THE ORGANOLOGY OF THE QUEEN MARY AND LAMONT HARPS

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Part II. Construction

Chapter 3. The Lamont Harp

As discussed in Part I of this dissertation, there are aspects of the construction and repair of this harp that do not appear to be straightforward, for example the mismatched number of tuning pin holes and string holes, as discussed in the stringing section of this dissertation. Examining the surviving evidence on the instrument may provide some clues to how it came to be in its current form, and help us to gain a deeper understanding of its construction.

Forepillar

This examination of the construction of the Lamont harp begins with the forepillar, which has suffered very visible damage and repair, as discussed in Loomis (2010).[222] Further examination of the CT scans of the forepillar has revealed additional damage and repairs, which are discussed below in the context of its construction.

Figure 3.1 (overleaf): *the forepillar of the Lamont harp, viewed from the right and left–hand sides of the harp. Photographs: Maripat Goodwin.*

[222] Loomis, *Structural Breaks and Repairs,* 23 – 28. See also Loomis et al., "Lamont and Queen Mary Harps," 119 – 20, and Armstrong, *Irish and Highland Harps,* 165.

Damage and repair (further to Loomis 2010)[223]

The most prominent apparent repair to this member of the frame is the scarf joint just below the T-section, where the lower portion has been replaced, as can be seen in the photographs in figures 3.1 and 3.2.[224] The forepillar is depicted with this repair in the earliest engravings of the Lamont harp, in Gunn's 1807 report.[225] Crushed wood at the back of this joint and the opening up of the front of it indicate that the harp was brought up to tension after the repair was made.[226] This suggests that it dates to the working life of the instrument, however damage due to a post-historical restringing cannot be ruled out.[227]

Figure 3.2: *the scarf joint on the Lamont harp forepillar, viewed from the front. Photograph: Maripat Goodwin.*

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[223] Loomis, *Structural Breaks and Repairs,* 23 – 28.
[224] Armstrong, *Irish and Highland Harps*, 165 – 66; Simon Chadwick, "The Lamont Harp: Damage and Repairs," accessed 7 August, 2014, http://www.earlygaelicharp.info/harps/lamontdamage.htm, (a newer version of this web page does not explicitly mention the scarf joint); Loomis, *Structural Breaks and Repairs,* 23 – 28.
[225] John Gunn, *Historical Inquiry*, plates I and III.
[226] Chadwick, "The Lamont Harp: Damage and Repairs." See also Armstrong, *Irish and Highland Harps,* 165. Armstrong points out that the two pieces of the forepillar must have pivoted when the harp was brought back up to tension. This would have caused the joint to open up at the front and pinch together at the back, as observed.
[227] Keith Sanger has suggested that the Lamont harp might have been restrung in the early 19th century. See Keith Sanger, "The 'Lamont' Harp," accessed 11 May, 2014, http://www.wirestrungharp.com/harps/lude/lamont_details.html.

Upon close examination of tomograms taken from the CT scans, it appears that most of the shafts of the rivets joining the two pieces of the forepillar are bent and/or damaged. Figure 3.3 shows a photograph of the rivets in the forepillar and how they appear in cross-section on the tomograms.

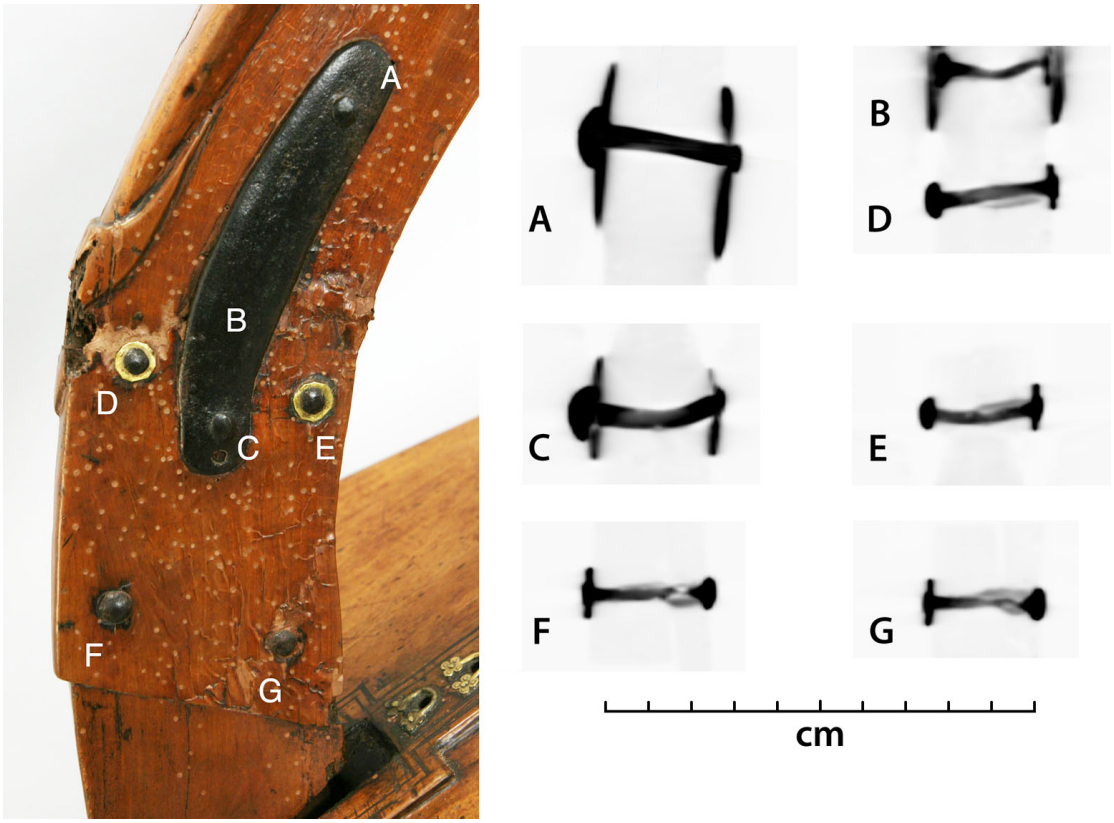


Figure 3.3: *iron rivets in the join between the upper and lower sections of the forepillar. The tomograms on the right show the condition of the shafts. The shaft of the top rivet, labeled 'A', is the only one that does not appear to be compromised. The others are either bent or have cracked. Although not visible in this figure, the head of rivet 'C' has partly sheared off. The scale for the tomograms is 1 tick : 1 cm. Photograph (left): Maripat Goodwin; annotations by the author.*

The lowest four rivets, labeled D, E, F, and G, are split along the shaft in multiple places (with the exception of E which has one large split). It also appears that the shafts may have some corrosion. This could be the result of exposure to moisture

when this harp was stored at Dalguise in the 19th century.[228] The shaft of rivet C is bent towards the front of the forepillar and its head has almost completely broken off. Rivet B, which is hidden behind the iron strap, is bent in the same direction. Although it doesn't appear to be cracked or split, it does pass through an internal crack in the wood, so is not actually functional. Rivet A is the only one that appears to be completely sound. This is also the only rivet that doesn't pass through the scarf joint. The other rivets probably bent as the joint opened up when the harp was brought up to tension. Given the apparent state of these rivets, it looks as though there may not be much holding the two pieces of the forepillar together. Although there is no longer any string tension on the frame, the forepillar does support some of the weight of the neck. In light of this it would be advisable to assess the stability of the forepillar join from a conservation standpoint.

Although the join between the two sections of the forepillar has been discussed previously, the repair to the joint with the soundbox has not. Upon initial examination, it appears that the replaced lower section of the forepillar does not match the dimensions of the mortise in the soundbox. Figure 3.4 shows the soundbox where it joins with the lower section of the forepillar.

[228] An early 20th-century archival photograph of the harp shows water drip marks on the forepillar. National Museums Scotland "Lamont Harp archive," H. LT2.

Figure 3.4: *the forepillar/soundbox joint of the Lamont harp (arrowed). It is the replaced lower section of the forepillar that joins with the soundbox. Upon initial inspection, the dimensions of the forepillar do not appear to match the soundbox mortise, which has been enlarged on one side and shimmed at the front end. The front of the forepillar has been chiseled to create a flat surface to press against the shim.*

As can be seen in the photographs in this figure, the soundbox mortise has been enlarged on its right-hand side and has been shimmed at the front end. The front of the forepillar has been somewhat crudely chiselled to create a flat surface to press against the shim. This seems odd, considering the apparent care that was taken in matching the dimensions of lower section of the forepillar to the upper section at the scarf joint. Examination of this joint on tomograms from the CT scans shows that the dimensions of the tenon and its shoulder, versus the mortise and its recess do agree, at least in terms of width. The mortise recess has been cut into on one side to accommodate misalignment of the forepillar. This can be seen more clearly in the two views of the joint shown in figure 3.5.

Figure 3.5: *two views of the forepillar / soundbox joint of the Lamont harp. The width of the mortise and tenon (including the tenon shoulder and mortise recess) do agree. The mortise recess has been enlarged on its right-hand side to accommodate misalignment of the forepillar.*

This dimension of the repair is therefore consistent with it having been made for this soundbox. In the long dimension, the tenon and its shoulder are each over a centimeter shorter than the mortise and its recess, however. This is noticeable in the photographs of the joint in figure 3.5. This discrepancy can be entirely accounted for by the change in the angle of the forepillar to the soundbox due to the decreased distance between the end of the neck and the soundbox as the neck has pivoted forwards. Based on the calculated change in string lengths for the Lamont harp, the straight-line distance between the top and bottom end of the forepillar is 5 cm shorter than it was originally. Some of this shortening is taken up in bending of the forepillar, however the lower section of the forepillar was also made short to compensate for the decreased distance.

At the top end of the forepillar, where it joints the neck, there is another repair that was not discussed in Loomis (2010), as it was only noticed after a careful reexamination of the CT scans of this joint. Examination of the joint in this location is somewhat complicated by interference from the metal end-cap, cheekbands, and straps, although it is possible take cross-sections that show details of its interior. As discussed in Chapter 2 of this dissertation, it is possible to see the forepillar tenon inside the neck joint and to see the tuning pin holes that pass through the tenon. Close examination of the tomograms of the neck/forepillar joint revealed that, in addition to the current line of tuning pin holes piercing the tenon, the end is scalloped by what appears to be the remains of a second line of holes, 1.7 cm above the current ones.[229] This can be seen in the tomograms of the joint in figure 3.6.

[229] Loomis et al., "Lamont and Queen Mary Harps," 120.

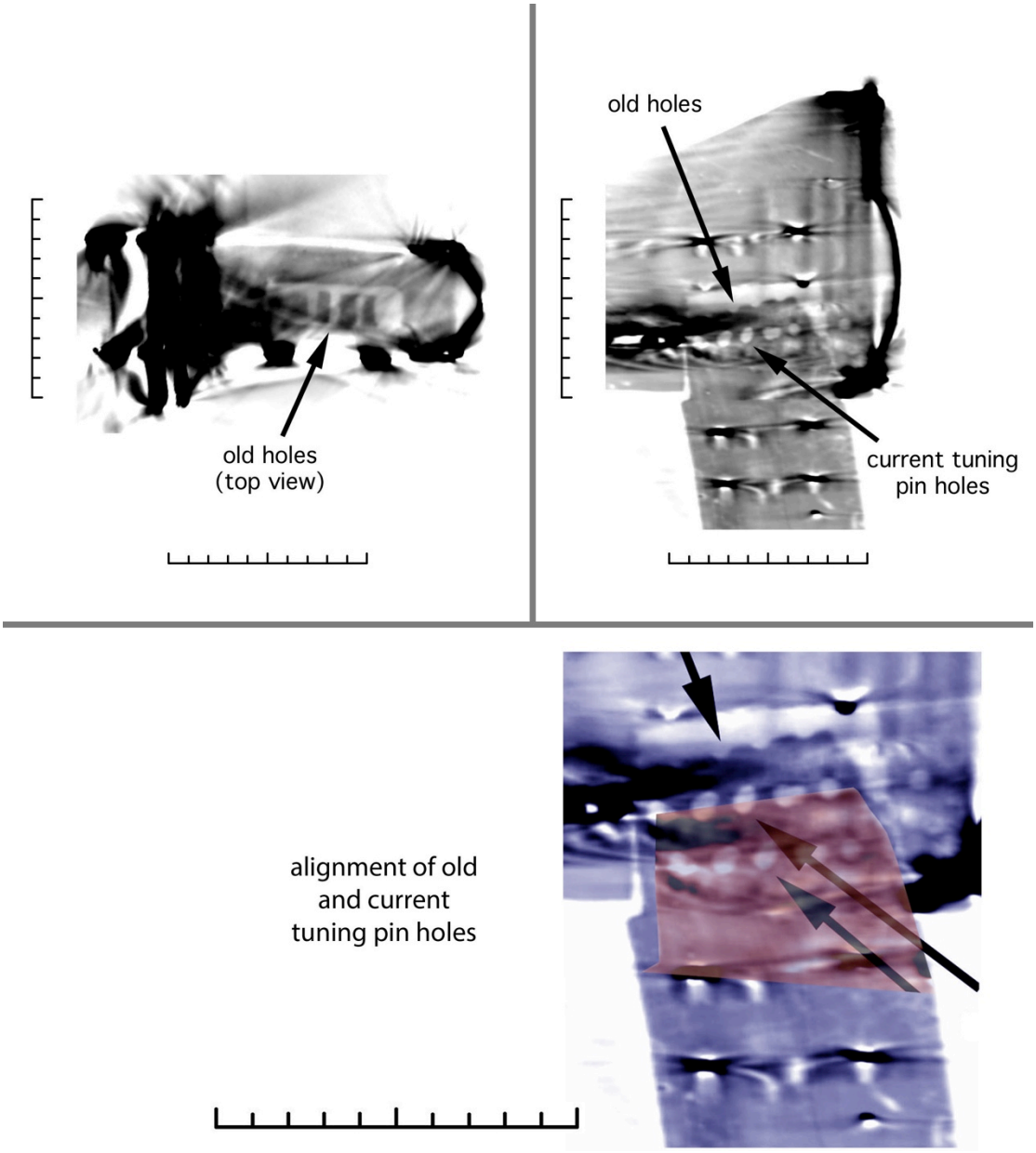


Figure 3.6: *Tomograms of the forepillar tenon of the Lamont harp in the neck joint. At top left is the view looking down from above the end of the tenon, and at top right is the view from the side. The remains of what appears to be a second set of tuning pin holes are visible on the end of the tenon in both of these cross-sections. The composite image at bottom right has a copy of the image of the end of the tenon overlaid on itself (shown in a contrasting colour), but shifted to show the alignment of the two sets of holes. Scale 1 tick : 1 cm.*[230]

[230] An earlier version of this figure appears in Loomis et al., "Lamont and Queen Mary Harps," 120.

Measurements taken off the tomograms of the tenon show that both sets of holes are spaced 12 mm on centre. The second line of holes lies at an angle of 3° to the current set, consistent with their separate locations on the arc of the forepillar. A possible explanation for this feature is that the end of the tenon sheared off through the perforations created by the original line of tuning pin holes. Instead of replacing the forepillar, the tenon shoulder was re-cut and reseated in the joint, and a new set of tuning pin holes was bored through the tenon below the original set.[231] The lower image in figure 3.6 demonstrates that this was likely the case by overlaying a copy of the image of the end of the tenon onto itself, shifted downward and rotated 3° to show the alignment of the two sets of holes on the forepillar. Misalignment of the holes, either in their spacing or their position on the forepillar, would have indicated that the upper section of the forepillar had previously been on a different harp. Their alignment, however, shows that this was probably not the case.

The sheering off of the end of the tenon could have occurred as a result of the string tension causing the neck to rotate towards the left-hand side of the harp, or it could have occurred as a consequence of the break lower down on the forepillar. If that break had been a sudden catastrophic event, the upper part of the forepillar would have swung downwards, forcing the forepillar tenon to rotate in the neck joint. Because the tuning pins that pierce the tenon are fixed in position in the neck, the tenon would have sheered off through the tuning pin holes.

Cross-sections

Figure 3.7 shows a tomographic cross-section of the forepillar. This is actually a composite of three cross-sections, one for the middle of the forepillar, and separate cross-sections for the ends. In order to show the complete forepillar, this was necessary because it is bowed in the middle towards the right-hand side of the harp. The lines labeled A – E indicate the locations of cross-sections taken across the forepillar. These are shown in figures 3.8 – 3.12. For all of these figures the grey-

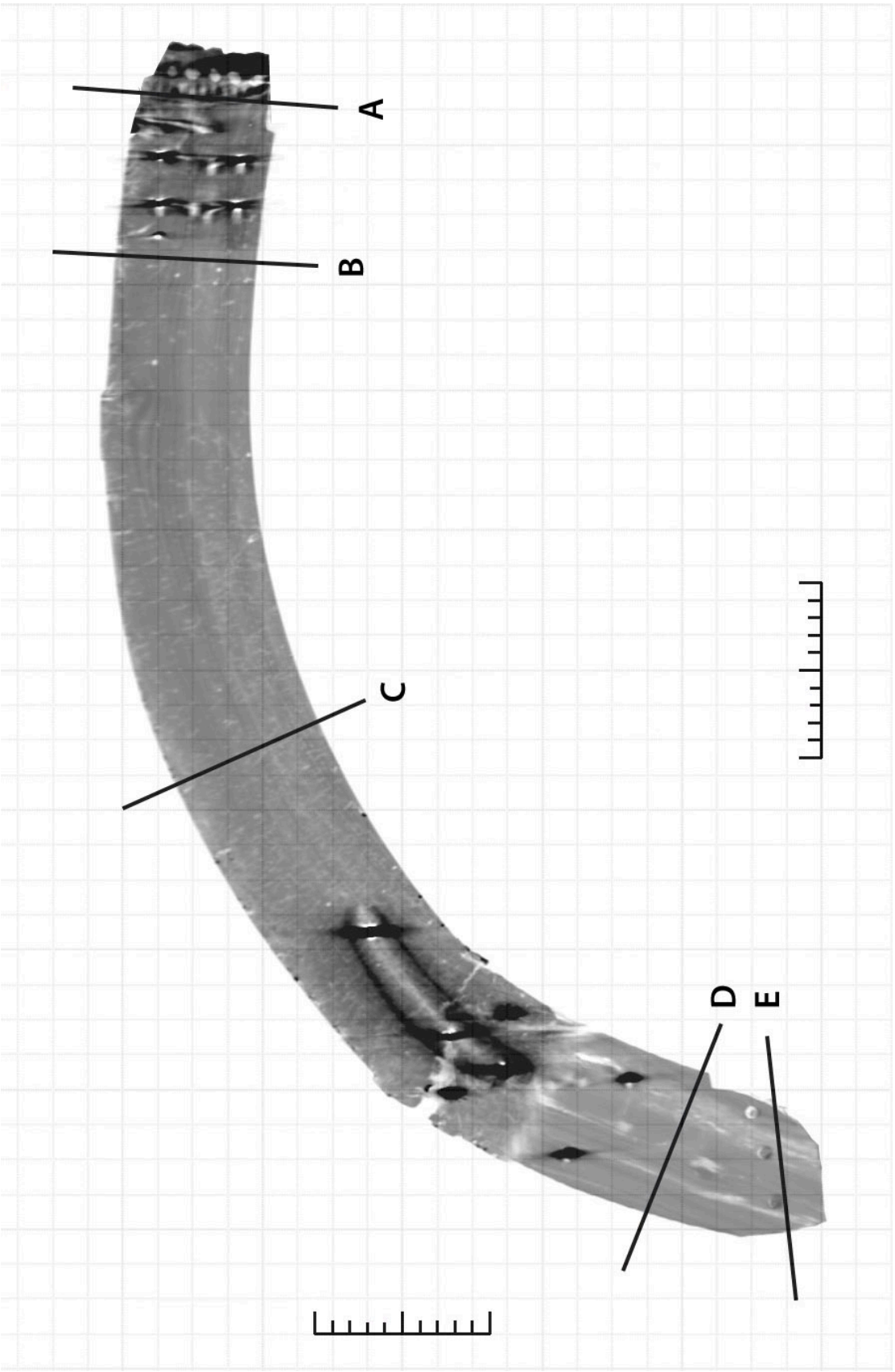
[231] Loomis et al., "Lamont and Queen Mary Harps," 120.

scaling has been set so that the edges of the image of the forepillar are located at its actual physical edges. This has been done so that the dimensions of the forepillar are accurately represented in the figures.

The location of the physical edge was determined by plotting the voxel counts across the edge and locating the point midway between the lowest and highest value. To accurately measure an object in cross-section, the width is taken as the FWHM (full width at half maximum) of the profile of the cross-section. This is the method used throughout this dissertation for measurements taken from the tomograms.

For the cross-sections in figures 3.8 – 3.12, the coloured line in the left-hand image indicates the location of the cross-section shown on the right. The green lines on the measured cross-section on the right indicate where the measurements were taken. The right-hand side of the harp is on the left in each of the measured cross-sections, as indicated in the figures (the view is from the perspective of 'looking up' the forepillar from below). Any image artefacts are due to the metal fittings in the vicinity of the cross-section.

