that lies behind. The top of the wall was secured with a "sacrifice layer" consisting of material matching that of the original core. In order to be able to reconstruct the brick courses over the wall facing the remaining broken brick ties, which could still be seen in the core, were registered and from here on it was possible to continue bricking with the original bond.

## Conclusions

The pieces are now in place, which can provide a more detailed picture of the history of the buildings and shipyard at Engelsborg. The international political situation in the first decade of the 16th century was strained and complex. Officially the Swedes, considering the Kalma Union agreement, were regarded as rebels and King Hans had persuaded all – including the Hanseatic states – to take part in a commercial blockade of Sweden. The Hanseatic states were already in a tight situation in that King Hans had agreed that Dutch, English ships and so forth, which were now on a large scale, could trade freely in the Baltic. In 1508, he understood that it could only be a question of time before there would be an actual war with the inhabitants of Lübeck and their allies among the other Hanseatic states. And he knew that if the war was to be won it would be at sea. There was a need, therefore, for a powerful fleet for which actual warships would be required. This is where Engelsborg comes into the picture. It lay well sheltered in Nakskov fjord, but nevertheless close to the centre of events in the Baltic. At that time there was passage only through the original narrow and winding fairway in the fjord and navigation required detailed local knowledge if ships were not to run aground. In addition, the channel was only eight metres deep where it passed close in to Slotø's north beach.

King Hans acquired the island in 1508, or perhaps not until 1509, and, as the latest excavations show, they began with the most important thing: building ships (Hocker 1999). Next – and we are talking about a period of weeks or months at the most – they built the two strong wooden constructions that anchored the slipways on the shore. Now they could careen and repair ships in the shipyard. Next after that they began the building of the V-shaped

flank walls that were to protect the shipyard. Most probably, they were already engaged in building the tower, because in the rubbish with the wood chippings there were found also a few pieces of tile. But there is no doubt that the whole installation was part of one and the same plan. It is unlikely that it was possible to complete the building of the tower and flanking walls in the course of just two years, as is generally the case. The building season in Denmark is too short for that when one is working with lime mortar. One cannot lay bricks in frosty weather, that is one can begin in May and must finish at the latest at the beginning of September so that the lime mortar can go off before the frost returns. Today it is reckoned that, even with many bricklayers on the scaffolding, at least four years would have passed before the last stone was laid. This did not stop the building of the “Engelen”, the “Maria” and others ships forging ahead. Actually, when the walls were built they must have taken into consideration the functions of the buildings and so forth and their links to the shipyard.

The gun-loops, for example, were not introduced regularly and this can almost only be explained by the fact that the shipbuilding installations stood in the way and shipbuilding took precedence over everything else. That was what Engelsborg was about first and foremost.

Before they began to build the flank walls, the moat around the tower was dug out. The clay from this must have been used to cover the wooden constructions for the anchoring of the two slipways and the clay supposedly was used also to cover those parts of the shipyard area that needed to be built up. Clay from the moat was also used for the embankments which, west and east of the flank walls, respectively, stopped the water from the moat running into the fjord and at the same time allowed access to and from the castle. The main entrance was from the west in the western flank wall but the smaller door in the eastern wall was also important. It was here that one went, via the embankment, to the area where the island's inhabitants lived. The king's bailiff, his family, and his officials lived here, not in the castle, which with its 29 square metres ground plan only had room for the defenders. The soldiers and shipbuilders also lived in the area to the east of the castle itself. It is reckoned that there were about 50 men who manned the defence of Engelsborg. All of them were hardly on the island constantly, but there must have been some occupation. No buildings are known. Farms cover the area today and it has been impossible to undertake archaeological investigations here.

The tower was constructed with nine strong bevelled gun-loops below and six above. There were hardly more storeys in the tower; in any case from the upper storey one could easily observe the ships which were drawing close to the island and one also had a clear overview from up here of the terrain of the island itself. In the flank walls there were traces of 14 gun-loops, in all – ten in the west

that would cover an enemy sailing in and only four in the east. The wall here is so badly preserved that gun-loops may well have disappeared without our being able to find any trace of them. In several of the gun-loop's sides, about 0.6 metres from the ground, there are traces of the holes for recoil beams. The wood has long since rotted away but impressions in the mortar of several of them show that they could have been made from recycled timber. The cannon tower at Engelsborg was apparently the first of its kind in Denmark and for years Engelsborg was the land's most modern fortress.

In addition to the castle there is also a high and strong rampart on the outer side of the moat. The south-western part of it is still preserved and the material for rampart building came from the digging of an outer moat. It is still visible in one place. It is still an open question whether it – as shown on Resen's Prospect – was linked directly to the fjord, thereby cutting off Engelsborg completely from the rest of the island.

On the administrative level Engelsborg lost its great importance when, in 1523, it was given up as a royal fief. That was the year when Christian II fled on the ship “Maria”, one of the two first ships built at Slotø. Apparently, the shipyard remained active until the inhabitants of Lübeck attacked and conquered Engelsborg in 1534. After this there is a remarkable silence about Slotø. Engelsborg must have been abandoned as a fortress after it was conquered. Perhaps there is a grain of truth in the stories that it was badly damaged. Or the facts are perhaps less dramatic. In 1536, the civil war ended, the reformation was established and, with King Christian III at the helm, the country entered a much more stable political period than before, both at home and abroad. However, the most important reason must have been that there was no longer a shipyard to defend. Thus, Engelsborg only functioned as a fortified shipyard for 20 years.

In 1588–1631, the island was added to the widow Queen Sofie's jointure and it seems as if the only inhabitant was a “keeper” with some servants. It is not difficult to imagine that the walls of the tower and the flank walls became dilapidated at that time and some of them actually collapsed. In any case it was clear during the last excavation that, when Christian IV ordered that the shipyard should function again, the walls were reduced to a certain height and the pieces of brick and so on were laid out as building material in an area outside the east wall and around the tower. Work sheds, light workshops, were set up in the area. The written sources list buildings for 43 trades. There was insufficient room for them all here and the rest must have been erected in the area east of the shipyard where the island's dwellings seem to have been situated. The shipyard functioned for ten years after which the island was again abandoned and quickly sank back into its status as farmland. Usable parts of the buildings and building materials were transported

to Nykøbing Castle. Memories of Engelsborg, the estate, the shipyard and the fortress, quickly faded and, in the 17th–18th centuries, the place became a picturesque ruin used by the locals as a place for excursions.

### In 1945, war came to Slotø again

World War II was a turning point for Engelsborg. Marius Hansen used the particular interest in all things Danish in those years to have the ruins excavated and to examine archaeologically the remains of King Hans' shipyard. And once again Slotø was selected for attack. It began at 7 p.m. on 3 May 1945. Nine Canadian Mosquito jets had orders to sink two freighters that lay anchored out from the ruins on Slotø (Fig. 12). One of them was a ship that during the Korean War became known as the hospital ship "Jutlandia". On a farm beside the ruin there lived the Henriksen family. The father of Johan – who in all the years from 1985 onwards has been the bricklayer for the restoration of the ruin – heard the aeroplanes in the distance and went over to the ruin with his binoculars, to see what was going on. Suddenly the aeroplanes were there and it was apparent that the attack was in part taking place over the farm. The father had to seek shelter in



Fig. 12. On the outside of the eastern flanking wall at a depth of one metre there lay a large wooden structure which helped to stabilize a careening place – the platform out in deep water where the ships could be careened, i.e. turned on their sides during repairs of the bottom and sides. Photo: N. Engberg.



Fig. 13. In 1984, by the overgrown ruins of Engelsborg, an informative notice was set up. In 1985, repairs of the masonry began. Photo: K. B. Vesth, The National Museum.