Figure 3.7 (overleaf): *composite tomographic cross-section of the forepillar of the Lamont harp. The lines A – E indicate the locations of the individual cross-sections shown in figures 3.8 – 3.12. The neck joint is located at upper-right and the joint with the soundbox is located at lower-left. Scale 1 tick : 1 cm; grid scale 1 square : 2 cm.*


A
B
C
D
E

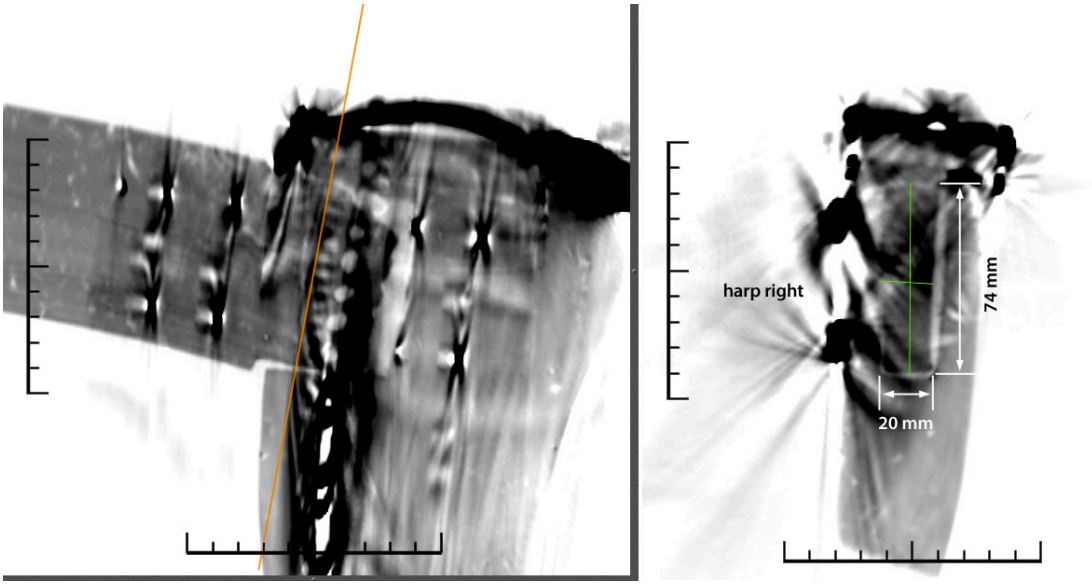


Figure 3.8: *Lamont forepillar cross-section A (see figure 3.7). This is a cross-section of the tenon in the neck joint. Although the image artefacts make it difficult to discern, it appears in the left-hand image that the tenon has no shoulder on the side facing the end of the neck. Scale 1 tick : 1 cm.*

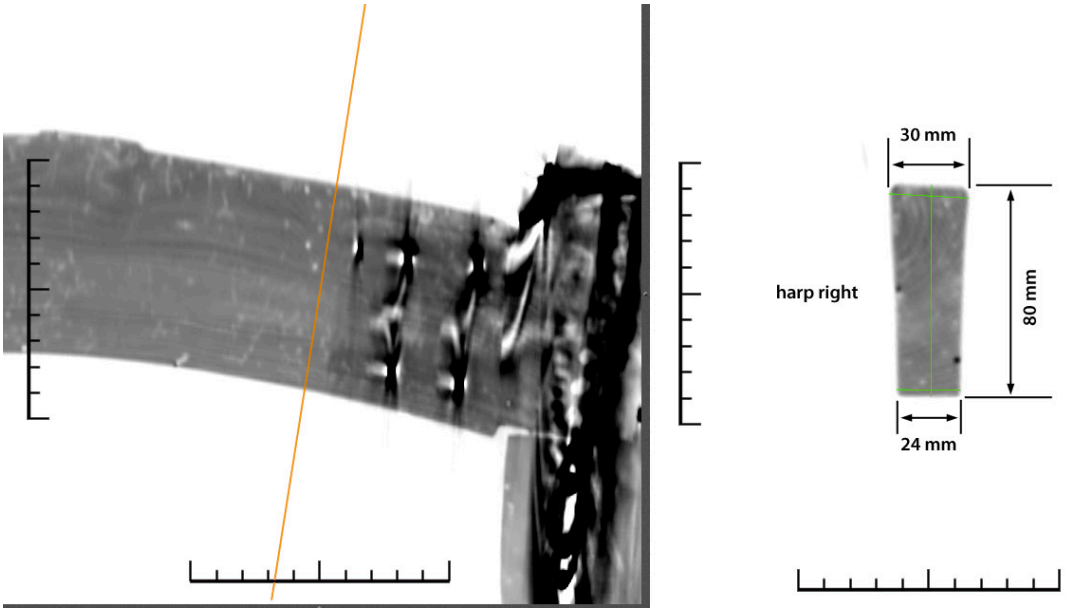


Figure 3.9: *Lamont forepillar cross-section B (see figure 3.7). Note that the forepillar is slightly wedge–shaped. In the cross-section on the right the visible wood growth rings indicate that the centre of the timber is just off the upper right–hand edge of the forepillar. Scale 1 tick : 1 cm.*

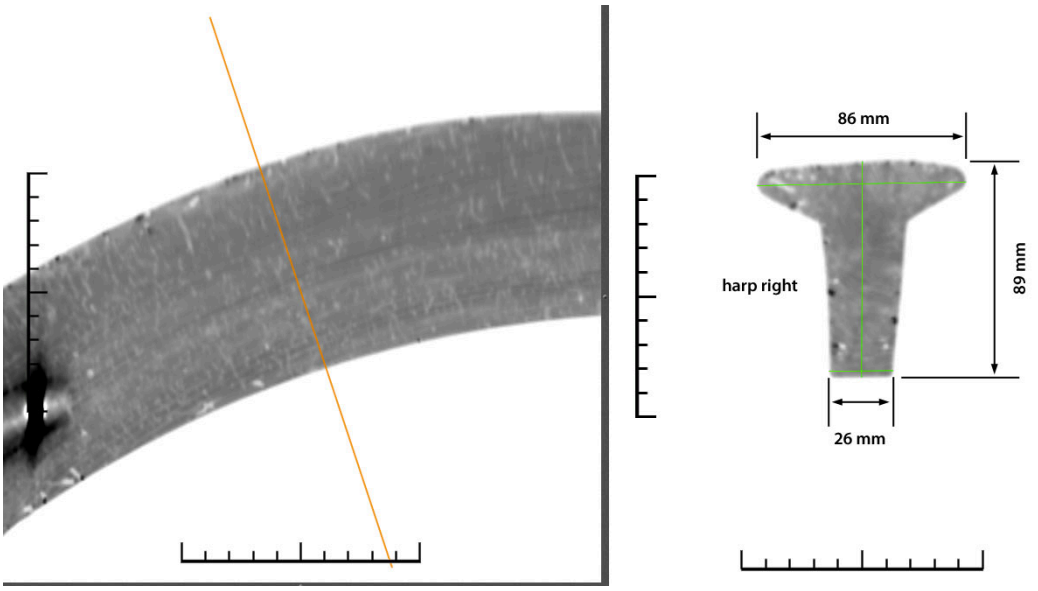


Figure 3.10: *Lamont forepillar cross-section C (see figure 3.7). This cross-section is at the mid–point of the t-section. Scale 1 tick : 1 cm.*

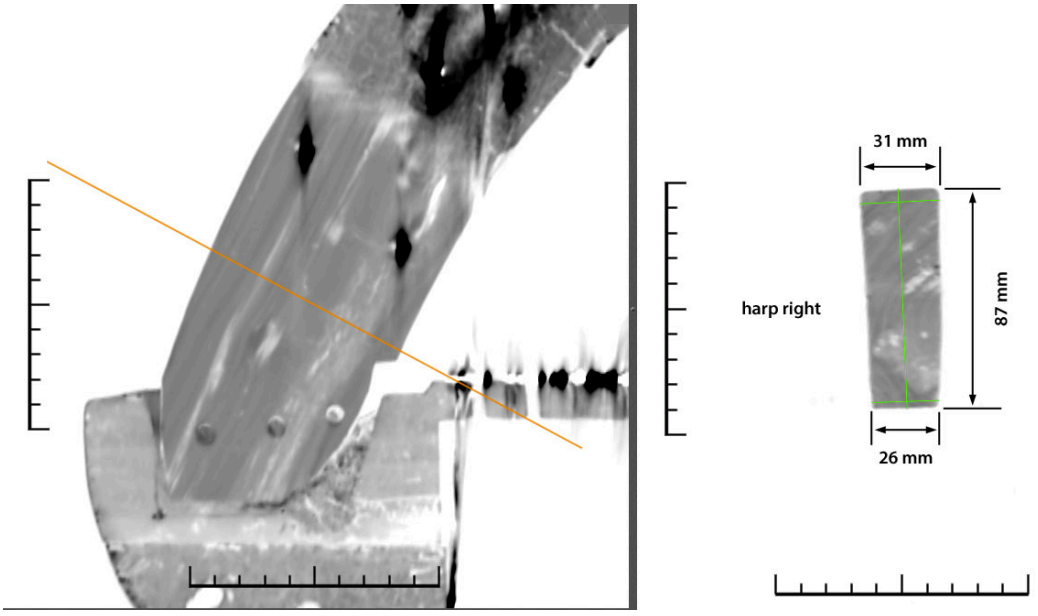


Figure 3.11: *Lamont forepillar cross-section D (see figure 3.7). This cross-section is on the lower 'replacement' section of the forepillar. Note that the tenon does not have a shoulder on its front end. Although not shown in this cross-section, the tenon shoulder is cut higher on the left-hand side of the forepillar versus the right-hand side to compensate for the forepillar leaning to the left. Scale 1 tick : 1 cm.*

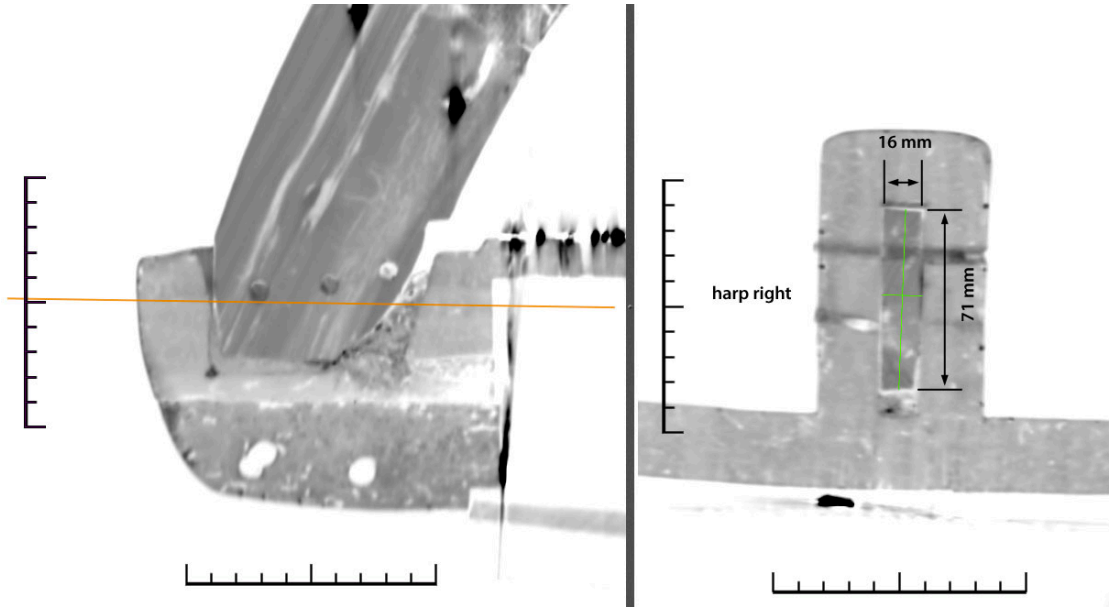


Figure 3.12: *Lamont forepillar cross-section E (see figure 3.7). This is the cross-section of the tenon in the soundbox joint. Scale 1 tick : 1 cm.*

Direction of wood grain

Prior to the commencement of this study it had been hypothesized that the wood grain follows the curve of the forepillar for Irish harps (in particular, the low-headed variety), although it had not been determined if this was actually the case for any of the surviving instruments.[232] Although some of the wood grain is visible in the cross-section shown in figure 3.7, the higher contrast tomogram in figure 3.13 shows it more clearly. It is evident from this tomogram that the direction of the grain in the upper section follows the curve of the forepillar, whereas the lower section appears to be straight grained.[233] It is not possible to tell from this cross-section whether the wood in the upper section was naturally curved (e.g. if it came from a curved branch) or had been bent.[234] Either way, the forepillar is stronger and more flexible with the grain following the curve than it would be if cut from a straight grained timber.

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[232] See e.g., Simon Chadwick, "A Historical reproduction of the Queen Mary Harp," *Newsletter of the American Musical Instrument Society* 36, no. 2 (Summer 2007): 16. Paul Dooley has determined that the forepillar of the Trinity College harp was probably made from a curved branch. Paul Dooley, "Medieval Irish Harp," 112.
[233] Loomis et al., "Lamont and Queen Mary Harps," 120 – 21.
[234] One could tell by looking at both sides of the centre of the timber for evidence of reaction wood in the form of non-concentric growth rings.

Dooley (2014) has argued that the in-built flexibility of a forepillar made from a curved grain timber may play an important role in the acoustics of the instrument by counteracting string stiffness in the bass.[235]

Figure 3.13: *high contrast tomographic cross-section of the Lamont harp forepillar showing the wood grain pattern. The direction of the grain in the upper piece follows the curve of the forepillar, whereas the lower piece appears to be straight grained. The joint with the neck is located at upper-right and the joint with the soundbox is located at lower-left in this figure. Scale 1 tick : 1 cm.*

[235] Paul Dooley, "Medieval Irish Harp," 111 – 12.

Decorative work

Although there is little in terms of decorative work on the Lamont harp forepillar, the ends of the t-section are carved in a decorative point. Figure 3.14 shows the upper termination of the t-section as viewed from the front and side.

Figure 3.14: *upper termination of the Lamont harp forepillar t-section, as viewed from the front (left) and side (right). Scale 1 tick : 1 cm.*

The center of the front face of the t-section is decorated with two concentric circles.[236] This is shown in the photograph in figure 3.15. This may have been intended for a painted badge, in the manner of the shield on the forepillar of a similar harp depicted in the painting of William Archdeacon, either not realized, or later removed.[237]

[236] This is also discussed in Armstrong, *Irish and Highland Harps*, 166.
[237] "An Irish harper on the continent ca. 1750," Irish Traditional Music Archive, accessed 18 May, 2014, http://www.itma.ie/digitallibrary/image/Irish–harper.

Figure 3.15: *concentric circles on the front face of the Lamont harp t-section. They are located at the centre of the t-section and may have been intended for a painted badge.*

Neck

The structural damage and repair to the neck and the neck/soundbox joint were discussed in detail in Loomis (2010), and the construction of the neck joint at the soundbox and the effect of the string tension on the neck position and orientation were discussed in Part I of this dissertation.[238] This section addresses other details of the neck construction. This includes the tuning pins, cheekbands, end cap, and some aspects of the repair work. Measured cross-sections of the neck are also presented. Additionally, the metal fittings and repair work are discussed in the context of the working history and dating of this harp.

[238] Loomis, "Structural Breaks and Repairs," 28 – 41.

Figure 3.16: *the Lamont harp neck, viewed from the right and left-hand sides. Photographs: Maripat Goodwin.*

Tuning pins

This discussion of the neck begins with the tuning pins. The Lamont harp currently has 30 out of a full complement of 32. With the exception of three that are iron, they are copper alloy with square drive heads incised with decorative work. This can be

seen in the examples shown in figure 3.17. Note that one of the pins in figure 3.17 does not match the others, and appears to have come from a different set.

Figure 3.17: *Lamont harp tuning pins: side view (top photo), and end view (bottom photo). The tuning pins on this harp are of the characteristic square-headed design with decorated drive head typical of Irish harp tuning pins. Note that the second pin from the right does not match the others. Photographs: Maripat Goodwin.*

In addition to the one shown in figure 3.17, the Lamont harp has a number of other mismatched tuning pins. In fact, there are at least six distinct designs represented. An attempt has been made here to group these by type in order to ascertain which is the primary (and possibly 'original') group, and which pins are likely to be replacements. The largest group, referred to here as 'group A', is shown in figure 3.18.

Figure 3.18 (overleaf): *Lamont harp tuning pins 'Group A'. The drive heads all have nearly the same profile and decorative work, although there is some variability in the incised lines. Each drive head is shown from the side, with a corresponding photo of the end of the drive head and the string end of the shaft. The numbers below each pin represent its current position in the harmonic curve, counting from the treble end. Note that some of the shafts have hash marks on the string end, while others do not. Photographs: Maripat Goodwin; montage assembled by the author.*

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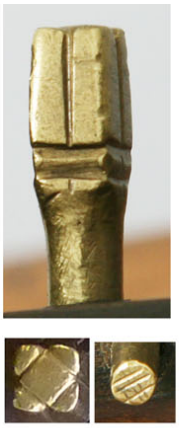

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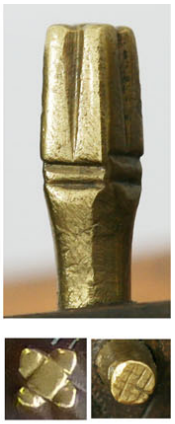

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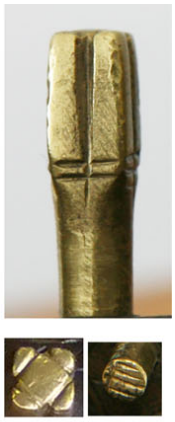

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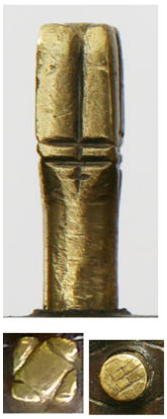

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Group A

The drive heads of these pins all have the same profile and could have been cast in the same mould or set of moulds. It is therefore possible that they comprise a 'matched' set. The decoration on the drive heads is in the form of a v-shaped groove incised down the centre of each side, terminating in two or three parallel lines just above the transition to the shaft, and a diamond incised on the end of the drive head. Although the pins appear to have been cast, tool marks visible under microscopic examination indicate that the decorative work was added by hand. This is also evident in the variability in execution amongst the pins. Most, but not all, of the winding ends of the pins are incised with hash marks. In some cases, the hash marks could have worn away. The end of tuning pin #16 does not look worn, though. This pin also has a slightly more tapered drive head than the others in Group A, so perhaps it does not belong to this set.

There are several tuning pins on this harp that appear to be just slightly different from the predominant group (Group A), and in some cases from each other. These have been placed together in 'Group B', shown in figure 3.19. Although these tuning pins have the same decorative design as those in Group A, the shape of the drive heads and the execution of the decorative work are slightly different. It is difficult to tell if these tuning pins belong to the set represented in Group A, or if they came from a different source.

Figure 3.19: *Lamont harp tuning pins 'Group B'. These tuning pins have the same design as those in Group A, but are slightly different in shape of the drive head and in execution of the decorative work. Each drive head is shown from the side, with a corresponding photo of the end of the drive head and the string end of the shaft. The numbers below each pin represent its current position in the harmonic curve, counting from the treble end. Photographs: Maripat Goodwin; montage assembled by the author.*

The remaining tuning pins are more clearly different from those in either Group A or Group B. Three of these are alike and appear to have come from the same source. They are grouped together in 'Group C', shown in figure 3.20. Although they follow the same broad design scheme of the other tuning pins, the v-shaped groove down

the sides of the drive head is much deeper and extends onto the shaft. There are also no lines incised across the faces of the drive head, and no hash marks on the string end of the shaft. As with the other tuning pins, the end of the drive head is incised with a diamond, however here the diamond is inscribed with a cross.

Figure 3.20: *Lamont harp tuning pins 'Group C'. This group of three tuning pins is distinctly different in design to any of the pins in either Group A or Group B. Each drive head is shown from the side, with a corresponding photo of the end of the drive head and the string end of the shaft. The numbers below each pin represent its current position in the harmonic curve, counting from the treble end. Photographs: Maripat Goodwin; montage assembled by the author.*

The remaining four copper-alloy tuning pins are shown in figure 3.21, below. These pins do not match any of the others, so are categorized separately as type 'D', 'E', 'F', and 'G'. One possible exception is tuning pin #10 (named 'Type D' here), which resembles the pins in Groups 'A' and 'B', however its drive head appears to have been filed, possibly to make it fit a tuning key, which suggests it may not belong with those pins. The other three tuning pins (types 'E', 'F', and 'G') are unlike any of the others, and are probably replacements. Compared to the pins in Group A, pin #12 ('Type E') has a more prominent, almost tulip shaped, drive head, and pin #29 ('Type F') has incised lines along the edges of each face of the drive head instead of down the centre, and lacks the diamond on the end. Pin #30 ('Type G') has an X incised on

each face of the drive head, just above the shaft, has a more abrupt transition from the head to the shaft, and has the diamond motif slightly recessed on the end of the drive head, creating projecting points at the corners.

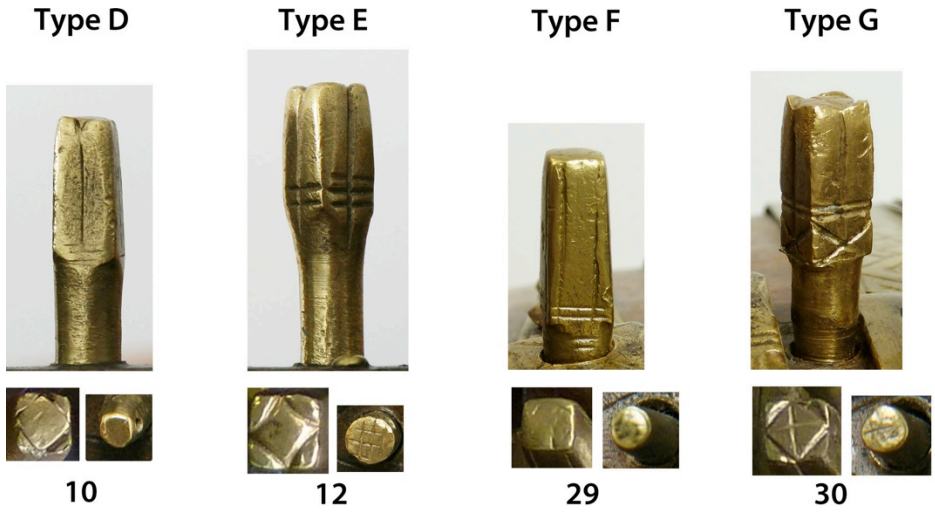

Figure 3.21: *Lamont harp tuning pins not matching any of the others on the harp. These pins are designated type 'D', 'E', 'F', and 'G'. Tuning pin #10 (type 'D') could possibly be categorized with Group B, however. Each drive head is shown from the side, with a corresponding photo of the end of the drive head and the string end of the shaft. The numbers below each pin represent its current position in the harmonic curve, counting from the treble end. Photographs: Maripat Goodwin; montage assembled by the author.*

The three iron tuning pins are shown in figure 3.22. They have undecorated drive heads of square cross-section. All three tuning pins have string holes, in contrast to the former iron tuning pins on the Queen Mary harp that had cleft string ends.[239] None have hash marks on the string end of the shaft.

[239] See the discussion of the Queen Mary harp tuning pins in Chapter 4.

Figure 3.22: *iron tuning pins on the Lamont harp. The drive heads are square in cross-section, undecorated, and have minimal signs of wear. The string ends of the tuning pins are also plain, and are pierced for a string. Each drive head is shown from the side, with a corresponding photo of the end of the drive head and the string end of the shaft. The numbers below each pin represent its current position in the harmonic curve, counting from the treble end. Photographs: Maripat Goodwin and Karen Loomis; montage assembled by the author.*

Composition:

Figure 3.23 shows a pin from Group C (# 22) next to one from Group A (#11), for comparison. In addition to the differences in decorative work on the drive head, the tuning pin from Group C is longer, with a total length of 95 mm versus 90 mm for the tuning pin from Group A. The colour of the alloy is also noticeably different for each of these two pins, indicating that they don't have the same composition. Four tuning pins, two from Group A and two from Group C, were analysed with XRF to determine their composition. The results of this analysis are shown in table 3.1.

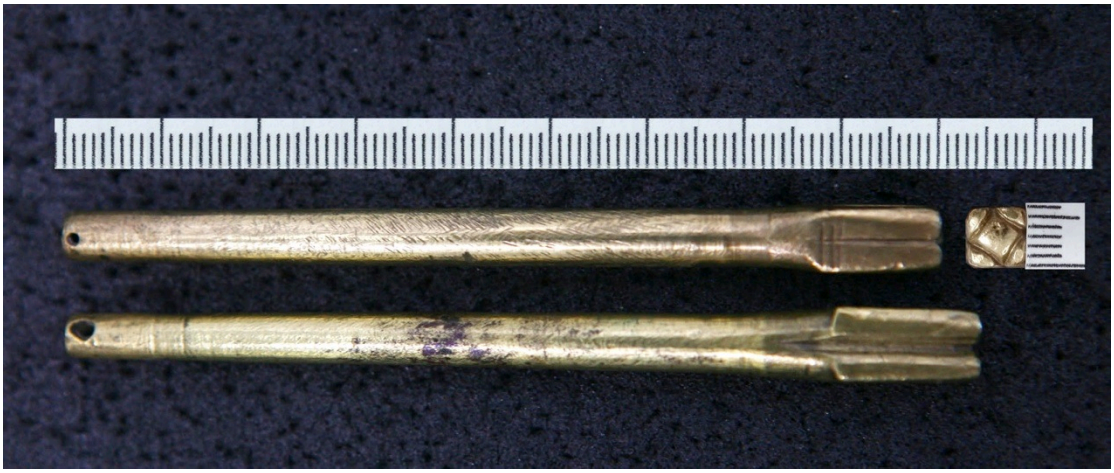

Figure 3.23: *two different Lamont harp tuning pins. Pin #11 (top) from Group A, and pin #22 (bottom) from Group C. In addition to the differing designs of the drive heads, the lengths, and the colour of the alloy are also different. The scale is 1 tick : 1 mm.*

Table 3.1.
Composition of four Lamont harp tuning pins[240]

Group	Pin #	Fe	Ni	Cu	Zn	As	Pb	Ag	Sn	Sb
A	2	0.4	0.3	84.2	10.3	0.8	1.0	0.1	2.9	0.0
A	11	0.4	0.3	81.7	13.6	0.4	0.7	0.1	2.8	0.0
C	3	0.1	0.3	79.7	17.1	0.1	1.0	0.0	1.6	0.0
C	22	0.1	0.4	76.0	20.5	0.3	1.1	0.0	1.5	0.0

Note: surface composition from semi-quantitative XRF analysis. Values are wt% for each element. The maximum measurement uncertainty is +/- 0.2%.