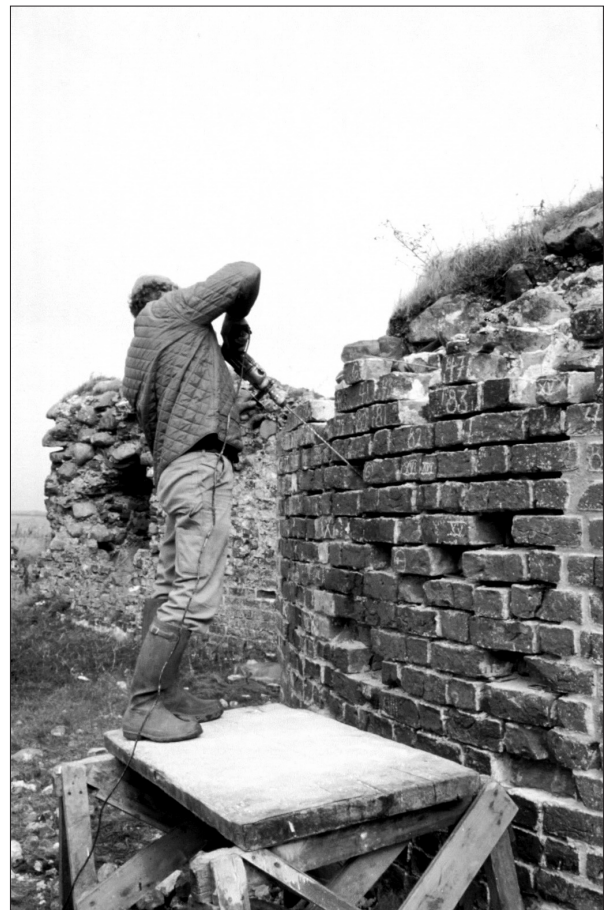


Fig. 14. The master mason Johan Henriksen drilling in the wall core to mount the masonry anchors. The masonry anchors fix the original facade wall to the wall core. The facade bricks are numbered, so that bricks that have been removed can be reinstalled in their original places. Photo: J. Frandsen, The National Museum.

Fig. 15. Canon loops in the western flanking wall after repairs. The original, high wall core has been waterproofed. New medieval-style bricks have been laid on the facades of the flanking walls and in the poorly preserved canon-loops. The new bricks have been placed in accordance with reliable traces in the mortar. Photo: J. Frandsen, The National Museum.



Fig. 16. The inner side of the partly reconstructed embrasures with a recoil beam. When the embrasures were originally used, the beam absorbed the recoil from the arquebus, which had a hook that engaged with the outer edge of the beam to absorb the recoil. Photo: J. Frandsen, The National Museum.

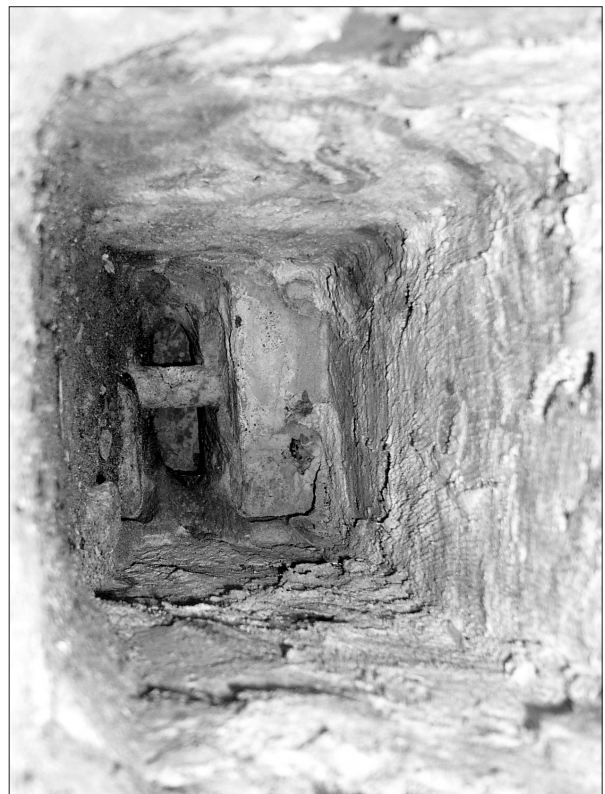


Fig. 17. A look into one of the holes where the recoil beams were originally placed. The wood has long since rotted away, but the preserved impression of the beam in the mortar reveals that the timber had a scarf on the inside. One can see that the bottom part of the timber was the longest. The timber joint would have been made with a mortise. The hole was filled with mortar when the timber was built into the embrasure, and can now be seen as a free-standing mortar cylinder. Photo: J. Frandsen, The National Museum.