The analysis shows that the composition of the pairs of tuning pins within the same group is very similar, but the composition of the two groups is quite different. Given that the design of the pins is also different, we can conclude that they came from two distinct sources.

[240] Jim Tate and Susanna Kirk, "Analytical Research Section Report No. AR 2010/39: XRF analysis of the Queen Mary and Lamont harps," Internal Report. National Museums Scotland, 12 July, 2010.

The compositional analysis contains other important information. As discussed in the section of this dissertation on the wire fragments discovered in the two harps, some compositions of brass were more common than others within a particular time period. While it is not possible to definitively establish a date of manufacture from this information due to the variability in composition of historical brass, we can at least know when similar brass was most likely to be in use, and may be able to narrow down possible dates for these tuning pins.

From the early medieval period, brass was being produced on a large scale in towns in the area of modern day Belgium, using copper sourced from the Harz, with Dinant as an important centre for metalworking.[241] Exports of brass from Dinant and other Flemish metalworking towns to England via Antwerp were well established by the 12th century.[242] In 1466, when Dinant was sacked by the Duke of Burgundy, brass production was effectively shut down.[243] It was later reestablished elsewhere, notably in Nuremburg, which rose to prominence in the brass industry with the Fugger family, who established their business in Nuremburg in 1486.[244] Mitchiner et al. (1987) note that the shift in brass production towards Nuremburg that occurred in the late 15th century resulted in a change in the composition of the alloy, as observed in jetons from this time period.[245] Prior to the 1480's, the alloy generally used for jetons was a low zinc brass with a significant percentage of tin. Typically, the composition was 80 – 90% copper, 4 – 12% zinc, and 3 – 5% tin.[246] As discussed in Chapter 1 of this dissertation, the proportion of silver as a trace element also changed at this time. The Fugger family, notably, had acquired a monopoly on copper from mines in present day Austria and Hungary, and a drop in the amount of silver is seen in jetons produced after the mid 1480's, as the predominant source of copper shifted from the silver bearing ore from the Harz to non-silver bearing ore from mines in present day

[241] Colum Hourihane, ed., *Grove Encyclopedia of Medieval Art and Architecture*, vol. 2 (New York: Oxford University Press, 2012), 292.
[242] ibid.
[243] Mitchiner et al., "Nuremberg and its Jetons," 114 – 15.
[244] ibid.
[245] ibid.
[246] ibid. 115.

Austria and Hungary.[247] Although de-silverization of copper had been practiced since Roman times, the process was incomplete, and brass produced from silver bearing ore in the 15th century typically contained 0.1% or more of residual silver.[248] Of the brass jetons analysed by Mitchiner et al., most of those produced after the mid-1480's contain less than 0.1% silver, and many contain no measurable amount of silver.[249] As also discussed for the wire fragments, the proportion of nickel as a trace element may also be significant, as from circa 1200 – 1450, the primary source of copper for brass production in Europe was the non-nickel bearing ore from the Falun mine in Sweden.[250] Brass produced from this copper typically had less than 0.05% nickel, whereas brass produced from the nickel bearing ores in the Harz and in Austria and Hungary after circa 1450, typically had 0.1% – 0.5% nickel.[251]

As will be shown in the discussion below, the composition of the tuning pins, particularly the levels of trace elements, falls within expected ranges for historical brass from the period relevant to these harps. The exception, however, is arsenic, which is not typically present in brass produced from the 15th century onwards, but was detected in the analysis of the tuning pins.[252] It is notable that arsenic was detected on all of the metal parts of the Lamont harp that were tested with XRF, at levels ranging from 0.1 to 1.1%. It was not detected in the wire fragment, which was analysed with SEM-EDX. In addition to the different equipment used for the analysis, a polished cross-section of the interior of the wire was analysed, not the surface. It was also located within the harp, where it was not exposed to any surface treatments, such as paints, lacquer, or cleaning agents. If possible, a task for future analysis might be to rerun the analysis of the tuning pins on a small cleaned and polished surface to determine if there is surface contamination.

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[247] ibid., 114, 124 – 25.
[248] ibid., 124 – 25, 131.
[249] ibid., 131 ff.
[250] Pollard and Heron, "Brass Industry in Europe," 210 – 14, and Mitchiner et al., "Nuremberg and its Jetons," 126 – 27.
[251] Mitchiner et al., "Nuremberg and its Jetons," 126 – 27, and Pollard and Heron, "Brass Industry in Europe," 210 – 13.
[252] Mitchiner et al., "Nuremberg and its Jetons," 128 – 29. Brass made from Cornish and Welsh copper in the 17th and 18th centuries did typically contain appreciable arsenic, however.

Table 3.2 summarizes the typical historical brass compositions discussed above and compares them to the observed compositions of the Lamont harp tuning pins. Note, however, that **the historical compositions listed here are generalizations only**. While they are typical of the time period (as represented by the composition of jetons), not all brass artefacts contemporary with these dates fall within the listed ranges of composition.

Table 3.2.

Comparison of typical composition of brass jetons by time period to composition of Lamont harp tuning pins

Element	**Typical jeton composition wt%** [253]		**Lamont tuning pin composition wt%** [254]	
	ca. 1450 – 1480's	**ca. 1480's – 1650**	**A**	**C**
Cu	80 – 90	75 – 80	81.7 – 84.2	76.0 – 79.7
Zn	4 – 12	17 – 20	10.3 – 13.6	17.1 – 20.5
Sn	3 – 5	< 2	2.8 – 2.9	1.5 – 1.6
Pb	≤ 1	≤ 1	0.7 – 1.0	1.0 – 1.1
Ni	0.1 – 0.5	0.1 – 0.5	0.3	0.3 – 0.4
Ag	≥ 0.1	< 0.1	0.1	0.0
As	–	–	0.4 – 0.8	0.1 – 0.3

Note: the ranges of historical composition are generalizations only. The maximum measurement uncertainty for the tuning pins is +/– 0.2%

The composition of the analysed tuning pins from Group A closely corresponds to the typical composition of brass jetons produced from circa 1450 to the 1480's. This is true for the proportions of the trace elements as well as for copper and zinc. If the

[253] Summarized from Mitchiner et al., "Nuremberg and its Jetons," 114 – 15, 124 – 25, 131 – 40. Pollard and Heron, "Brass Industry in Europe," 210 – 14.
[254] The data for tuning pin composition is taken from table 3.1.

composition of the jetons is typical of brass from this time period, then the composition of the Lamont harp tuning pins from Group A is consistent with a date of manufacture within the time period of ca. 1450 – 1480's, from copper mined in the Harz.

Although the close correspondence of the data is compelling, it is not possible to come to any definite conclusions about the date of manufacture just from the chemical composition of the brass. For example, these tuning pins could have been made from an older object that was melted down. The analysis does show, however, that the composition of the alloy is not inconsistent with a 15th century date of manufacture for the tuning pins. Since Group A represents the primary set of matched tuning pins on this harp, they may be original to the construction of the instrument, so the analysis does support the possibility of a 15th century date for the construction of this harp.

By contrast, the composition of the analysed tuning pins from group C is consistent with the typical range of composition of brass jetons produced after the mid 1480's. In particular, the absence of detectable silver indicates that the copper was sourced from a non-silver bearing ore. As discussed above, non-silver bearing copper came from mines in the areas of present day Austria and Hungary, which became predominant sources of copper for brass making from the mid 1480's. Again, no definite conclusions about the date of manufacture can be drawn from the chemical composition of the brass. The close correspondence of the proportions of trace elements to the expected ranges within this period of time is compelling, however, and points to this set of three tuning pins being later replacements.

The replacement of at least three tuning pins at the same time means that at some point in its working life this harp was missing multiple tuning pins. This could be related to the damage to the neck. Some of the tuning pins in Group A are worn where the shafts have scraped against the cheekband. Ideally, this should not happen in normal use, and is an indication that these tuning pins were binding due to misalignment of the cheekbands. Under these conditions a tuning pin shaft can

quickly become significantly damaged and may become wedged in its hole. Due to the crack in the neck, the position of the left-side cheekband of the Lamont harp has shifted such that there is currently some misalignment with the right-side cheekband. It is possible that this resulted in damage to multiple tuning pins at the same time, necessitating their replacement. Another possible explanation is that the Lamont harp was unused for a period of time during its working life. If a harp is not maintained in tune, over time some of the strings are likely to break. Subsequently, the tuning pins belonging to those strings may be lost, either due to scavenging or simply because they are no longer tied to the instrument.

Comparison with other tuning pins:

Other surviving Irish harp tuning pins have decorative features in common with the brass tuning pins on the Lamont harp, and while there are differences in some of the details and in the workmanship, they can be seen to be variations on a common design scheme. Some examples are shown in figure 3.24.

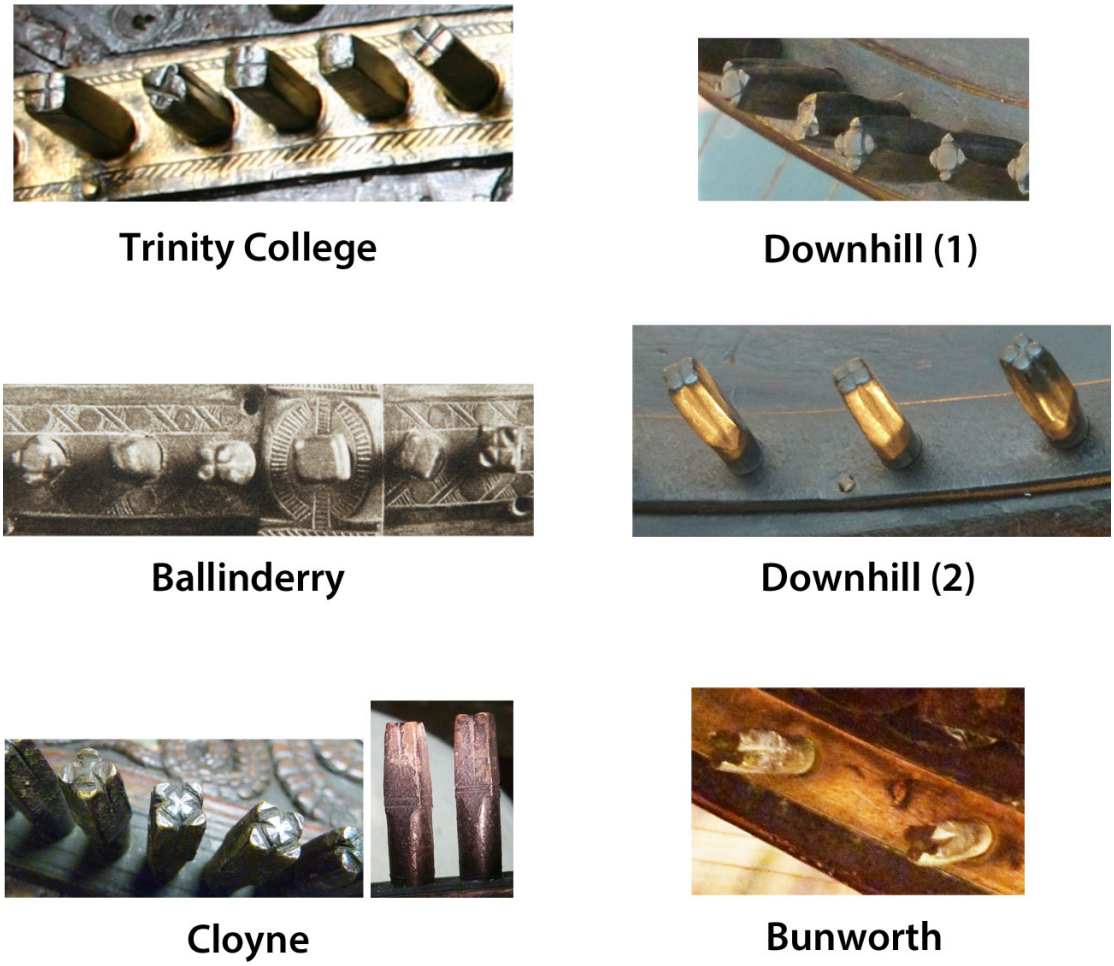

Figure 3.24: *some examples of Irish harp tuning pins typical of the square-headed design with decorated drive ends. Trinity College: ca. 15th century, Ballinderry: ca. 16th century, Cloyne: 1621, Downhill: 1702, and Bunworth: 1734.*[255] *The Downhill harp has tuning pins of two distinct designs: (1) in the treble and (2) in the bass. The Cloyne also has two distinct designs. The decorated copper alloy pins in the main rank (shown), and undecorated iron pins in the seven hole second rank (not shown).*

The tuning pins shown in figure 3.24 belong to the 'Trinity College', 'Ballinderry', 'Cloyne', 'Downhill', and 'Bunworth' harps. The common elements in their design are

[255] Trinity College harp photograph (detail): Paul Mullarkey, Trinity College, Dublin; Ballinderry harp metal fittings photograph (detail): Armstrong, *Irish and Highland Harps*, unnumbered plate opposite 62; all other photographs by the author. 'Trinity College' harp: Trinity College, Dublin; 'Ballinderry' harp fragments and 'Cloyne' harp fragments: National Museum of Ireland; 'Downhill' harp: Guinness Storehouse, Diageo Corp.; 'Bunworth' harp: Museum of Fine Arts, Boston. Images reproduced with the kind permission of The Board of Trinity College, Dublin; Guinness Storehouse Museum; and the National Museum of Ireland.

drive heads that are square in cross-section, with a v-shaped groove incised down the centre of each side, and a decorative design incised on the end consisting of either a diamond, a cross, or a diamond inscribed with a cross.

The characteristic features common to many Irish harp tuning pins make them easily identifiable, even when found separately from the instrument, as has been the case for a number of archeological finds.[256] One such find of particular note is a set of 24 tuning pins discovered in 1967 during excavations at Montgomery Castle in Powys, Wales.[257] This set of tuning pins, referred to henceforth as the 'Montgomery' tuning pins, was brought to the attention of the author in 2012 by Amanda Munday, owner of one of the pins. Munday's tuning pin is shown in figure 3.25, below.

[256] For a survey of archeological tuning pin finds, see Keith Sanger, "Harp Pegs Project (draft)," accessed 22 May, 2014, http://www.wirestrungharp.com/material/harp_pegs.html.
[257] Jeremy Knight, "Excavations at Montgomery Castle – Part II," *Archaeologia Cambrensis* 142 (1993): 202, 204. Graeme Lawson, "Excavations at Montgomery Castle – Part III. Appendix: Musical Instrument Remains from Montgomery Castle, Powys," *Archaeologia Cambrensis* 143 (1994): 197 – 98.

Figure 3.25: *one of a set of 24 matched tuning pins found at Montgomery Castle in Powys, Wales. Property of Amanda Munday; photographs used with permission.*

The remaining pins have been deposited at the Old Bell Museum in Montgomery, where they are on permanent display.[258] Several of these are shown in the photograph in figure 3.26.[259] They comprise a matched set of high quality craftsmanship, in apparently unused and nearly pristine condition. They are copper alloy with decorated drive heads of square cross-section, and appear to be cast, with the incised decorative work added by hand. The decorative motif on the sides of the drive heads consists of a deep v-shaped groove incised terminating at the beginning of the shaft where it is intersected by two sets of parallel lines incised at the midpoint and just above the transition to the shaft. The drive head has a quatrefoil cross-section,

[258] There are 21 tuning pins on display at the Old Bell museum. The author inquired as to the whereabouts of the remaining two tuning pins. A search made at the museum did not find them, so unfortunately two of the original set of 24 pins are currently missing.
[259] Permission to photograph the tuning pins in their display case was kindly granted to the author by John and Ann Welton, curators of the Old Bell Museum.

created by the grooves incised down each side. The end is decorated with a deeply incised cross-pattée with triangular arms.

Figure 3.26: *tuning pins found at Montgomery castle in Powys, Wales. The pins shown belong to a matched set of 24 in apparently unused condition. They are copper alloy with square drive heads decorated in a style characteristic of Irish harp tuning pins. Old Bell Museum, Montgomery. Photographs by the author; ©Powis Estate, from whom consent has been obtained for their use.*

During the excavations in 1967, the Montgomery tuning pins were found in the middle ward of the castle, above a cobble surface that was constructed between 1622 and 1625. They were therefore not deposited before 1622.[260] Montgomery castle was demolished in 1649, and because of the location of the find in the rubble in the inner ward, it was thought that they might have been deposited after the demolition of the castle.[261] Upon review of the archeological report, it has been suggested by Simon Chadwick that they could actually have been at the castle prior to the demolition, for example if they had been stored in one of the buildings in the inner ward and deposited in the rubble when these buildings were pulled down.[262] He has further suggested that, based on their apparent unused state, the resident of the castle during this time period might have commissioned a harp that was never completed. The set of pins would have consequently been left in storage, and possibly forgotten.[263] Since the site of Montgomery castle was not occupied after it was demolished, it is plausible that the pins pre-date the demolition.

Montgomery Castle's primary resident from 1622 to shortly before its demolition was Edward, Lord Herbert of Cherbury.[264] Edward Herbert was an Oxford educated philosopher, poet, statesman, and lutenist who is best known to scholars of early music for the "Cherbury" lute manuscript (a.k.a. the "Herbert" lute manuscript).[265] His association with the tuning pins is particularly plausible because in addition to his deep interest in music, Lord Herbert lived in Ireland from 1624 – 1628, where he was Lord Herbert of Castle Island. While in Ireland, it is likely he would have seen and heard professional Irish harpers playing for aristocratic patrons.[266] The case for his association with the tuning pins is further supported by a letter from him to

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[260] Jeremy Knight, "Excavations at Montgomery Castle – Part I," *Archaeologia Cambrensis* 141 (1992): 142.
[261] Knight "Excavations – Part II," 204.
[262] Simon Chadwick, personal communication, April, 2012. See Jeremy Knight, "Excavations – Part I", 142 – 43, for a diagram and discussion of the post–medieval layout of the buildings in the inner ward.
[263] Chadwick, personal communication, April, 2012.
[264] Knight "Excavations – Part I," 118 – 20.
[265] ibid., 118. See also Thurston Dart, "Lord Herbert of Cherbury's Lute-Book", *Music & Letters* 38 (1957): 136 – 48.
[266] Dart, "Cherbury's Lute-Book," 138.

Francis Lloyd, the manager of his estates in Ireland, written after Lord Herbert had returned from Ireland to live in Montgomery castle. In it he states,

> "[Your] Irish harper shall be welcome if he can play by the book after the English manner and speak good English."[267]
>
> 26 November, 1638

It is evident from his comment to Lloyd that Lord Herbert was interested in having an Irish harper come to Montgomery castle. He could have also been intending to have an instrument made for the harper. It would not have been unusual at the time for a patron to supply the harper with an instrument.[268] If the harp tuning pins found at Montgomery castle were associated with Lord Herbert, given his dates in Ireland and in Montgomery, and the interest expressed in his letter, a likely time frame for their manufacture would be 1624 – 1638, or shortly thereafter.

The decorative motif on the ends of the drive heads can be compared to the cross inscribed diamond motif found on other Irish harp tuning pins, including some of the tuning pins on the Lamont harp, and it is possible that these are two different versions of the same general motif. The motif on the ends of the Montgomery tuning pins closely resembles that on the ends of the tuning pins of the Cloyne harp (see figure 3.24, above), which is particularly interesting given that these two sets of pins may be contemporary with each other. They may represent a popular style of decorative motif for Irish harp tuning pins in that time period, or they may have come from the same workshop.

In comparing the two sets of tuning pins, the Cloyne motif appears to be a worn-down version of the Montgomery motif. Prior to the Montgomery tuning pins coming to light, the decorative work on Irish harp tuning pins was only known from the current worn state of the surviving pins, and it was not known how they would

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[267] W. J. Smith, ed., *Herbert Correspondence* (Cardiff: University of Wales Press, 1963), 99.
[268] For example, the Cloyne harp (1621) was commissioned by Sir John FitzGerald of Cloyne for his household musicians Giollapatrick and Dermot Mac Cridan. See O'Curry, *Manners*, 292.

have looked originally, or how much of the decorative work had worn away. The Montgomery tuning pins provide significant insight into this. If the motif on the end of the Cloyne tuning pins was originally like that on the Montgomery tuning pins, then the apparent amount of wear on them suggests that the Lamont harp tuning pins are likely to have as much if not more wear. This would be particularly true for the tuning pins in Group A, which could be over a century older than the Cloyne harp tuning pins. The diamond and the diamond inscribed with a cross are two common decorative motifs on the ends of Irish harp tuning pins. Some of the Lamont pins have the diamond motif, and others (those from Group C) have the diamond inscribed with a cross. Since we can assume that the ends of the tuning pins are worn, it is possible that the plain diamonds could have originally been inscribed with a cross that is now lost to wear, and that what appears to be two different motifs is actually one. At least one of the tuning pins from Group B (#24) has a diamond with a faintly inscribed cross that, with slightly more wear, would be entirely erased.

The decorative design on the Lamont harp tuning pins can be compared to the Cloyne and Montgomery tuning pins. If the diamond incised drive head of the Lamont harp tuning pins is turned 45°, the inscribed diamond takes on the appearance of the cross-pattée with triangular arms comparable to the more distinct cross-pattée on the Cloyne and Montgomery tuning pins. The deeply incised grooves down the sides also give it a quatrefoil cross-section, again comparable to those tuning pins. Notably, both of these motifs have been used as symbols of Christianity. The decorative motif on the drive heads has also been interpreted by Robert Evans as a 'clove' or 'rosebud' design.[269] A photograph of typical cloves is shown in figure 3.27. The shape of the clove, viewed end-on, can be compared to the decorative design on the ends of the tuning pins.

[269] Simon Chadwick and Robert Evans, "Lamont Harp Replica by Robert Evans," The Wire Branch of the Clarsach Society, last modified 15 January, 2002, http://web.archive.org/web/20020328104736/http://clarsach.net/BobsLamont.htm.

Interestingly, because of their shape, cloves have been used to represent the nails of the crucifixion from at least as early as the medieval era.[270] A possible interpretation of the motif on these tuning pins is that it was intended to have Christian symbolism. Overt Christian symbols are present on some of the other surviving Irish harps, for example the crosses in the decorative work on the forepillar and soundbox of the Queen Mary harp (discussed in Chapter 4 of this dissertation), an IHS monogram on the end cap of the Ballinderry harp fragments, and a probable IHC monogram on the neck of the Trinity College harp.[271] A specific, common symbolic intent for the decorative motif on the tuning pins could explain the appearance of this motif on tuning pins from different makers.

Figure 3.27: *the decorative design of the Lamont harp tuning pins has been compared to a clove, as shown in this photograph.*[272] *Historically, the clove has been used in Christian symbolism to represent the nails of the crucifixion. The shape of the clove as viewed end-on can be compared to the decorative work on the ends of the tuning pins.*

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[270] Margaret Freeman, *The Unicorn Tapestries* (New York: Metropolitan Museum of Art, 1983), 148.
[271] For a discussion of the IHS on the Ballinderry harp fragments, see Armstrong *Irish and Highland Harps*, 63 – 64, and plate opp. 62; for a discussion of the IHC on the Trinity College harp, see O'Curry, *Manners,* 276 – 77.
[272] As interpreted by Robert Evans. Simon Chadwick and Robert Evans, "Lamont Harp Replica by Robert Evans."