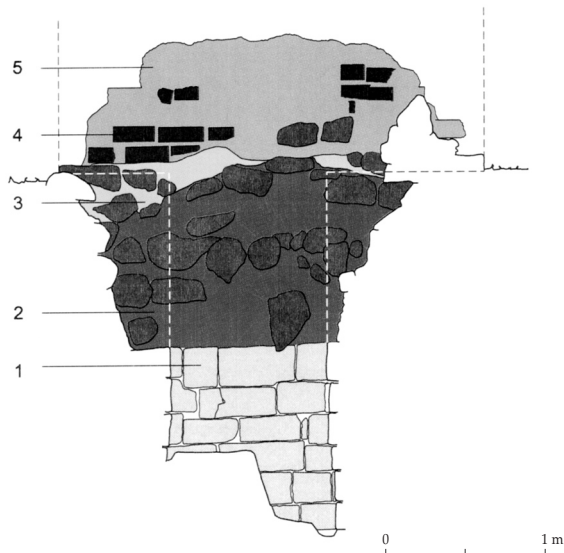


Fig. 18. Cross-section through the eastern flanking wall showing the preserved part of the placing of the well in the middle of the wall body. 1. Cross-section through the preserved part of the well. 2. Demolition layer and parts of the wall foundations. 3. Foundations laid in mortar. 4. Preserved facade bricks in the eastern inside alignment of the wall facade around the well.

Il: S. Brandt, J. Frandsen, *The National Museum*.

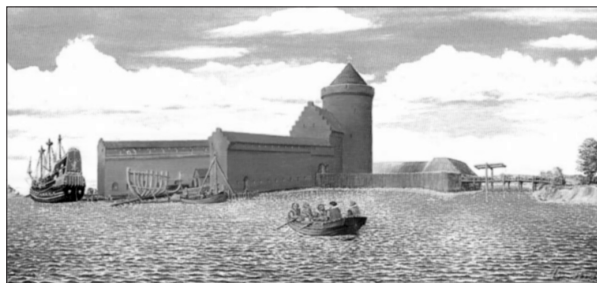


Fig. 19. The shipyard and fortress complex of Engelsborg, as a local artist, Børge Larsen ("the Dairyman") imagined it must have looked in its prime. On the right of the picture, a bridge across the inner moat, and a dam that went on past the inner moat to the gate in the western flanking wall. In the reconstruction the tower has been given three storeys and the flanking walls a closed upper storey. The last of these is a rather unlikely construction, but there were undoubtedly gun platforms of wood up here. The tower is unlikely to have had more than two storeys. The overall impression as rendered here, however, gives a good idea of the imposing sight that must have greeted the seamen of the age when they approached Engelsborg from the sea.

Ill: Nakskov Skibs- og Søfartsmuseum.



Fig. 20. On 3 May 1945, at 7 p.m., nine Canadian Mosquitos attacked a couple of freighters that were anchored in the fairway off the ruins of Engelsborg. The Allies were aware that the war was drawing to an end and wanted to prevent the Germans from using the ships in connection with an evacuation. The operation succeeded, but the ships could be repaired afterwards, and one later became known as the "Jutlandia", and functioned as a hospital ship during the Korean War. Photographed from one of the attacking fighters. Photo: Frihedsmuseet.

the ruins of the tower whilst shells exploded all around. Many hit their target and the ships were so badly damaged that they could not sail. One of them sank. It was shells that hit the farm too. It burnt down, but what was worse was that the two boys ran out into the farmyard in a panic. They were hit by shrapnel and received serious burns and spent four months in Nakskov hospital. World War II finished, as far as Denmark was concerned, at 20.40 on 4 May 25 hours and forty minutes after the attack on Slotø (Engberg and Frandsen 2006).

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