Cheekbands

Moving from the discussion of the tuning pins to the cheekbands, there are some interesting issues with regard to their decorative work, position on the neck, and composition that have not been previously discussed.

The discussion of the decorative work on the cheekbands of the Lamont harp actually begins with an entirely different historical artefact, a 14th – 15th-century arm reliquary from Co. Down in Northern Ireland known as the "Shrine of St. Patrick's Hand".[273] Arm reliquaries were used in Western Europe from the 12th to the 17th centuries, and like other reliquaries of this type, the Shrine of St. Patrick's hand is a hollow vessel shaped to resemble a forearm and hand, held upright. Based on details of the decorative work, this reliquary has been identified as insular Irish.[274] The base is enclosed by a decorated oval plate, and it is this plate that is of interest to the current discussion. The centre of the plate is decorated with an IHS monogram, or Christogram, denoting the name of Jesus Christ.[275] The IHS is surmounted by a cross, and there are four cross-pattées arranged on the rim of the plate. Although the details of the decorative work on the reliquary date it to the 14th – 15th centuries, according to Bourke (1987) the use of Roman rather than Lombardic or Gothic lettering dates the plate on the base to no earlier than the 16th century.[276] A photograph of the plate on the base of the reliquary is reproduced in figure 3.28.

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[273] Cormac Bourke, "The Shrine of St. Patrick's Hand," *Irish Arts Review* 4 (Autumn, 1987): 25. The Shrine of St. Patrick's Hand is on long term loan to the Ulster Museum from the Diocese of Down and Connor in Northern Ireland, and is on display at the Ulster Museum in Belfast, NI.
[274] Bourke, 26 – 27.
[275] Bourke, "St. Patrick's Hand," 27. According to Bourke, the plate may be a repurposed paten. Private communication, April 2012. The IHS denotes the first three letters of the Greek spelling of the name of Jesus. The letters I and H are the upper-case letters *iota*, and *eta*, with the S representing the final form of the Greek letter *sigma*.
[276] Bourke, "St. Patrick's Hand," 27.

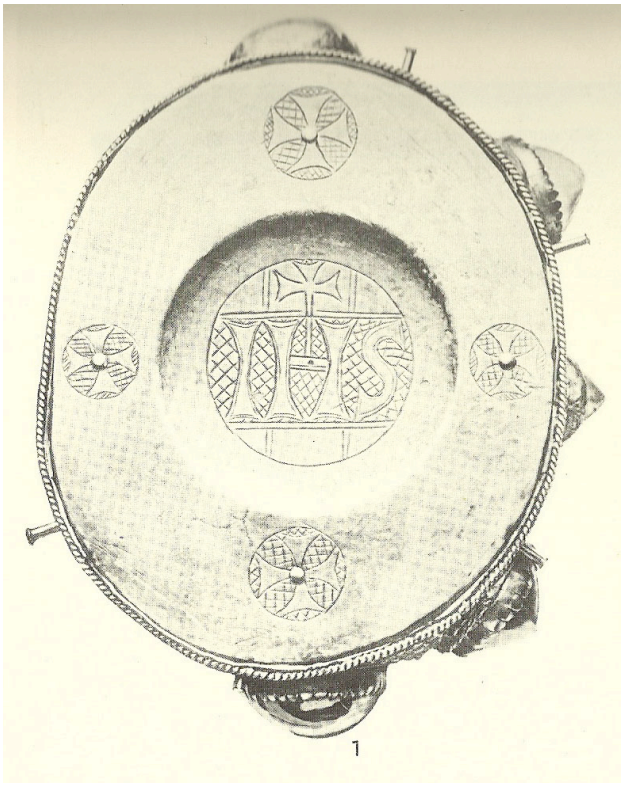

Figure 3.28: *decorated plate on the base of the reliquary shrine of St. Patrick's hand. The plate is inscribed with an IHS monogram surmounted by a cross, surrounded by four cross pattées.*[277]

In his description of the Lamont harp cheekbands, Armstrong (1904) notes, "Upon the right side at the treble end what appears to be S I I I is engraved."[278] This inscription is shown in the photograph in figure 3.29. At the time of Armstrong's publication, the meaning of the inscription was obscure, and has remained so since then.[279]

[277] Reproduced from Adolf Mahr, *Christian Art in Ancient Ireland* (Dublin: Stationary Office, 1941; reissued New York: Hacker Art Books, 1976), Plate 127.
[278] Armstrong, *Irish and Highland Harps*, 162.
[279] ibid., note 1.

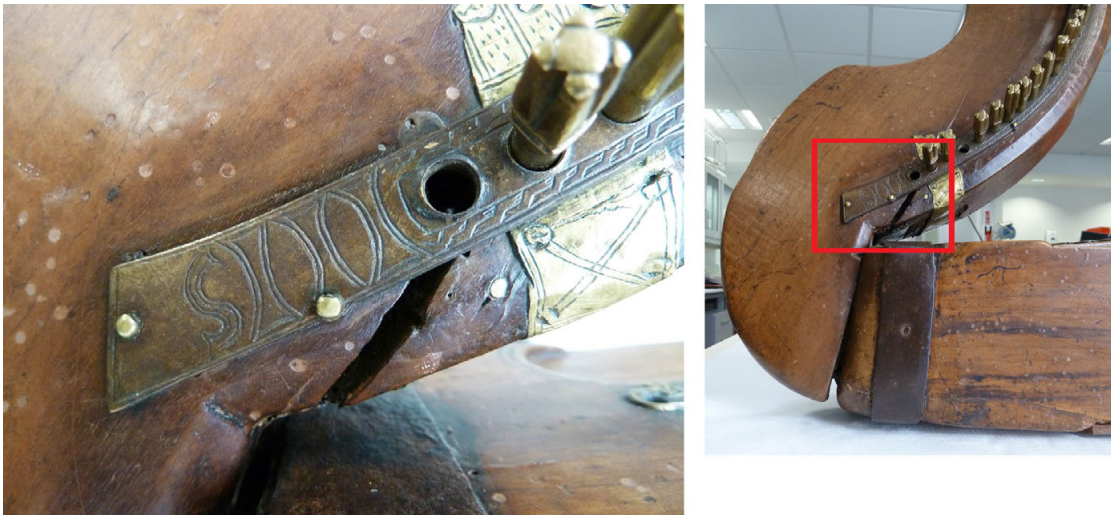

Figure 3.29: *inscription on the right hand cheekband of the Lamont harp. Its location is indicated by the red rectangle in the photograph on the right. This is the inscription referred to by Armstrong as "S I I I".*

Figure 3.30 juxtaposes the Lamont harp cheekband inscription with the St. Patrick's Hand reliquary inscription, but with the cheekband rotated so that it is upside-down (which is as it would appear viewed from above the neck of the harp).

Figure 3.30: *(left) the Lamont harp cheekband inscription, as viewed from above the neck, looking down; (right) the IHS inscription on the base of the St. Patrick's Hand reliquary.*[280] *Note the similarity of the two inscriptions.*

[280] Detail of photograph of St. Patrick's hand reliquary reproduced from Mahr, *Christian Art in Ancient Ireland*, Plate 127.

The resemblance of the two inscriptions is remarkable. Given the similarity, it is likely that the Lamont harp inscription is actually an IHS monogram, and may have been modeled after the inscription on this reliquary.[281]

In the 16th and 17th centuries, the IHS monogram was used as a symbol of the counter-Reformation, and was particularly associated with the Jesuits, who were active in Scotland in this time period.[282] The IHS monogram and other Christian symbols were used by some Catholics in Scotland in the post-Reformation period as an identifier and symbol of their faith, as documented by surviving examples found in houses in north-Eastern Scotland.[283] If the cheekband inscription on the Lamont harp is an IHS, then it is obscure, however. There is no crossbar on the H and the inscription is upside-down. It is possible that this was done as an attempt to conceal its meaning from iconoclasts. An early 17th-century example of an obscure IHS has been observed by Donnelly (2005) in Gortnetubbrid castle in Co. Limerick, Ireland.[284] According to Donnelly, "the monogram may have been deliberately carved in a cryptic style to prevent its detection by non-Catholic eyes."[285] The period from the late 16th century to the 18th century was a tumultuous and uncertain time with regard to religion in Scotland, so it seems reasonable that a recognizable symbol of the counter-Reformation would be intentionally rendered in an obscure fashion, in this instance hidden very effectively in plain sight.

The presence of this inscription on the cheekband raises some interesting questions. If it is an intentionally obscure IHS monogram, then it post-dates the Reformation in

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[281] The Lamont would not be the only Irish harp with a Christogram. As already noted, the end cap of the Ballinderry harp is engraved with an IHS, and the Trinity College harp neck is engraved with a probable IHC.
[282] Colm Donnelly, "The I.H.S. Monogram as a Symbol of Catholic Resistance in Seventeenth-Century Ireland," *International Journal of Historical Archeology* 9 (2005): 39. See also Ian Bryce and Alasdair Roberts, "Post-Reformation Catholic Houses of North-East Scotland," *Proceedings of the Society of Antiquaries of Scotland* 123 (1993): 369; and Thomas McCoog, *The Society of Jesus in Ireland, Scotland, and England 1541 – 1588* (New York: Brill, 1996), 178 ff.
[283] Bryce and Roberts (1993), 363 – 72. See also Ian Bryce and Alasdair Roberts, "Post-Reformation Catholic Symbolism: further and different examples," *Proceedings of the Society of Antiquaries of Scotland* 126 (1996): 899 – 909.
[284] Donnelly "I.H.S. Monogram," 40.
[285] ibid.

Scotland. Comparison of the placement and workmanship of the inscription to the decorative border that runs the length of the rest of the cheekband indicates that it is probably not a later addition. This suggests that the cheekband may date to no earlier than the late 16th century. If the cheekband is original, then this would also place a lower limit on the date of the neck, and possibly the rest of this harp. The cheekband may be a replacement, however. Note the placement of it with respect to the crack in the neck, as shown in the left-hand photograph in figure 3.29. A crack of that size opening up in the wood underneath the cheekband would cause it to pull away from the wood where it is nailed in at the end. If the cheekband is original to the neck, then it would have been repositioned when the crack opened up, otherwise it would be out of alignment with the tuning pin holes in the wood. Repositioning of the cheekband should be evident by the presence of a nail hole in the wood beyond the current location of its end. As discussed in the Chapter 2 of this dissertation, the left-hand cheekband does appear to have been repositioned, based on the evidence of nail fragments embedded in the wood. A similar examination of the right-hand cheekband has so far found no evidence of a nail hole, nail fragments, or residual corrosion in the expected location. This is illustrated in figure 3.31.

Figure 3.31: *close-up of the right-hand cheekband on the Lamont harp at the treble end. The arrow indicates where the nail would have been positioned before the crack opened up in the neck. There is no nail hole in this location. Note, however, that there is a linear impression visible in the wood just above the present location of the cheekband indicating the original position of its upper edge.*

If this cheekband was nailed to the neck in the same manner as it is currently, there should be a nail hole in the wood at the location indicated by the arrow in the photograph in figure 3.31. There is nothing in this location, however, and there is also no evidence on the tomograms that there ever was a nail in this location. Just above the upper edge of the cheekband, however, there is a linear impression in the wood that is in the correct position for it before the neck cracked. So, either this cheekband was repositioned without leaving evidence of having been nailed into the wood at the original location, or the impression in the wood is from a different cheekband, with nail holes hidden underneath the present cheekband. Examination of the tomograms shows a possible trace of corrosion from a nail, deeply embedded in the wood near the present location of the end of the cheekband. This is not associated

with the nail currently in the end of the cheekband. This could be evidence of an earlier cheekband, but as it is a small trace it is uncertain.

The possibility of the cheekband not being original raises the question as to why it would be replaced, however. If the original cheekband had been damaged, for example when the neck cracked, it might be easier to repair than to replace. It is possible, however, that the original cheekband was deemed inadequate to reinforce the neck against the pull of the strings (hence the crack in the neck). The current cheekbands are a fairly substantial 3.8 mm thick (compared to 0.75 mm for the Queen Mary harp cheekbands).

The composition of the cheekband is also of interest in this discussion. From semi-quantitative analysis with XRF, it was found to be bronze, with low levels of trace elements. The results of the analysis are shown below.

Table 3.3.

Composition of Lamont harp cheekband[286]

	Fe	**Ni**	**Cu**	**Zn**	**As**	**Pb**	**Ag**	**Sn**	**Sb**
Lamont harp right-hand cheekband	0.3	0.5	88.3	0.2	0.1	0.0	0.0	10.5	0.0

Note: surface composition from semi–quantitative XRF analysis. Values are wt% for each element. The maximum measurement uncertainty is +/– 0.2 %.

In contrast to the analysed tuning pins, which are brass, this cheekband is a bronze of 10% tin with very low levels of zinc and other trace elements. It contains trace nickel, and no measurable silver. While not definitive, the trace elements might favour a later (post late 15th-century) date of manufacture, which would be consistent with a post-Reformation, or late 16th-century, date. The left-hand cheekband, which is the

[286] Tate and Kirk, "XRF analysis of the Queen Mary and Lamont harps."

same as the right-hand cheekband in terms of its construction, but has somewhat different decorative work, has not yet been analysed. Based on the workmanship, it is probable that both cheekbands were made at the same time, however a comparison of the alloy composition would verify if this is the case.

The remainder of the decoration on the right-hand cheekband consists of an incised border with a fret, or 'key', motif, as shown in figure 3.32, below. Small, incised marks add to the contour of the design, although this extra detail is missing on most of the upper border.

Figure 3.32: *decorative border on the right-hand cheekband of the Lamont harp. The border is incised in a fret, or 'key', motif. Note the small detailing added to give the pattern some contour. The section of the cheekband shown is the treble end, at the first and second tuning pin holes.*

By comparison, the decorative work on the left-hand cheekband is slightly less refined, as shown in figure 3.33. In place of the fret-patterned border, this cheekband has a plain border and a repeating motif that can be seen either as mirroring the "I" in the inscription on the right-hand cheekband, or as resembling "eyes", with the tuning pin ends as the pupils. Whether this is intended to be an oculus pattern is unknown.

The pattern also mirrors (or is mirrored by) the shape of the boss on the end cap. In place of the inscription at the treble end of the right-hand cheekband, the pattern on the left-hand cheekband continues past the first tuning pin hole, as shown in figure 3.34, finishing somewhat raggedly at the end.

It is possible that less attention was paid to the execution of the decorative work on the left-hand cheekband due to this being the side of the harp more likely to face away from the audience when it is being played. As discussed later in this chapter, the wear on the sides of the soundbox and on the foot of the harp indicate that the Lamont harp was held with the instrument leaning towards the left side of the player's body, with the left hand playing the treble strings, and the right hand the bass. Held in this manner, both the harp and the player present well if the player is turned slightly from forward with the right side of the body towards the audience (or towards the most important members of the audience). The right-hand side of the harp also shows off the decorative ends of the tuning pins, as opposed to the left side, which shows the winding ends. As discussed in Chapter 4, the Queen Mary harp (which was held and played in the same orientation) has marks from badges that formerly decorated the neck, and these are exclusively found on the right-hand side, consistent with this side being more visible to the audience.

Figure 3.33: *decorative work on the left-hand cheekband of the Lamont harp. The motif mirrors the "I" in the inscription on the right-hand cheekband, repeating in between each tuning pin. The section of the cheekband shown is at tuning pins #24 to #27.*

Figure 3.34: *the left-hand cheekband of the Lamont harp, at the treble end. The decorative motif continues somewhat raggedly past the first tuning pin, to the end.*

As discussed in Chapter 2 of this dissertation, examination of the tomograms indicates that the neck and cheekbands were not shortened. While it was not possible to remove the end cap for visual inspection, a small portion of the left-hand cheekband is visible under the end cap, at the hole for the 31st tuning pin, as shown in the photograph in figure 3.35. This hole is located near the end of the cheekband. There is an incised line on the cheekband next to the tuning pin hole. It is difficult to tell, because it is a short section, but the line that is visible appears to be straight, unlike the other incised decorative lines, which curve around the holes for the tuning pins. This straight line may delineate the end of the cheekband.

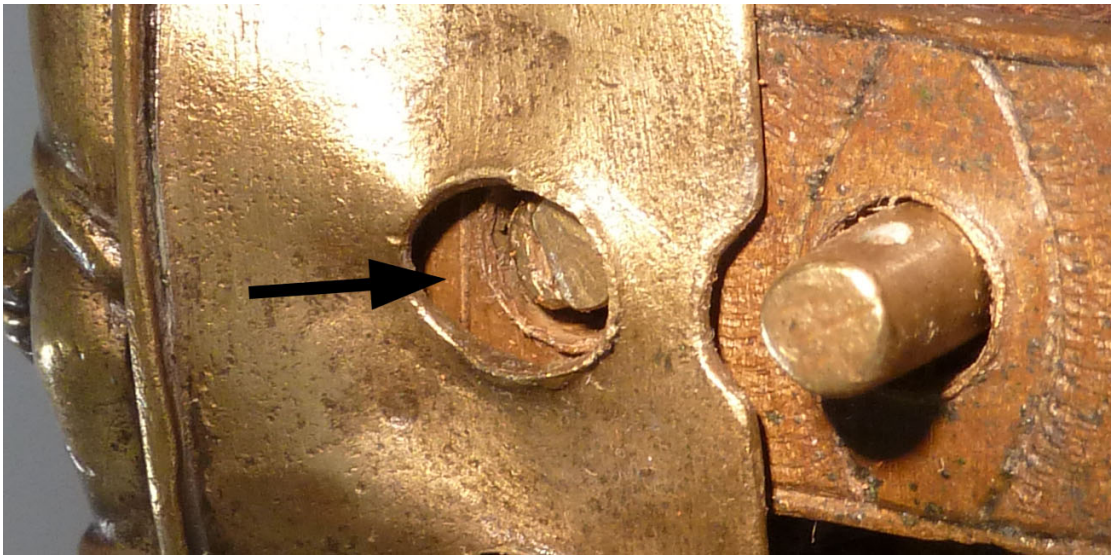


Figure 3.35: *a close-up view of a small area of the left-hand cheekband of the Lamont harp, visible under the end cap. Note that the incised line (arrowed) appears to be straight, in contrast to the lines in the repeating decorative pattern. This line may be additional evidence that the cheekband was not shortened.*

Dimensions:

The cheekband dimensions are given in table 3.4, below. They are the same for both, with the exception of the tuning pin holes, which are slightly larger on the right-hand cheekband, to accommodate the taper of the tuning pins. The shape of both cheekbands is nearly identical. Tomograms of each cheekband are shown in figures 3.36 and 3.37. Ideally, all of the tuning pins would have been removed prior to CT scanning in order to reduce metal interference and to allow the tuning pin holes to be imaged. Several of the tuning pins are firmly wedged in place in the neck, however, so it was not possible to remove all of them. Note that thick metal objects can result in saturation. **In areas where the voxels are saturated, the image of the edge of the cheekband extends up to 1 mm beyond the true edge**. This effect needs to be taken into consideration if using these figures for replicating the cheekbands or taking measurements.

Table 3.4.
Lamont harp cheekband dimensions

dimension	**measurement (mm)**
length	380
width	14 (flares to 17 at treble end)
thickness	4
tuning pin hole diameter	7 (right); 6 (left)

Note: the cheekband length is the straight-line distance from the midpoint of each end, including the part hidden under the end cap. The measurement uncertainty is +/- 1mm for the cheekband length, +/- 0.5mm for all other dimensions.

Figure 3.36 (overleaf): *tomographic image of the right-hand cheekband of the Lamont harp. The treble end of the cheekband is at lower left.* ***Note: in areas where the voxels are saturated, the image of the edge of the cheekband extends up to 1 mm beyond the true edge.*** *Scale 1 tick : 1 cm; grid scale 1 square : 1 cm.*

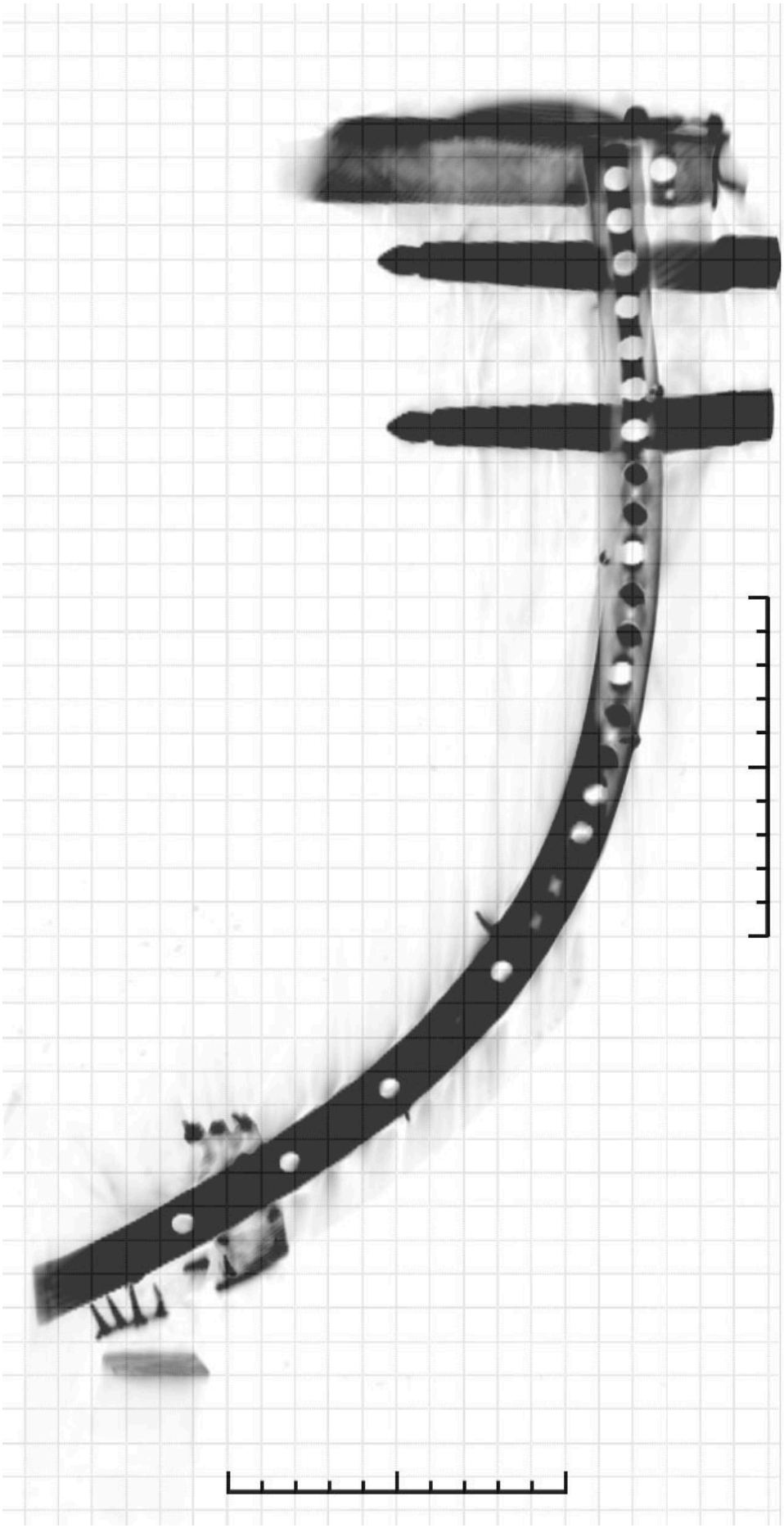
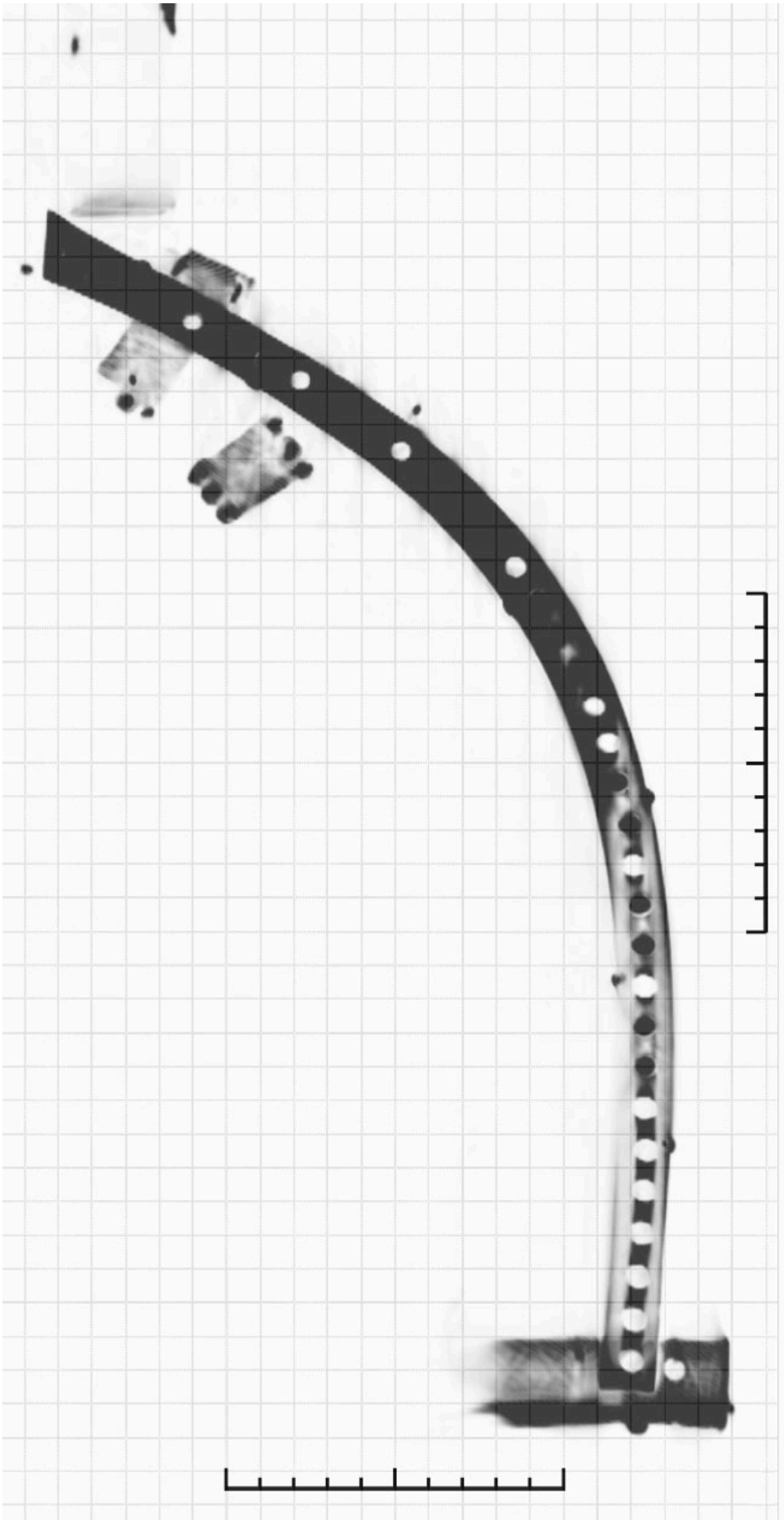


Figure 3.37 (overleaf): *tomographic image of the left-hand cheekband of the Lamont harp. The treble end of the cheekband is at upper left.* ***Note: in areas where the voxels are saturated, the image of the edge of the cheekband extends up to 1 mm beyond the true edge.*** *Scale 1 tick : 1 cm; grid scale 1 square : 1 cm.*



This examination of the cheekbands of the Lamont harp has provided some interesting insights, the foremost being the possibility that the inscription is a post-Reformation IHS monogram. It has also raised some questions that have yet to be answered. Were both cheekbands made at the same time? The nearly identical dimensions suggest that they were, but the composition of the alloy comprising the left-hand cheekband needs to be analysed to confirm this. Are these the original cheekbands for this neck? If they are, then are any of the tuning pins original? The alloy used for the right-hand cheekband is very different from any of the tuning pins that were analysed, although this does not necessarily rule out their being made at the same time. Why does the cheekband inscription so closely resemble the inscription on the base of a reliquary historically associated with Co. Down in present day Northern Ireland? Does the presence of this inscription mean the cheekbands post-date the Reformation?

End cap

In Chapter 2 of this dissertation, the end cap was discussed in terms of the part of the neck and cheekbands that is hidden underneath it, and the implications for ascertaining the original number of tuning pins in the neck. This discussion examines the end cap itself in terms of its construction and decorative work.[287] The Lamont harp is not unique in having a metal cap on the end of the neck. Amongst other surviving Irish harps, the Trinity College and Castle Otway also have end caps, and the Ballinderry harp fragments include a metal end cap.[288]

Figure 3.38 shows the Lamont harp end cap as it currently appears, viewed from the right-hand side, and from the front.

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[287] The end cap of the Lamont harp is discussed in Armstrong (1904). See Armstrong, *Irish and Highland Harps*, 163, Plate II, opp. 160, and Plate III, 5 opp. 162.
[288] For a photograph of the Trinity College harp end cap, see Dooley, "Medieval Irish Harp," 48; for an illustration and discussion, see Armstrong, *Irish and Highland Harps*, 58. For the Castle Otway and Ballinderry harp end caps, see Armstrong, *Irish and Highland Harps*, 63 – 64, and plates opp. 62; and 74, respectively.

Figure 3.38: *the metal end cap on the neck of the Lamont harp, side and front view. Photographs: Maripat Goodwin*

The Lamont harp end cap is constructed from three pieces: a faceplate, a sleeve, and a raised border around the edge of the faceplate.[289] It is attached to the neck from the side, with nails driven through the sleeve. There are currently two nails on the right-hand side, and three on the left, with a hole for a third nail on the right-hand side next to the #32 tuning pin hole. On the front of the end cap, there are three studs with decorated caps. These attach the raised border to the faceplate. They do not extend into the neck. Figures 3.39 – 3.41 show the end cap in more detail. In these photographs the separate pieces that comprise it can be more easily discerned.

[289] The author would like to acknowledge Daniel Tokar for initially discussing the pieced construction of the end cap. Daniel Tokar, e-mail message to author, 14 January, 2008.

Figure 3.39: *left-hand side view of the Lamont harp end cap. The cap is constructed from three pieces, sleeve, faceplate, and separate raised border. It is held onto the neck by nails driven through the sleeve, which is decorated with a geometrical interlace pattern. Photograph: Maripat Goodwin.*

Figure 3.40: *bottom end of the Lamont harp end cap. The interlace pattern on the sides of the sleeve is continued on the bottom end. It has been cut and bent upwards to accommodate the forepillar.*[290]

[290] See also Armstrong, *Irish and Highland Harps*, 163.

Figure 3.41: *front view of the Lamont harp end cap. The three decorated studs attach the raised border to the faceplate, which is decorated with a foliaceous pattern and a large gemstone-like repoussé.*

Figure 3.41 shows the end cap as viewed from the front. Note that the boss is tilted with respect to the vertical axis of the faceplate. This could be unintentional, however the direction of the tilt happens to be opposite the direction of the leftward lean of the neck and forepillar. This does have the effect of creating an illusion that they are more upright when the harp is viewed face on, as in the right-hand photograph in figure 3.38. The illusion would be more effective if the tilt of the neck and forepillar were less extreme. If this was done intentionally by the maker of the Lamont harp end cap, then it is a clever feature, and it would suggest that the end cap was added to the harp after the neck began to tilt over towards the left-hand side.

In his discussion of the Lamont harp end cap, Armstrong (1904) mentions that the raised border is bent upwards across the faceplate along the lower edge of the end cap, so that it is covering part of the incised decorative work on the faceplate. This is evident in his published photograph of it.[291] The raised border also appears to be slightly bent along the left side of the end cap in that photograph. In comparing Armstrong's photograph to the recent photograph in figure 3.41, it is evident that the raised border has been straightened since Armstrong's photograph was taken. A visible dark curved line across the lower end of the faceplate indicates where it was previously. This may have occurred when the harp underwent aggressive conservation work in the early 1980's. An undated archival photograph shows the end cap in the process of being cleaned, as reproduced in figure 3.42, below.

[291] Armstrong, *Irish and Highland Harps*, Plate II, opp. 160.

Figure 3.42: *undated archival photograph of the Lamont harp end cap (and cheekband) undergoing conservation. Note that the lower part of the raised border on the end cap is bent in this photograph. It has since been straightened. Photograph: National Museums Scotland archive H.LT2.*

This archival photograph probably relates to this relatively recent conservation work. In it, the raised border is still bent. Armstrong had observed that the metal parts of the harp were covered in brown paint.[292] He does note that most of this had apparently been removed from the end cap and neck straps, but that the string shoes, tuning pins and cheekbands were covered in a heavy layer of paint.[293] The conservation work shown in this photograph was likely undertaken to remove that paint. Other archival photographs apparently taken at the same time show the string shoes undergoing the same treatment.

With regard to the decorative work, the end cap is by far the most highly ornamented part of the Lamont harp. The faceplate is decorated with an incised foliaceous design surrounding a prominent repoussé boss that may have been

[292] Armstrong, *Irish and Highland Harps*, 167.
[293] ibid.

intended to resemble a large gemstone. The outline of the boss could also be interpreted as having the shape of a *mandorla*. This shape is mirrored in the motif on the left-hand cheekband.

The sleeve is decorated in an incised angular interlace pattern, although it is left undecorated where it crosses over the cheekband. The small section just below the cheekbands on each side is simply decorated with a rectangle inscribed with an X. The raised border takes the form of a rope moulding along its upper portion, and a fluted moulding along the portion of it below the cheekbands. The decorative pattern on the sleeve happens to be the same as that on the lower portion of the inside curve of the Queen Mary harp. These are shown together in figure 3.43.

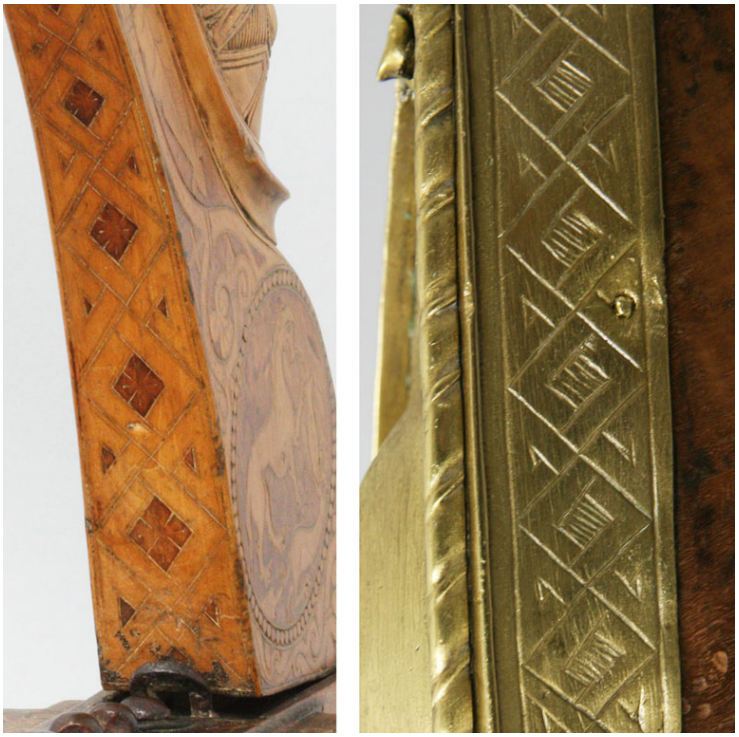

Figure 3.43: *angular interlace pattern on the inner curve of the Queen Mary harp forepillar (left), and the end cap of the Lamont harp (right). Note that the pattern is the same on both harps (although mirror reversed). The two photographs are not shown at the same scale. The pattern is 1.5x larger on the Queen Mary harp versus the Lamont harp. Photograph (right): Maripat Goodwin.*

As evident in figure 3.43, the interlace pattern is the same on both harps, except that it is mirror reversed. Because these two harps belonged to the same family, the presence of the same distinctive motif on both instruments is interesting. This could simply be a commonly used motif, and therefore it is only coincidental that it appears on both harps, but if the motif was copied from one harp to the other, for example from the Queen Mary to the Lamont harp, it could place a lower limit on the date of the end cap. According to the provenance of these harps as recounted by Gunn (1807), the two harps were not together before the late 16th century.[294] The end cap would, therefore, not date to earlier than that. This does not necessarily constrain the date of the neck, because it is possible that the end cap is not original to its construction.

The end cap was analysed with XRF, and found to be a brass alloy of similar composition to the analysed tuning pins from Group A. The results of the analysis are shown in table 3.5, below, with the results for the tuning pins from Group A included for comparison.

Table 3.5.

Comparison of composition of Lamont harp end cap and tuning pins from Group A

Location	Fe	Ni	Cu	Zn	As	Pb	Ag	Sn	Sb
end cap faceplate	0.6	0.3	79.6	14.8	0.5	1.2	0.1	3.0	0.0
end cap boss	0.5	0.3	79.8	14.9	0.4	1.0	0.1	2.9	0.0
end cap boss crease	0.5	0.2	80.1	14.3	1.1	0.8	0.1	2.8	0.0
tuning pin #2	0.4	0.3	84.2	10.3	0.8	1.0	0.1	2.9	0.0
tuning pin #11	0.4	0.3	81.7	13.6	0.4	0.7	0.1	2.8	0.0

Note: surface composition from semi–quantitative XRF analysis. Values are wt% for each element. The maximum measurement uncertainty is +/– 0.2%.

[294] Gunn, *Historical Inquiry*, 1, 13.

The difference in measured composition between the end cap and tuning pin #11 is smaller than the difference between the two tuning pins. This close similarity in the composition suggests the possibility that they could have been made together. If the end cap were to date to the late 16th century, then so would the tuning pins belonging to this group, regardless of the earlier date suggested by their composition. This would imply that either the neck was constructed at this time with the end cap and these tuning pins, or the end cap and tuning pins in Group A were later additions. This is speculative, however, as there isn't enough information to draw any conclusions. The pair of straps across the neck/forepillar joint could provide a clue. They are very likely not original to the construction of the neck. If their composition matches the end cap and the Group A tuning pins, they could have all been made at the same time, which would imply that the end cap and Group A tuning pins are later additions. Due to the geometry of the harp frame, it was not possible to obtain XRF analysis of these straps for this study, however. This analysis may be obtainable with hand-held XRF, as part of further research. These straps are discussed in terms of their decorative work in the following section.

Neck – forepillar straps

The pair of reinforcing straps fastened across the neck/forepillar joint are shown in figure 3.44, below.[295] In the section of Chapter 2 on the stringing of the Lamont harp, it was established that these straps were added to the harp after the string tension had shifted the forepillar in the neck joint. Additionally, it was established in the discussion of the forepillar that the straps were added after the tenon on its upper section was recut and reseated in the neck joint.[296] It is therefore evident that these straps are not original to either the neck or the forepillar. Evidence for similar straps on other Irish harps was discussed in the context of the possibility that they may represent a reinforcement added to these instruments in response to increased string tension.

[295] These straps are also discussed in Armstrong, *Irish and Highland Harps*, 163 – 64.
[296] This is also discussed in Loomis et al., "Lamont and Queen Mary Harps," 120.

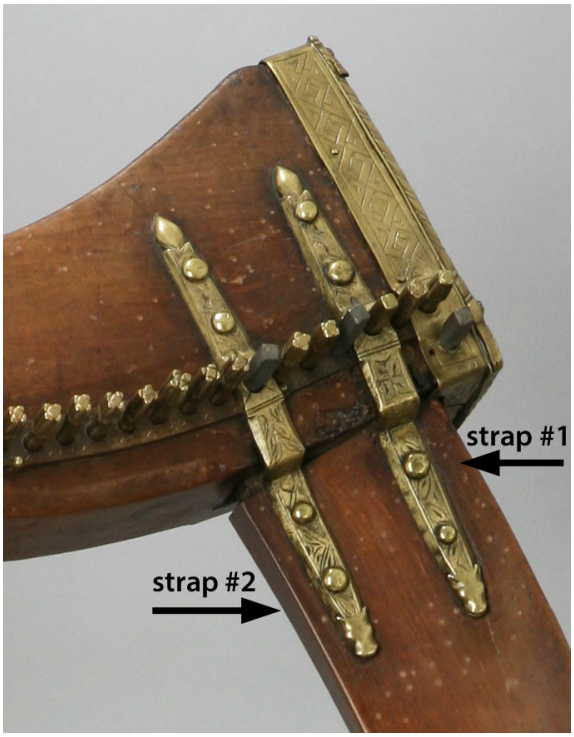

Figure 3.44: *the reinforcing straps across the neck/forepillar joint of the Lamont harp (arrowed). These straps were added after the string tension had caused the forepillar to shift in the joint. They are cast, and decorated with incised lines. Photograph: Maripat Goodwin.*

The straps are cast, and both terminate in an animal head at the lower end. Armstrong (1904) describes the shape of the heads as "dragonesque."[297] Guy Flockhart has suggested, alternatively, that the straps were made to resemble foxes, with the shape of the upper termination representing the bushy tail.[298] Both straps are decorated with incised lines in the same motif, although the execution is not identical. Figures 3.45 and 3.46 show the decorative work in detail for each. The upper section is incised with a two strand twist interlace pattern, and the lower section with a foliaceous design. Although the pattern is broadly the same on both (they are mirror reversed to one another), it is rendered in more detail on the strap further from the end of the neck (strap #2 in figure 3.44). The foliaceous design on the small section below the cheekband is also different on each strap. Figure 3.47 shows the animal heads on the end of each strap in detail.

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[297] Armstrong, *Irish and Highland Harps*, 164.
[298] As related to the author by Robert Evans, personal communication, December, 2010.

Figure 3.45: *decorative details on Lamont harp strap #1 (see figure 3.44). The end of the neck is towards the top of this figure. The upper section (top) is incised with a two strand interlace, and the lower section (bottom) is incised with a foliaceous pattern.*

Figure 3.46: *decorative details on Lamont harp strap #2 (see figure 3.44). The end of the neck is towards the top of this figure. The upper section (top) is incised with a two strand interlace, and the lower section (bottom) is incised with a foliaceous pattern. Note that the decorative pattern is slightly different to that on strap #1.*

Figure 3.47: *photographs of the animal head on the end of each strap, enlarged to show detail: strap #2 (left), strap #1 (right).*

Each strap is secured to the neck by three rivets (one through the neck, and two through the forepillar), and a long nail in the neck. The ends of the rivets can be seen in the photograph shown in figure 3.48. All except one of these are secured with crude washers (one of which appears to be copper).[299] One rivet is secured with a decorative stud instead of a washer. It is possible that this is original, and that the washers are replacements. This stud has ridged edges similar to the studs on the faceplate of the end cap, so they could have been made together.

[299] One rivet has had its end broken off and has lost its washer. The hole has subsequently been filled with putty, but the depression left by the washer is still visible.

Figure 3.48: *view of the left-hand side of the neck and upper forepillar, showing the ends of the rivets that secure the straps reinforcing the neck/forepillar joint.*

Figure 3.49 shows a set of snapshots from a video of a tomographic rendering of the CT scan of the end of the neck. These snapshots show the locations of the rivets and nails in the wood. The rivets are visible extending through the neck and forepillar, and the two long nails can be seen to extend into the wood to the centre of the neck. Note that the end of the top rivet for strap #1 appears to be split. This is the rivet that has a stud instead of a washer. This rendering also reveals a nail hidden underneath the animal head on strap #1.

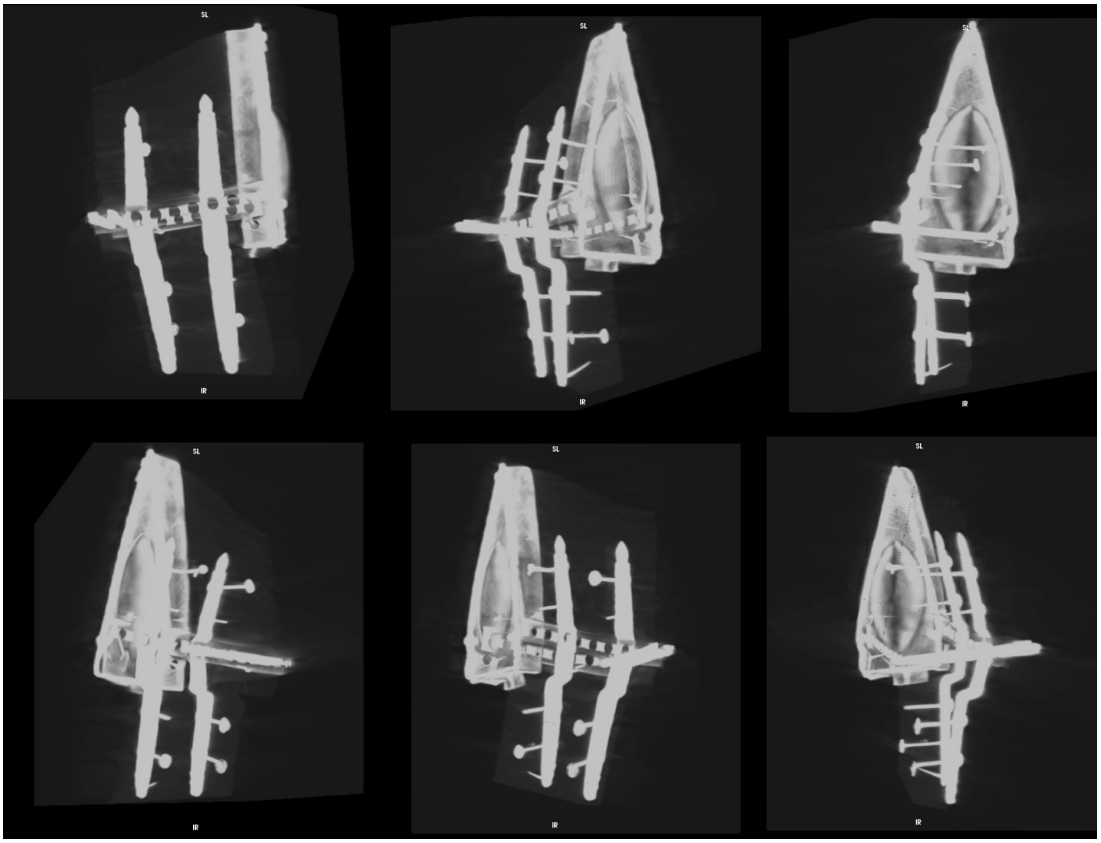

Figure 3.49: *snapshots from a video clip of a tomogram of the end of the Lamont harp neck, showing the rivets and nails fastening the straps to the neck and forepillar. Note that the top rivet for strap #1 (the strap closest to the end cap) is split at the end. Note also the small nail extending into the forepillar from underneath the animal head at the lower end of strap #1. The nails fastening the end cap to the neck are also visible. All except two of the tuning pins were removed from this portion of the cheekband for the CT scanning.*

Metal repair patches

This section discusses two metal repair patches on the crack in the neck of the Lamont harp. These have been previously discussed by Armstrong, and by this author, along with the other repair work to this crack.[300] Here they are examined in terms of decorative work and alloy composition. Figure 3.50 shows their locations on the neck of the harp.

[300] Armstrong, *Irish and Highland Harps*, 164, and Plate III, opp. 162; Loomis, "Structural Breaks and Repairs," 30 – 34; and Loomis et al., "Lamont and Queen Mary Harps," 121.

Figure 3.50: *metal repair patches on the Lamont harp (arrowed), viewed from both sides of the neck. The patch on the right-hand side of the neck (top) is a long thin strip that runs under the neck to the other side, and is the same patch that is visible on the right in the lower photograph. Photographs: Maripat Goodwin.*

Each patch is a thin sheet of copper alloy tacked to the wood with several small nails. One is a small rectangular piece nailed over the crack on the left-hand side of the neck. The other consists of a long strip that runs under the neck from one side of the harp to the other, passing underneath both cheekbands. On the right-hand side of the harp this strip is pierced for tuning pin holes #2 and #3, and on the left-hand side it is pierced for tuning pin hole #1. This would seem to cast some doubt on the suggestion, put forth in Chapter 2 of this dissertation, that the #1, and eventually the #2, tuning pin holes were not used after the neck cracked. A possible explanation for the holes in the patches can be seen in early photographs of the harp, which show a square headed plug occupying the #1 tuning pin hole. It is possible that the #2 tuning pin hole may have had a similar plug inserted into it as well. The plug in hole #1 is

shown in the 1807 engraving of the harp published in Gunn's treatise, so it dates to at least the early 19th century.[301] This plug is no longer on the harp. In the archival conservation photographs (mentioned earlier with regard to the end cap) it is present early on in the conservation work, but is later absent. In a photograph of the left-hand side of the neck taken at this time, it is apparent that the 'plug' is actually a square headed bolt with a square nut. Figure 3.51 shows an early 20th-century photographic plate, and one of the circa 1980's conservation photographs. The plug is present in the earlier photograph, and absent in the later photograph.

Figure 3.51: *detail of an early 20th-century archival photograph of the Lamont harp (left), and the same area from an undated (possibly early 1980's) archival conservation photograph (right). Note that the square headed plug in tuning pin hole #1, present in the earlier photograph, is absent in the later photograph (white arrows). Note also that there is a metal strap across the neck/soundbox joint that is present in the earlier photograph, but absent in the later photograph (black arrow).*[302] *Photographs: National Museums Scotland archive H.LT2.*

It is unfortunate that this small fixture on the harp was removed during conservation, but the early archival photographs may at least reveal why the repair strip is pierced at the tuning pin holes. More significantly, however, it is also apparent from these

[301] Gunn, *Historical Inquiry*, Plate I, opp. 4. For a published early photograph, see Armstrong, *Irish and Highland Harps*, Plate I, opp. 158. Armstrong also shows this on his engraving of the harp in Plate IV, opp. 166.

[302] The author gratefully acknowledges Michael Billinge for pointing out the presence of the strap across the neck/soundbox joint in the earlier photograph.

photographs that a large metal strap extending across the neck/soundbox joint, similar to the strap on the Queen Mary harp, was removed as well.[303] This strap (which incorporates the short strap that wraps half-way around the soundbox, also missing in the later photograph) may have been an historical repair, so it is unfortunate that it was removed during relatively recent conservation work.

With regard to the metal patches, both are decorated with lines pressed into the thin sheet metal, and are cut with scalloped ends, as shown in the photographs in figure 3.52.

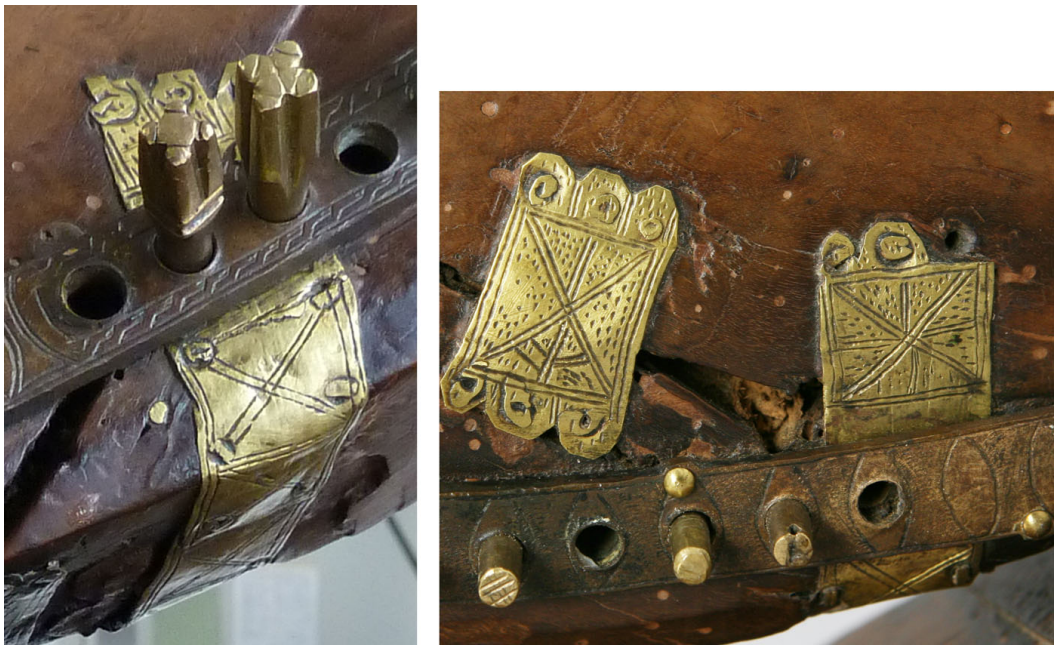

Figure 3.52: *decorative work on the Lamont neck repair patches. The right-hand side of the neck is shown on the left, and the left-hand side of the neck is shown on the right. Photograph (right): Maripat Goodwin.*

The scalloped ends and decorative designs give these patches the appearance of banners or flags. Whether this was the intention is unknown. If they were intended to be flags, the possible interpretation is interesting, however. The long repair patch, shown in the left-hand photograph in figure 3.52, is decorated with five rectangles.

[303] ibid. This strap is also mentioned by Armstrong, *Irish and Highland Harps*, 166.

Four contain a cross that could be interpreted as a saltire, or cross of St. Andrew, which could represent the flag of Scotland.[304] The fifth rectangle contains a pair of overlapping crosses, which bears some resemblance to an early version of the current Union Jack, created after the union of the crowns in 1603.[305] The version of this flag preferred in Scotland in the 17th and early 18th centuries would have had the cross of St. Andrew uppermost, which is how the two overlapping crosses on the repair patch are arranged.[306] Although this interpretation of the decorative work is only speculative, the flag interpretation does create a compelling visual metaphor, with the repair patch bridging the two sides of the crack to bind them together. The decorative design on the smaller repair patch is somewhat different, and its interpretation remains obscure.

The longer of the two repair patches was analysed with XRF to determine the composition of the alloy. The results, given in table 3.6, show that it is a high zinc brass with a significant percentage of tin. The trace elements nickel and silver were not detected. This composition is different from that of the other analysed copper alloy fixtures on the neck, and is therefore unlikely to be related to them.

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[304] Documented use of the saltire as the flag of Scotland dates to at least as early as the mid-16th century. See, for example, the depiction of the saltire as the flag of Scotland on the title plate of the *Lindsay Armorial*, David Lindsay (circa 1542), National Library of Scotland, Adv.MS.31.4.3.

[305] F. Edward Hulme, *The Flags of the World: Their History Blazonry and Associations* (London: Frederick Warne & Co., 1891), 44 – 45.

[306] Hulme, *Flags of the* World, 45 – 46. Hulme quotes a letter dated 7 August, 1606 from the Scottish Privy Council in Edinburgh to King James objecting to the placement of the English cross of St. George on top of the Scottish cross of St. Andrew on the Union flag, as had been specified by proclamation in 1605. Hulme also notes that a depiction of the Union flag with the saltire uppermost appears in a 1701 publication. A circa 1617 ceiling boss from Linlithgow Palace depicts the Union flag with the saltire uppermost: National Museums Scotland, "Ceiling boss of painted wood from Linlithgow Palace, West Lothian," accessed 20 June, 2014, http://nms.scran.ac.uk/database/record.php?usi=000-100-000-709-C.

Table 3.6.

Composition of Lamont harp neck repair patch[307]

	Fe	Ni	Cu	Zn	As	Pb	Ag	Sn	Sb
Lamont harp neck repair (long strip)	0.1	0.0	67.2	31	0.3	1.3	0.0	6.0	0.0

Note: surface composition from semi–quantitative XRF analysis. Values are wt% for each element. The maximum measurement uncertainty is +/– 0.2%.

Because this patch is a strip of sheet metal, the presence of lead suggests it may have been recycled from a cast object. Lead was added to improve the flow of the molten alloy for casting, and would not have been added to brass that was intended to be worked into sheets.[308] The presence of a significant quantity of tin also points to the use of recycled material, such as bronze. While not definitive, the relatively high percentage of zinc, at 31%, is less likely to be found in brass made before circa 1700 than in later brass.[309]

The absence of both nickel and silver means the copper likely originated from non-nickel and non-silver bearing ore. Perhaps significantly to this discussion, in 1691, after a century of failed attempts at establishing copper and brass production in the British Isles, the English Copper Company was established, opening mines in Cornwall.[310] Copper ore from Cornwall is both non-silver and non-nickel bearing, whereas the sources of copper from continental Europe contain either nickel or silver.[311]

Bearing in mind that it is not possible to draw any definitive conclusions from the composition of the alloy, as the above observations are generalizations only, it does suggest the possibility that this repair might date to no earlier than circa 1700. The

[307] Jim Tate and Susanna Kirk, "XRF analysis of the Queen Mary and Lamont harps."
[308] Mitchiner et al., "Nuremberg and its Jetons," 124.
[309] Mitchiner et al., "Nuremberg and its Jetons," 130 – 47.
[310] Pollard and Heron, " Medieval and Later Brass Industry," 203.
[311] Mitchiner et al., "Nuremberg and its Jetons," 125 – 26.

relatively high percentage of zinc observed would also be consistent with this lower limit on the date. This is interesting, as it would mean these repair patches may have been added very late in the working life of this harp, when it was in the possession of its final historical player, John Robertson of Lude.

Summary

The neck of the Lamont harp holds a number of tantalizing clues to its construction and repair history. Some of the metal fittings are not original to the construction, and are either modifications or replacements. This includes the straps across the neck/forepillar joint and a number of the tuning pins, but may also include the end cap, and possibly even the cheekbands, although the evidence is not conclusive. Some evidence points to a possible late 16th-century date for one (or both) of the cheekbands, the end cap, and perhaps even the tuning pins in Group A, the largest matched set. There is, however, also evidence that may point instead to an earlier, late 15th-century date for the end cap and the 'Group A' tuning pins.

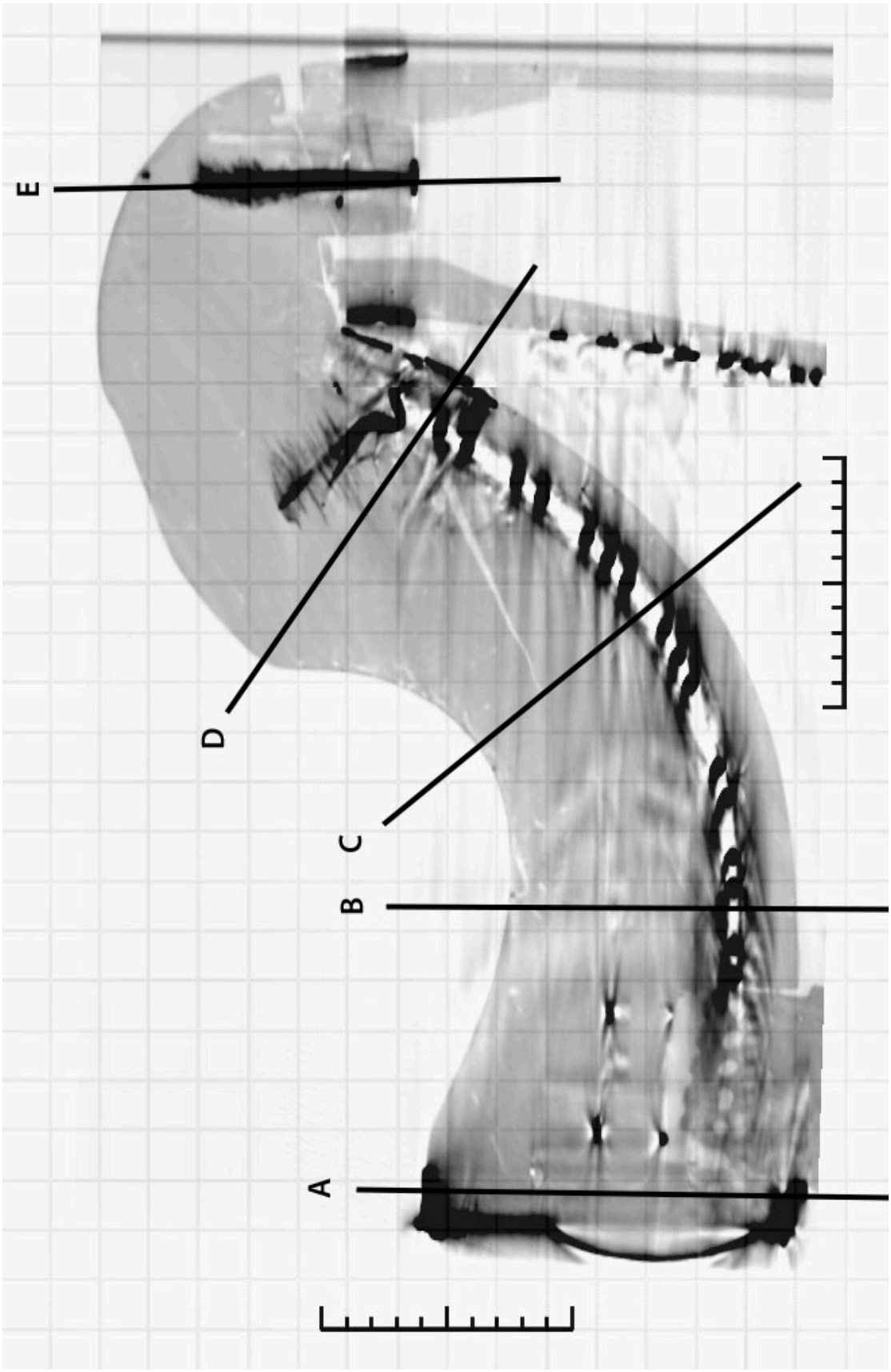
Further research will be needed to establish a timeline for the construction and repair history of the Lamont harp neck. Based on current evidence, it is possible that the neck dates to the second half of the 15th century, and was refurbished in the late 16th century, with replacement or addition of some of the metal fittings, possibly including the cheekbands. Further work is needed to determine whether or not the cheekbands are replacements, however.

Cross-sections

The dimensions of the neck in its current state are shown in the tomographic cross-sections below. The tomogram in figure 3.53 is a lengthwise cross-section. Because the neck is not straight, a composite of three cross-sections was used in order to clearly show its entire length. The lines labeled A – E in figure 3.53 indicate the

locations of cross-sections taken across the neck. These are shown in figures 3.54 – 3.58. For all of these figures, the grey-scaling has been set to accurately represent the location of the physical edge of the wood, and the dimensions given in the figures were measured using the method already described. In each of the cross-sections in figures 3.54 – 3.58, the line in the left-hand image indicates the location of the cross-section shown on the right, and the measurements shown were taken at the location of the lines indicated on the cross-section. The right-hand side of the harp is on the left, and the view is from the perspective of 'looking up' the neck from the bass end.

Figure 3.53 (overleaf): *composite tomographic cross-section of the neck of the Lamont harp. This cross-section also shows the forepillar tenon in the neck mortise, and the neck tenon in the soundbox mortise. The lines A – E indicate the locations of the individual cross-sections shown in figures 3.54 – 3.58. Scale 1 tick : 1 cm; grid scale 1 square : 2 cm.*


E
D
C
B
A

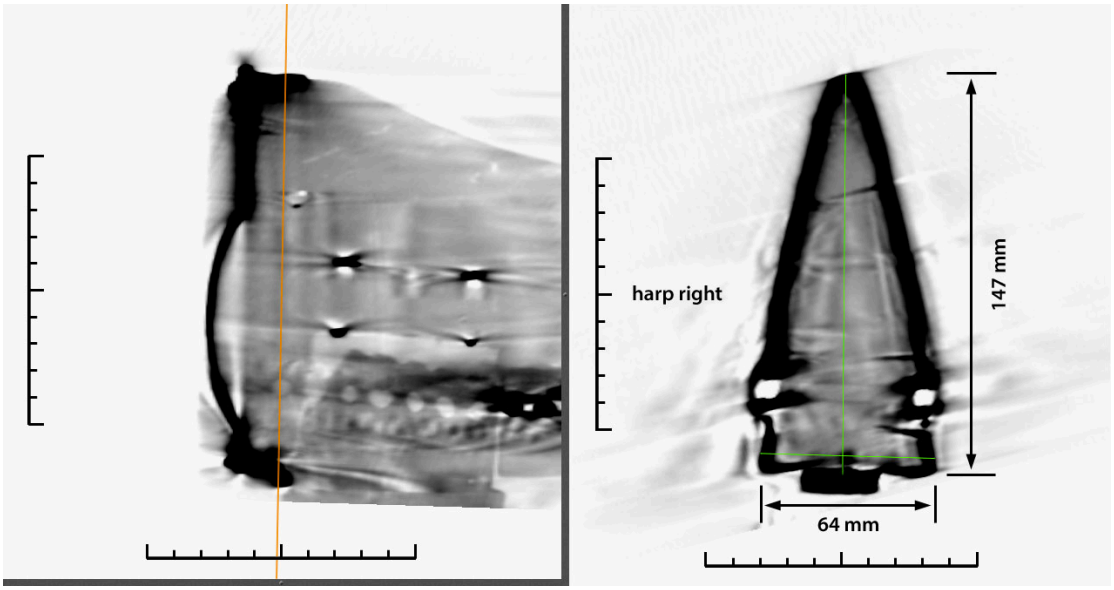


Figure 3.54: *Lamont neck cross-section A (see figure 3.53). This is a cross-section through the end cap. The image artefacts are due to the metal end cap and cheekbands. Scale 1 tick : 1 cm.*

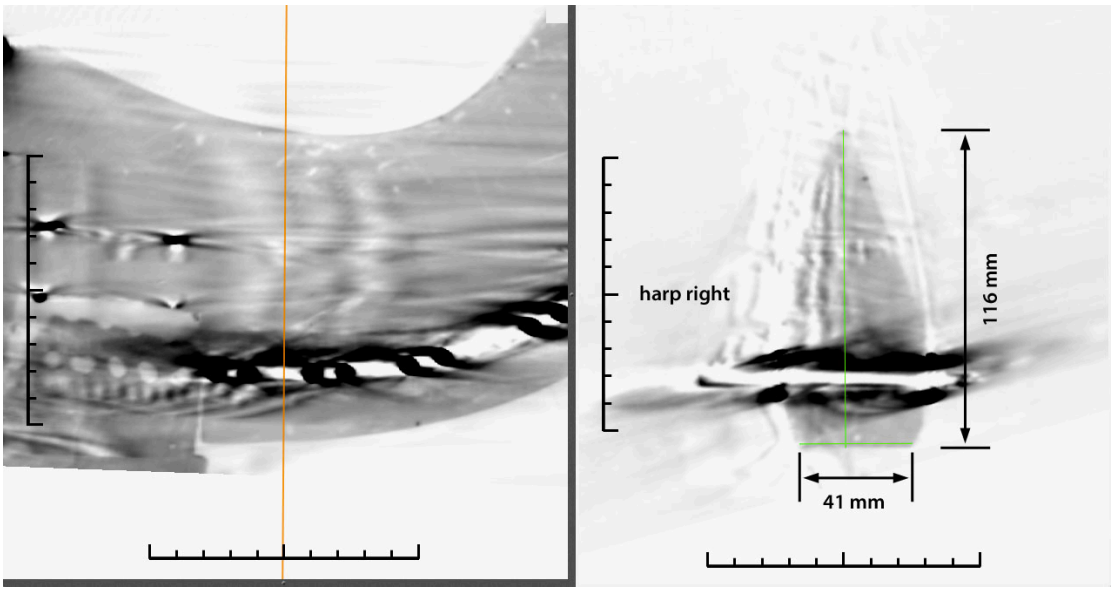


Figure 3.55: *Lamont neck cross-section B (see figure 3.53). The image artefacts are due to the metal end cap, cheekbands, and tuning pins. Scale 1 tick : 1 cm.*

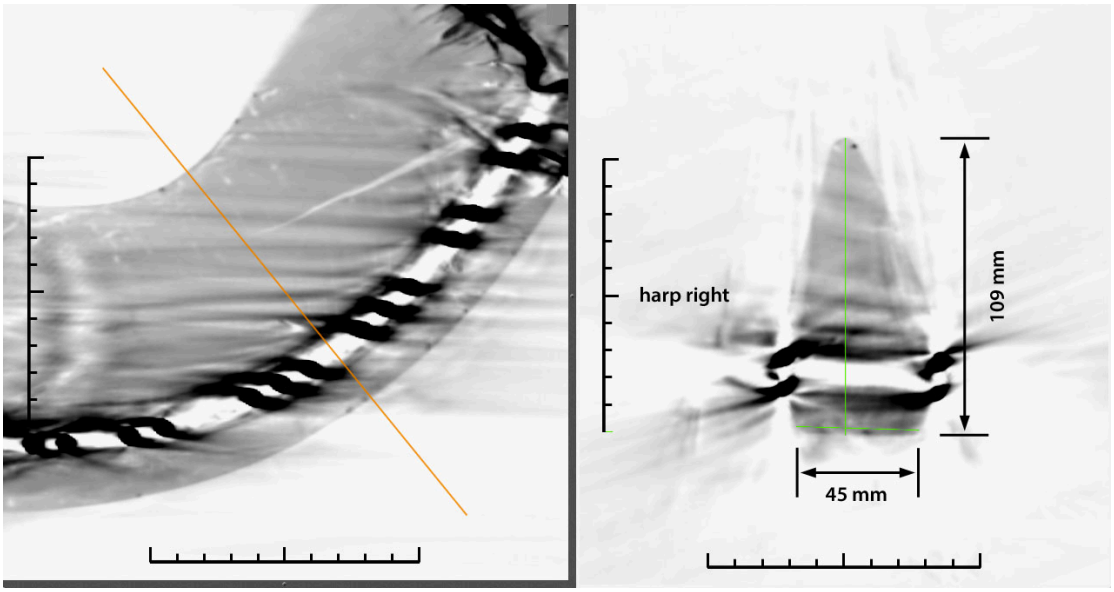


Figure 3.56: *Lamont neck cross-section C (see figure 3.53). The image artefacts are due to the cheekbands and tuning pins. Scale 1 tick : 1 cm.*

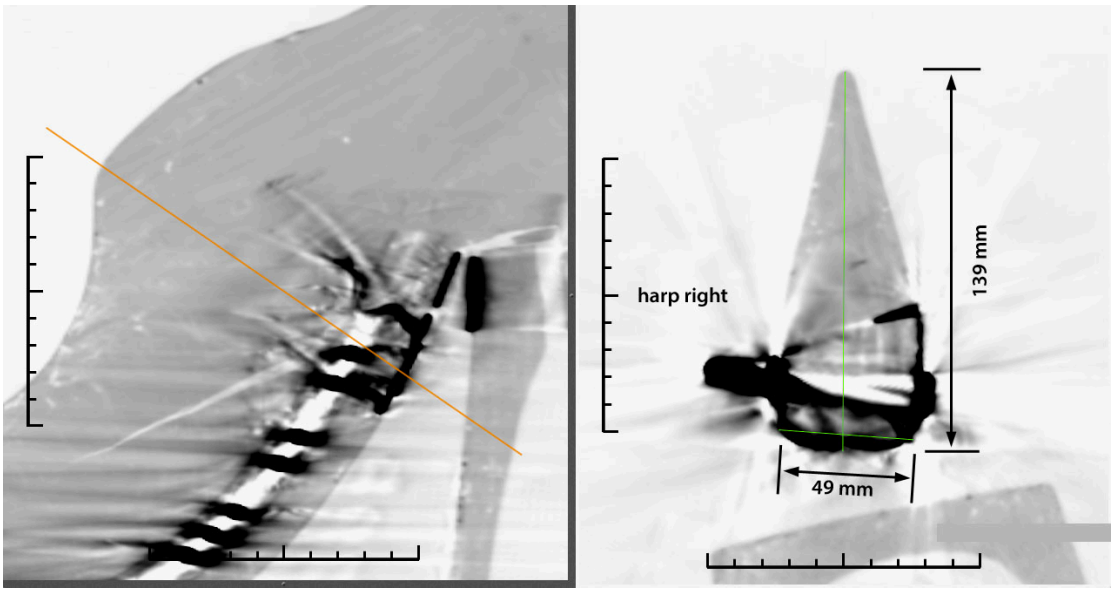


Figure 3.57: *Lamont neck cross-section D (see figure 3.53). This cross-section passes through some of the metal repair work to the crack in the neck. There is a strip of brass sheet metal on the underside of the neck at this location. The image artefacts are due to the cheekbands, tuning pins, and metal repairs to the crack in the neck. Scale 1 tick : 1 cm.*

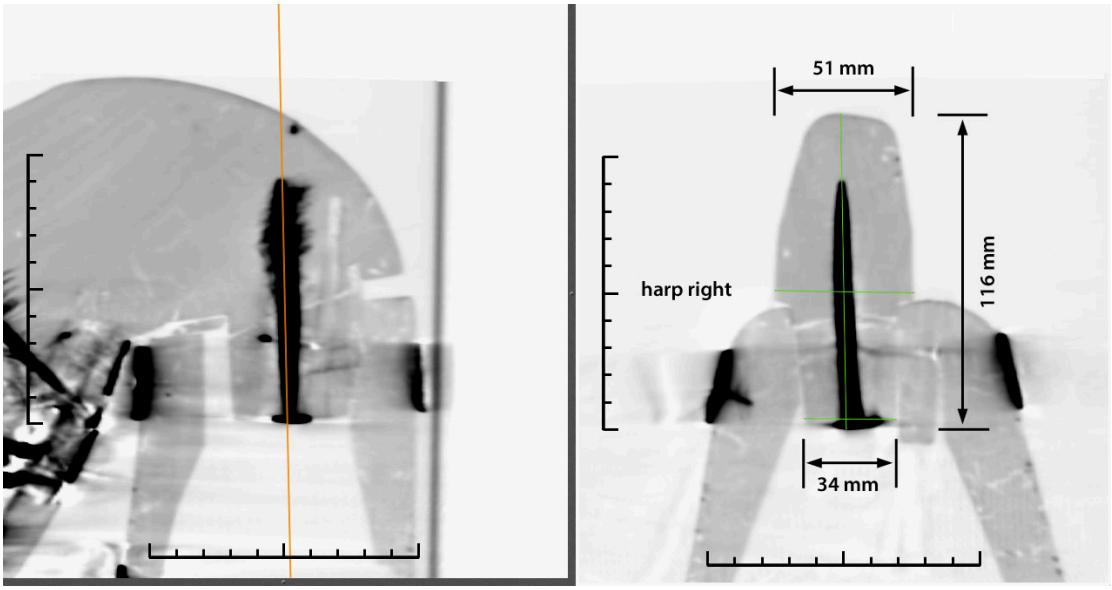


Figure 3.58: *Lamont neck cross-section E (see figure 3.53). This cross-section passes through the neck tenon and an iron spike in the tenon.*[312] *The separate block to one side of the tenon is a repair. Scale 1 tick : 1 cm.*

[312] For a discussion of the spike and other internal repairs to the neck at the soundbox joint see Loomis, "Structural Breaks and Repairs," 35 – 41.

Soundbox

As discussed in Loomis (2010) and Loomis et al. (2012), the soundbox of the Lamont harp is constructed of a single half sawn timber, oriented with the central growth rings towards the front of the box.[313] Some features of the construction, damage, wear and repairs to the soundbox have already been discussed in Part I of this dissertation, specifically the construction and behaviour of the joint with the neck, the rise of the soundbox belly, the wire fragment embedded in string hole #14, and the toggle and wire marks around the string holes. An overview of damage and repairs to the soundbox was also presented in Loomis (2010).[314] This section discusses further evidence of wear and use in the context of understanding its working life, and presents measured cross-sections of the soundbox, including a contour map of the thickness of the front face, which acts as the 'soundboard'. The wood from which the soundbox has been made is discussed separately in Chapter 5, along with the soundbox wood of the Queen Mary harp.

String shoes

The Lamont harp string shoes are described and illustrated in Armstrong (1904), and are shown here in the photographs in figure 3.59.[315] As noted in Armstrong, they are of two distinct designs. The first three shoes in the treble, and the last two in the bass are horseshoe shaped with quatrefoil ends, whereas the remainder are eyelet shaped with an arm extending from each side, ending in a trefoil. Armstrong proposes a possible explanation for the presence of two different designs by noting that the arms of the eyelet shaped string shoes would have overhung the edge of the string band on one side had they been used for the first three string holes, due to the deflection of the line of string holes away from the centre of the string band at this end of the soundbox. This would explain the use of the narrower horseshoe shaped shoes for

[313] In other words, the front of the soundbox faces the centre of the tree from which it was cut. Loomis et al., "Lamont and Queen Mary Harps," 115.
[314] Loomis, "Structural Breaks and Repairs," 11 – 23, and Loomis et al., "Lamont and Queen Mary Harps," 115 – 19.
[315] Armstrong, *Irish and Highland Harps*, 160.

these holes, although it does not account for their use on the last two string holes in the bass.[316]

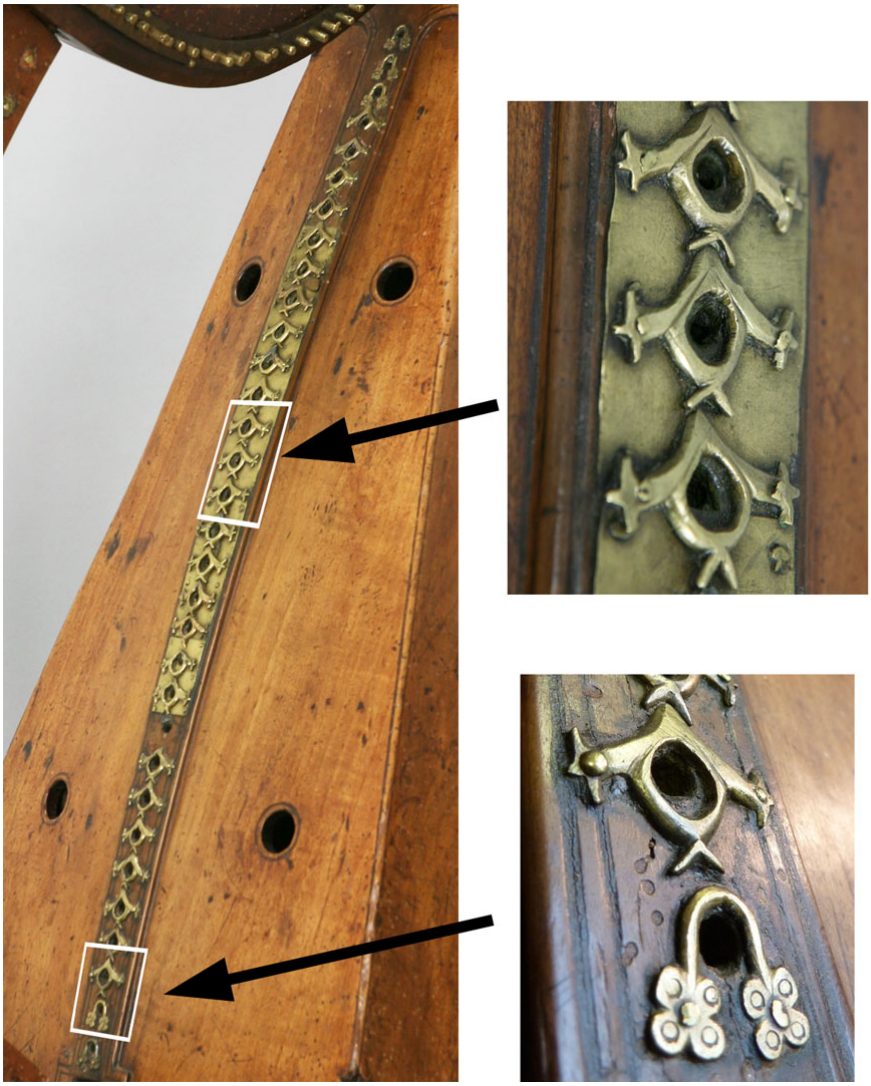


Figure 3.59: *Lamont harp string band and string shoes. There are two designs of string shoe (lower right inset).*[317] *The first three shoes in the treble, and the last two in the bass are horseshoe shaped with quatrefoil ends. The remainder are eyelet shaped with an arm extending from each side, ending in a trefoil. A section of the string band is reinforced with thin sheets of brass underneath the string shoes (upper right inset). Photographs (left, and upper right): Maripat Goodwin.*

[316] ibid.
[317] Armstrong, *Irish and Highland Harps*, 160.

One possible explanation for the presence of two different designs of string shoe might be that one set consists of replacements. Based on the nail hole patterns, however, this does not appear to be the case. The two designs of string shoe have different nail patterns, but no extra nail holes have been observed at the string holes. This can be seen in the photograph of string hole #23, shown in figure 3.60, and the photograph of string holes #1 – 3, shown in figure 3.61. At string hole #23, which is missing its string shoe, there is only one set of nail holes (corresponding to the eyelet shoes), and there are no nail holes corresponding to the eyelet shoes at string holes #1 – 3. So it is possible that the current arrangement of the two designs of string shoes is original.[318]

Figure 3.60: *string holes #22 – 24 on the Lamont harp soundbox. Hole #23 is missing its string shoe. Nail marks positioned for the eyelet shaped shoe are visible either side of the string hole, but there are no additional nail marks in the expected position for one of the horseshoe shaped string shoes.*[319]

[318] This does not rule out the possibility that one or both sets of shoes might have been salvaged from another harp, though.

[319] Note the scrap of metal (possibly lead) inserted into the hole on the treble side in place of the string shoe. This shoe may have been lost during the working life of the harp.

Figure 3.61: *string holes #1 – 4 on the Lamont harp soundbox. The first three have horseshoe shaped string shoes. Note that there are no additional nail holes next to them, indicating that they are not replacements for the eyelet shaped string shoes.*

An explanation for the use of two types of string shoe is suggested by Armstrong's observation that the shoes reinforce the string band against splitting as the belly rises, in addition to protecting the string holes from being cut through by the wire strings.[320] It is possible that the builder decided that the eyelet shaped shoes, with their wider arm span, would provide better reinforcement where the soundbox would be pulled up by the strings.

[320] Armstrong (1904), Armstrong, *Irish and Highland Harps*, 160.

Although the shoes are of two different designs, both appear to be copper alloy. It would be of interest to compare the composition to determine if they might have been made together, and to compare them to the composition of other metalwork on the harp, such as the tuning pins. Five of the 'eyelet shaped' shoes are of a distinctly redder hue, and it would also be of interest to compare the composition of these to the others. Due to the geometry of the harp, it was not possible to analyse the composition of any of the string shoes, however it may be possible to do this in a future study with the use of a handheld XRF spectrometer.

As mentioned in the introductory paragraph to this section, the Lamont harp string shoes show possible signs of wear from the strings. This was discovered during visual examination of this harp for the present study, and is the first instance in which possible string shoe wear has been observed and recorded for any of the surviving Irish harps. Figure 3.62 is a photograph of string shoe #10, enlarged to show detail. A groove (actually a pair of overlapping grooves) is clearly visible on the edge of the shoe, and there is a corresponding notch in the wood at the edge of the string hole. The groove and notch are located where the wire string would press against the string shoe and the wood. Upon close inspection, it was found that nearly all of the string shoes have similar grooves, and they all appear to be positioned where the string would press against the shoe.[321] Many have multiple grooves, either closely spaced or overlapping as on the shoe for string hole #10. Two shoes (#19 and #23) show signs of repair in this area, with lead solder over deeply incised grooves.

[321] Loomis et al., "Lamont and Queen Mary Harps," 119.

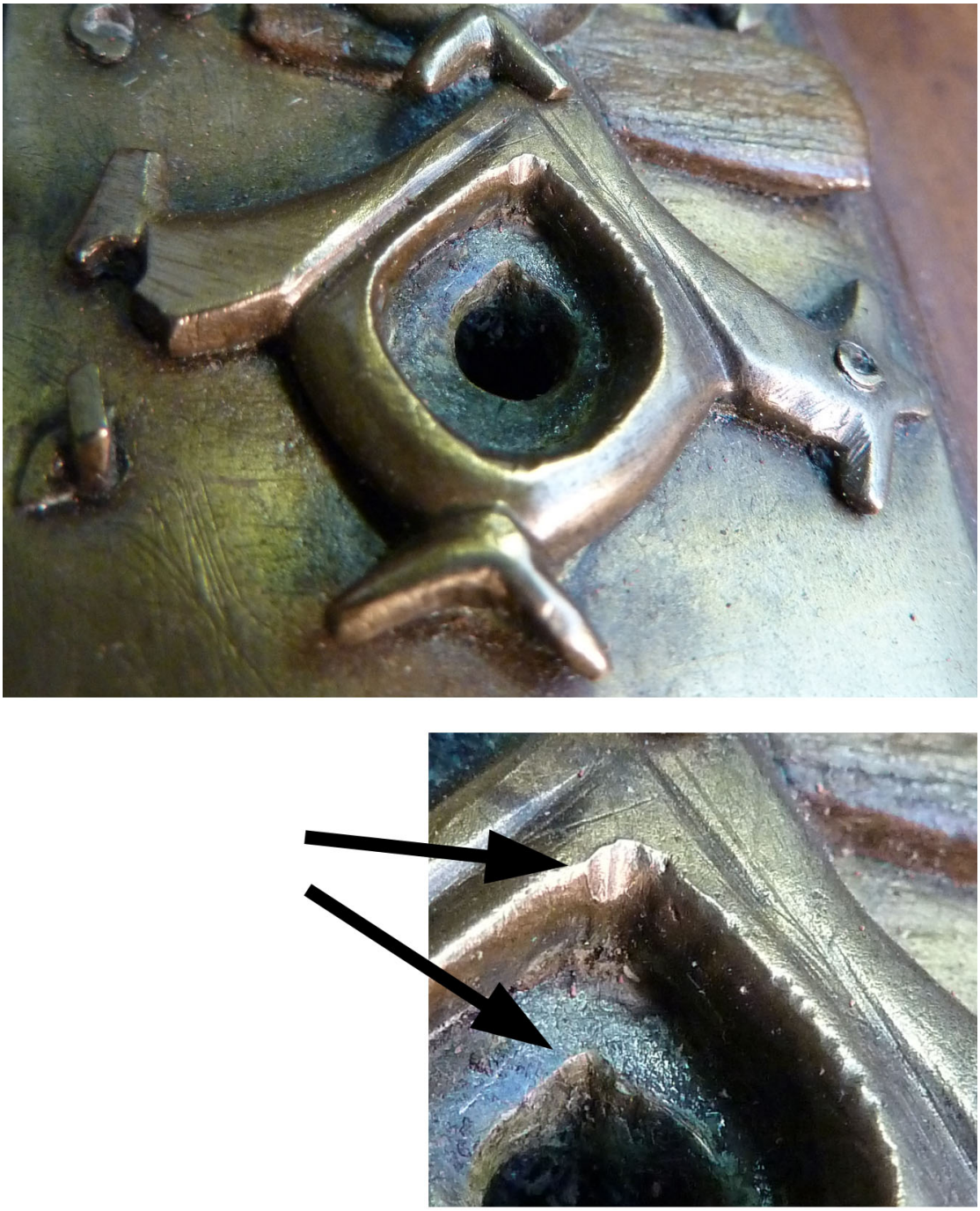


Figure 3.62: *shoe at Lamont harp string hole #10. There is a pair of overlapping grooves in its edge and a corresponding notch in the string hole (inset, arrowed). Note also the several smaller notches along the edge of the shoe on the right hand side.*

Towards the treble end of the string band, the positions of the grooves in the string shoes correspondingly shift where the strings are angled more towards the left side of the harp. This can be seen in the photographs of string shoes #5 and #6 in figure 3.63.

Figure 3.63: *shoes at Lamont harp string holes #5 (top) and #6 (bottom). These string shoes have grooves positioned towards the left side of the harp, corresponding to where the strings would be expected to contact them at the treble end of the string band. The presence of multiple grooves may be evidence of the frame becoming increasingly twisted, causing the direction of the strings to shift more towards this side of the harp.*[322]

[322] Note the verdigris stains in the area of the grooves on the shoe for string hole #6. These may have been left by copper alloy strings.

Based on the appearance and location of these grooves, it is probable that they were created by the friction of the string at the point of contact with the string shoe.[323] Each time a string is either tuned or struck, the wire slides a small distance along the edge of the shoe.[324] Although the motion is very small, many repetitions could cause the observed grooves.[325] Assuming this is what has happened, there is the implication that the strings that made these grooves were of a harder material than the string shoes; otherwise the wear would not have occurred. This is of interest because the hardness of the string shoes would place a lower limit on the hardness of the wire strings (bearing in mind that this is not necessarily representative of the stringing used for the entire working life of this harp). The string shoe material could be tested for hardness, however as this is a destructive test that might require temporary removal of one of the shoes, it may not be feasible to conduct this analysis at present.[326]

Although in most cases the grooves in the shoe align with notches in the wood at the edge of the string hole, for some shoes they do not, as shown in the photograph in figure 3.64. This does not necessarily mean these grooves were not created by the wire strings, however. The misalignment could be due to the string shoes being salvaged from another harp, as suggested in Loomis et al. (2012), although there is another probable explanation. As shown in figure 3.59, strips of brass sheeting were nailed onto a section of the string band, underneath the string shoes, to reinforce it where it had cracked.[327] Armstrong noted that several of the string shoes would have been removed and put back into place to allow for the sheet metal to be inserted underneath them.[328] The string shoes with grooves that are misaligned with the notches in the string holes happen to be located where the brass strips were added to

[323] Ann Heymann has suggested, alternatively, that the grooves could have been filed into the string shoes, possibly to alleviate buzzing of the string against the edge of the shoe (personal communication with the author).
[324] The front of the soundbox, which is somewhat springy, also moves up and down as the string is tuned or struck.
[325] The several small notches in the side of string shoe #10 could have been made by replacement strings being pulled up through the string hole.
[326] Martha Goodway and Jay Scott Odell, *The Metallurgy of 17th and 18th Century Music Wire* (Stuyvesant: Pendragon Press, 1987), 54 – 57.
[327] Loomis, "Structural Breaks and Repairs," 17 – 18.
[328] ibid.

the string band. It is probable that they were not put back in exactly the same positions after the brass strips were added. This would explain the observed misalignment of the notches and grooves. It also implies that the grooves in the string shoes predate the brass strips, which suggests this reinforcement to the string band may have been added late in the working life of this harp.

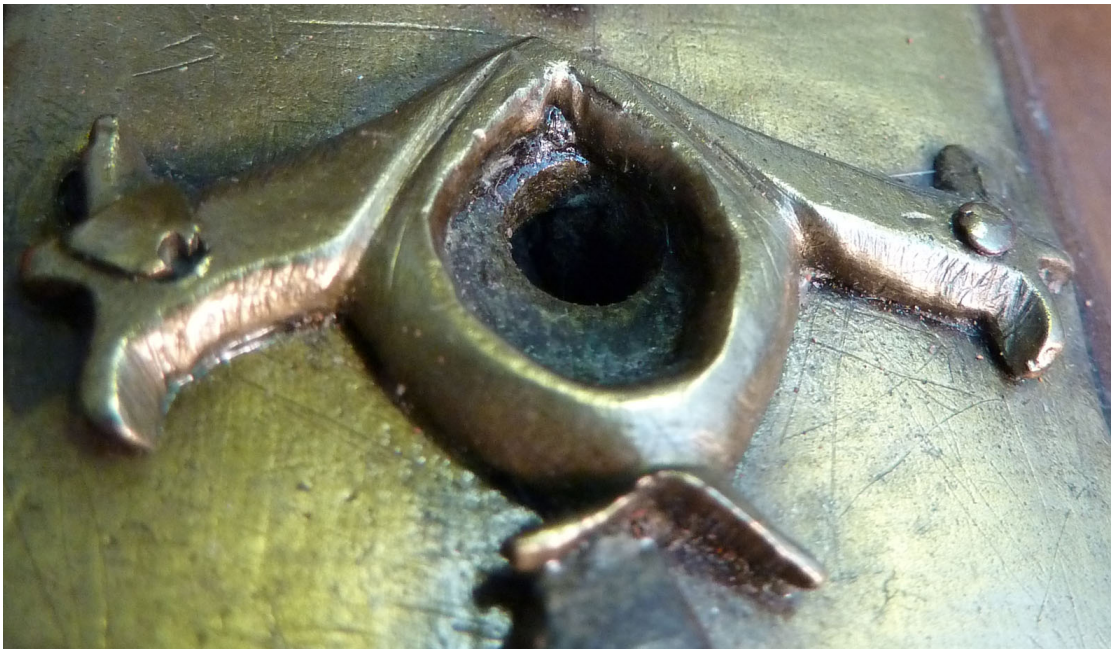


Figure 3.64: *shoe at string hole #11 of the Lamont harp. In contrast to the shoes at most of the string holes, the grooves do not appear to align with any corresponding notches in the string hole wood. The sheet metal underneath this shoe is a repair to the string band. The shoes lying on top of this repair were removed and repositioned back onto the string band, probably resulting in the misalignment of the wear marks in the shoes and the string holes.*

Another observation regarding the string shoes is that the grooves worn into them become less distinct towards both the treble and bass ends of the string band.[329] This is the case for both types of string shoe, so is not necessarily due to the different design of shoe. It may instead be an indication of which strings were used more often. Interestingly, aside from a general tapering off of wear towards the ends of the

[329] This coincides with the quantity of toggle marks observed around the string holes on the inside of the soundbox.

compass, there is also an apparent difference in the degree of wear on some individual string shoes as compared to others near to them. This could potentially provide clues to tuning and performance practice.[330]

It was also observed that the shoe on string hole #1 has no perceptible groove, and that the shoe on string hole #2 has a single very light mark. This is to be expected, based on what is understood about the damage to the top two tuning pin holes and the effect this is likely to have had on the stringing arrangement. Notably, there is a single light mark on the shoe for string hole #32, which suggests that this string hole may in fact have been used, at least at some point. The offset position of this mark, and of a similar mark on string shoe #31, is consistent with it having been used when the harp frame was in its current state, with the forepillar pulled over towards the left side. If it was, then it is also likely that it was after the top two tuning-pin holes had become unusable. It is possible that a straight string hole to tuning-pin stringing arrangement, missing out the top two string holes and tuning pins, was used at some point. A photograph of the shoe for string hole #32 is shown in figure 3.65.

[330] Strings that were regularly raised or lowered by a semi-tone, for example might generate more wear on the corresponding string shoe. A comparative study of the shoe wear could form the basis of future research.

Figure 3.65: *shoe at string hole #32 of the Lamont harp. There is a single light mark (arrowed), possibly from a wire string. The shoe at string hole #31 has a similar mark in the same location. The position of this mark is consistent with the use of this string hole with the forepillar pulled over towards the left side of the instrument, as it is currently.*

The grooves in the string shoes on this harp may provide an interesting record of wear that is indicative of the relative hardness of the wire strings, and reflects the changing shape of the frame, as well as possibly providing some indication of which strings were used more often. The following section examines the use of the string holes from the inside of the soundbox by taking a further look at the string toggle marks discussed in Part I of this dissertation.

Stringing marks inside the soundbox

The indentations observed around the string holes on the inside of the soundbox have been identified as having been made by the string toggles pressing against the wood, and have been discussed as an indicator of which string holes were used. They may also indicate how long the instrument was in use. Because a toggle mark is made when a string is brought up to tension, which normally only occurs when a string is replaced, the number of toggle marks around a string hole should indicate the number of times that string has been replaced. Although a string replacement may not always result in a new toggle mark, the number of these marks can at least be taken as an estimation of the lower limit of the number of string replacements for that string hole. While it is possible to see and tally individual toggle marks around the string holes at the ends of the compass where the marks are less numerous, in the middle third of the compass the string holes are saturated with toggle marks to the extent that it is very difficult to accurately count them.[331] The point of saturation appears to be reached at approximately 40 toggle marks. The actual number may be higher than this, but 40 can be taken as the lower limit. This number can, therefore, also be taken as an estimate for the minimum number of string replacements for each of these string holes. A possible minimum length for the working life of this soundbox can then be determined by estimating the frequency of string replacements. This quantity is not known, but based on current experience with harps strung with brass wire, a conservative estimate might be 5 – 6 years for the strings that are in frequent use. If the lower limit for the number of string replacements is 40, this implies that the working life of this soundbox was no less than 220 +/- 20 years.[332] The person understood to be the Lamont harp's last player, John Robertson of Lude, is known to have died in 1731.[333] The year of his death likely marks the end date of the working life of this harp. Based on this estimate of the length of the working life, the

[331] The number of toggle marks around each string hole is greatest in the middle third of the compass, and tapers off towards the bass and treble ends. This is a direct indication of the comparative frequency of string changes in the middle versus the ends of the compass, with the higher frequency of string changes likely being due to greater use of those strings.
[332] If the number of toggle marks has been underestimated, or if the frequency of string replacements has been overestimated, the calculated working life would be longer.
[333] Sanger and Kinnard, *Tree of Strings*, 214.

soundbox would have been made no later than circa 1490 – 1530. This suggests that a late 15th-century date of construction for the harp (or at least the soundbox) might be more likely than the late 16th-century date indicated by the cheekbands.[334]

There are additional marks in the soundbox that may also be indicative of string replacements. The historian John Lynch, writing in *Cambrensis Eversus* (1662), notes that the strings of the Irish harp were replaced via the sound holes on the front of the soundbox.[335] This method of string replacement, as it is currently practiced, requires hooking the new string onto another length of wire (fashioned with a loop or hook on its end) that has first been threaded through the string hole and soundhole. Figure 3.66 shows a string being replaced through the soundhole of the author's harp.

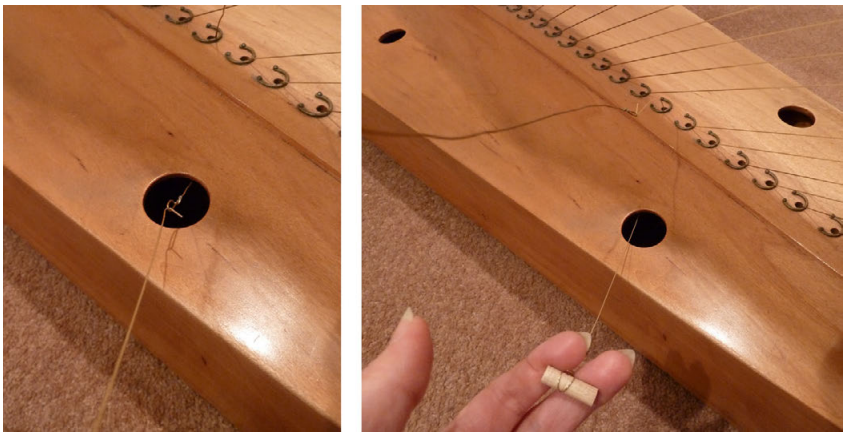


Figure 3.66: *replacing a string via a soundhole. The new string is hooked to the end of a length of wire that has been threaded through both the string hole and the soundhole (left). By pulling up on this wire, the string is then drawn into the soundhole and up through the string hole (right). The toggle prevents the end of the string from pulling through the string hole. Note the hooked end of the wire, visible in the left-hand photograph, which could scratch the inside of the soundbox as the string is drawn through the soundbox to the string hole. The harp shown is by Guy Flockhart (1996).*

[334] As noted earlier, the cheekbands may not be original.
[335] John Lynch, *Cambrensis Eversus,* vol. I, trans. Matthew Kelly (Dublin: The Celtic Society, 1848), 317. Strings would not have been replaced via the back of the soundbox because the board that encloses it would not normally be removable when the harp is under tension.

Note that in the restringing demonstrated in figure 3.66, the hooked end of the wire could easily leave a scratch inside the soundbox as the new string is drawn through it towards the string hole. Additionally, the wire used to thread the new string has to first be inserted into the string hole and fished out the soundhole. This is often accomplished with the aid of another piece of wire with a hooked end that is inserted into the soundhole to capture this wire and pull the end up through the soundhole. This process could also easily leave scratches inside the soundbox.

Although this method of string replacement may seem somewhat awkward, as noted in Loomis et al. (2012), there is evidence that it was used to replace strings on the Lamont harp. Upon initial visual inspection of the interior of the soundbox, numerous scratches were observed on the inside surface, in the area around the lower left-hand soundhole.[336] Under further examination with magnification, similar scratches were found in the vicinity of all four sound holes. Some of the scratches are concentric to the sound holes, consistent with the process of fishing for the drawing wire to pull it up through the hole. Most scratches generally point towards the string holes, with more pointing in the direction of the string holes in the middle of the compass. Their position and orientation is consistent with a method of string replacement similar to that described above and shown in figure 3.66. Most are located within 4 cm of the centre of each sound hole, and are very fine. They are most easily visible when viewed with magnification and adequate light. Under these conditions, the number of scratches observed was approximately 100 – 120 for each of the right-hand sound holes, and approximately 200 for each of the left-hand sound holes, for a total of approximately 600 – 640 scratches. The higher number at the two left-hand sound holes is also consistent with string replacement, as this is the side of the harp that has the string end of the tuning pins, so it is more convenient to replace a string from this side.

Figures 3.67 and 3.68 show some of the scratches around the lower right-hand and lower left-hand sound holes, respectively. It is not possible to estimate the number of string changes from these scratches, as any individual string change could result in

[336] Loomis et al., "Lamont and Queen Mary Harps," 117.

several scratches, or none. Their large overall number is, however, indicative of a large number of string changes, consistent with a long working life for this instrument.

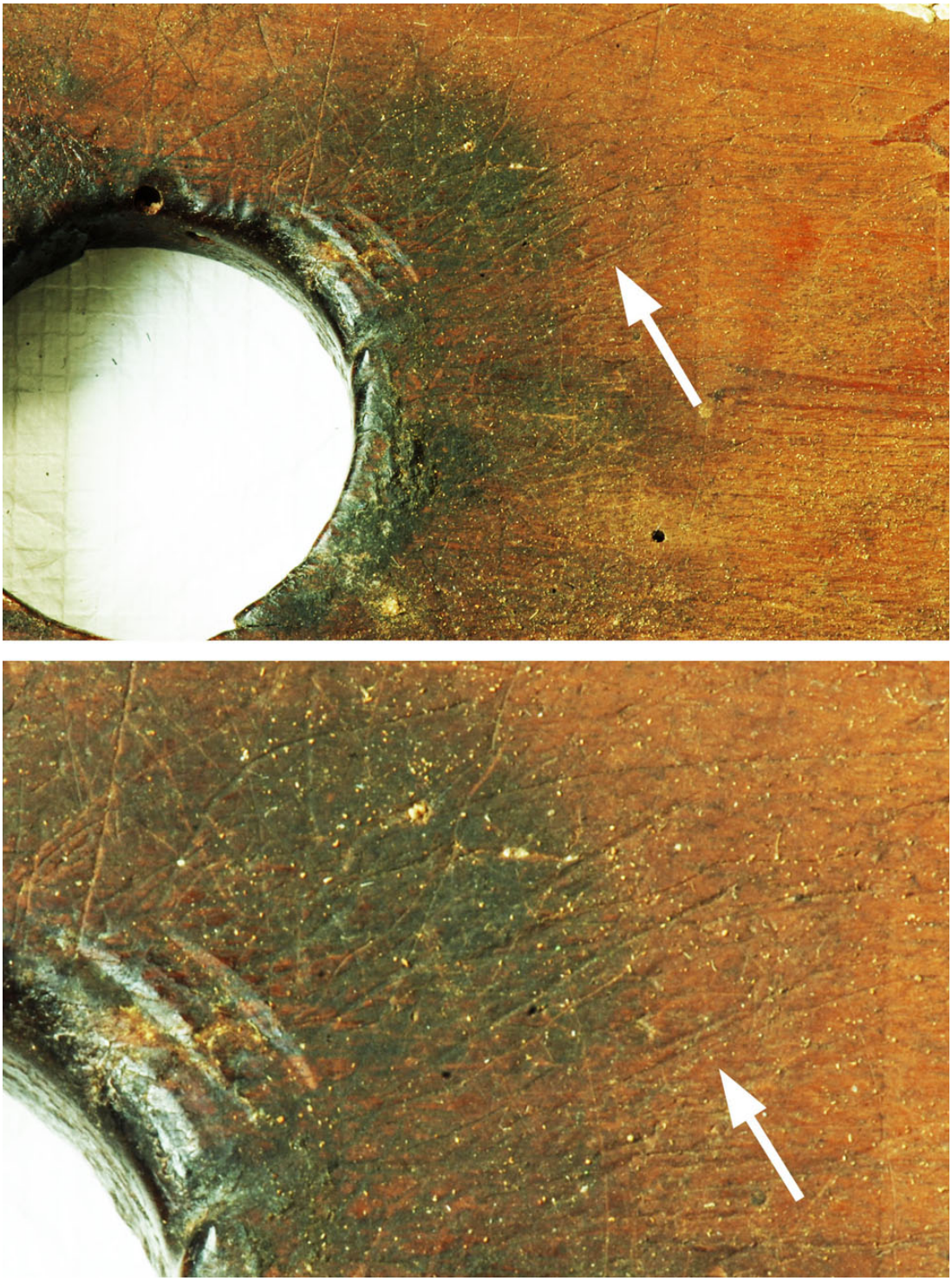


Figure 3.67: *scratches on the inside surface of the Lamont harp soundbox (arrowed), at the lower right-hand sound hole. The scratches predominantly point in the direction of the string holes and are consistent with the replacement of strings via the sound hole. Similar scratches were observed around the other three sound holes. The string band is towards the top of both photographs, and the middle of the compass is towards the top right. The contrast of both photographs has been enhanced to show detail.*

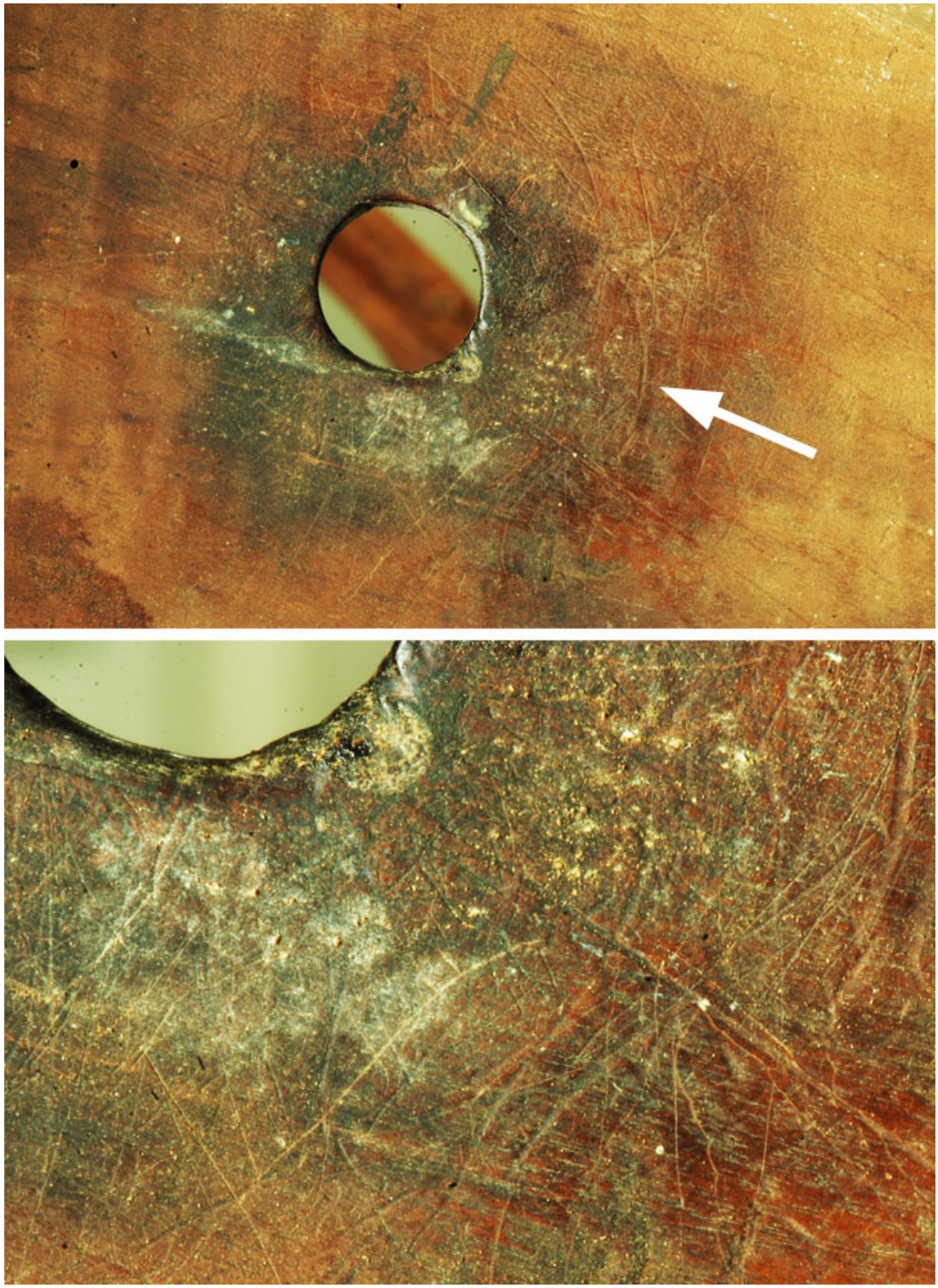


Figure 3.68: *scratches on the inside surface of the Lamont harp soundbox, at the lower left-hand sound hole. Note the semicircular scratches (arrowed). These are consistent with attempts to hook the drawing wire to pull it up through the sound hole. This is more likely to have been done from the left-hand side of the harp, as the string end of the tuning pins is on this side. The string band is towards the bottom of both photographs, and the middle of the compass is towards the bottom right. The contrast of both photographs has been enhanced to show detail.*

In the examination of the Lamont harp wire fragment in Chapter 1, the possibility that thin metal string toggles were used was discussed. The use of thinner, metal toggles has implications for understanding how these harps were strung. The scratches in the vicinity of the sound holes are consistent with stringing through these holes, as described above, in agreement with the historical account from the late 17th century. Both the Lamont and Queen Mary harps have string holes that are relatively large, however (~ 5 mm for the Lamont and ~ 5.5 – 6 mm for the Queen Mary). This is larger than is necessary to pass a wire string through, and is larger than the string holes on the soundboxes of the later, high-headed harps. The builder of the soundbox is not likely to make the string holes larger than they need to be, because they perforate the string band, and larger holes make it more vulnerable to splitting. There must, therefore, have been a reason for making large string holes, and this may have to do with the way the harp was designed to be strung.

It is plausible that the holes are this size because the soundbox was intended to be strung by inserting the toggled string directly into the string hole from the front, rather than by threading it up through one of the sound holes. Although the string holes on the Lamont and Queen Mary harps aren't large enough to insert a wooden toggle in this manner, they are large enough to insert a thinner, metal toggle. It is possible that the earlier, low-headed harps were originally strung in this manner, and that restringing through the sound holes was a later adaptation. It is notable that the string holes on the later high-headed Irish harps are significantly smaller, which may be a sign of a change in restringing practice along with the adoption of wooden toggles. Narrow and broad toggle marks are both clearly visible around the bass string holes (see figure 2.8, page 65). The two types of impressions may be due to metal and wooden toggles, respectively. If this is the case, then it is interesting to note that the narrow toggle marks underlie the broader ones. This is particularly apparent for the toggle marks around string hole #30 in this figure. If a switch from the relatively straightforward method of direct insertion of the toggle into the string hole to the more awkward method of restringing via the sound holes was prompted by changing from thinner metal to thicker wood toggles, there must have been a reason for the change to wood toggles. The possible reason is a matter for

speculation, but may eventually shed some light on changes in stringing practices for these harps.

Tool marks

As shown in figure 3.69, the sides and bass end of the soundbox interior appear to have been worked with flat bladed tools, probably chisels. The interior surface of the front of the soundbox is quite smooth, and appears to have been planed.

Figure 3.69: *tool marks in the interior of the Lamont harp soundbox. The sides of the box were worked with flat bladed tools, probably chisels, and have been left slightly rough. The front of the box appears to have been planed smooth.*

At the treble end, where the soundbox cavity transitions into the mortise for the neck tenon, there are gouge marks. These cover both sides and extend partially onto the front interior of the soundbox as shown in figure 3.70 (top). They were left by two different gouges, one with an approximately 1 cm blade (and numerous irregularly spaced nicks in its cutting edge), and another with an approximately 0.5 cm blade.

Both gouge marks can be seen in the photograph shown in figure 3.71. The marks left by the narrower gouge overlay those left by the broader one. The wood was worked in both directions, from the soundbox cavity towards the mortise and from the mortise towards the soundbox cavity. Both sets of gouge marks extend into the smoothed surface farther down in the soundbox, as shown in figure 3.70 (bottom), indicating that this work was done after the rest of the soundbox interior had been smoothed.[337] These marks may represent a later modification to the soundbox, possibly an effort to thin the sides and front in order to improve the response of the instrument in the treble. Additionally, as discussed in Loomis (2010), and Loomis et al. (2012), the soundbox mortise was enlarged at some point to make room for a reinforcing block of wood nailed to the side of the damaged neck tenon.[338] These gouge marks appear to also be associated with this work.[339]

[337] Loomis et al., "Lamont and Queen Mary Harps," 117.
[338] Loomis, "Structural Breaks and Repairs," 38. Loomis et al., "Lamont and Queen Mary Harps," 117.
[339] For a discussion of the damage and repair to the neck tenon see Loomis, "Structural Breaks and Repairs," 35 – 41.

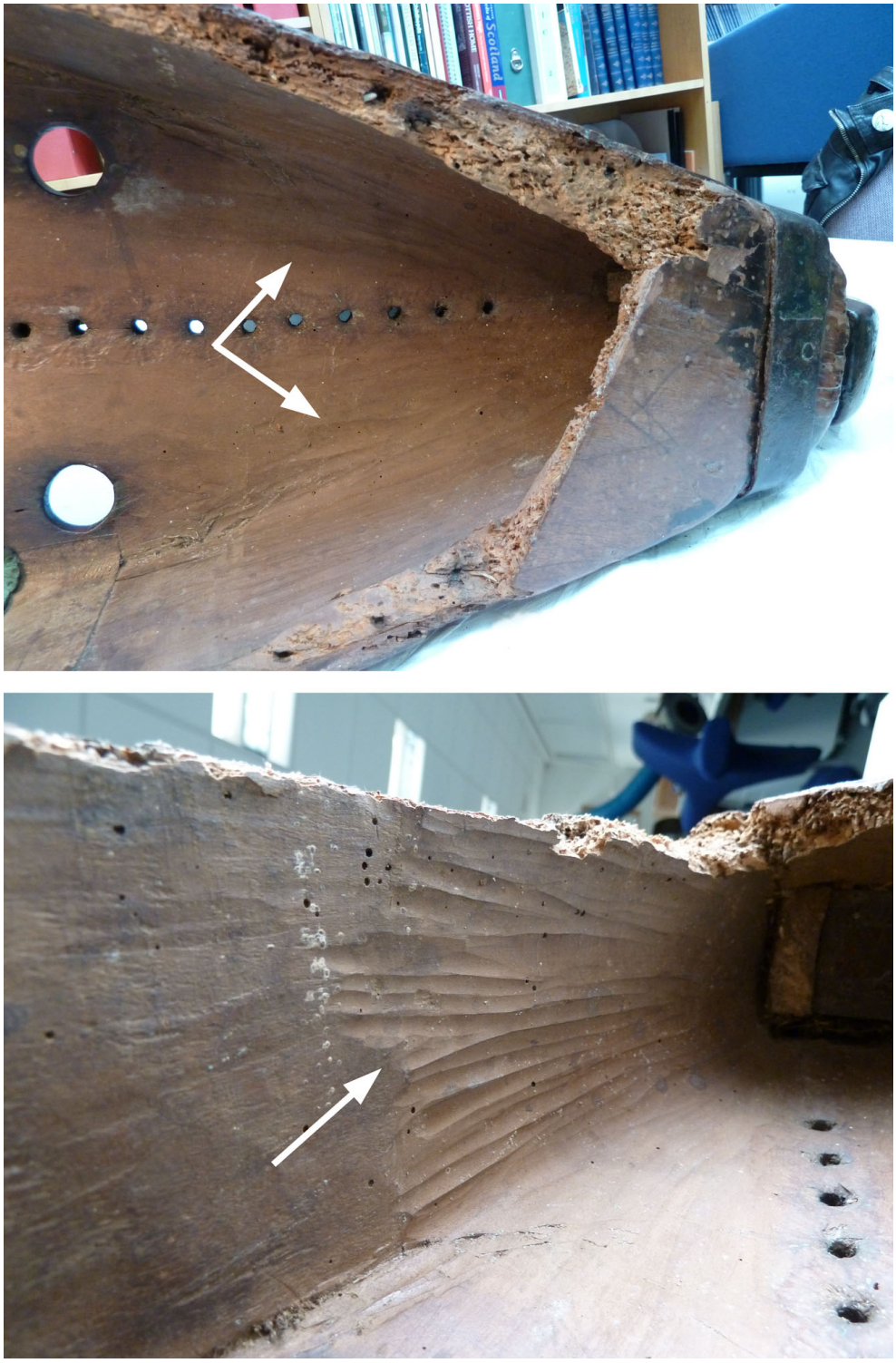


Figure 3.70: *gouge marks in the interior of the Lamont harp soundbox, at the treble end. The marks are on both sides, and the adjacent area of the front (arrowed, top), and extend into the smoothed surface (arrowed, bottom).*

Figure 3.71: *tool marks at the treble end of the Lamont harp soundbox interior. These marks were made by two different gouges, a ~1cm gouge (with numerous small nicks in its cutting edge), and a ~0.5 cm gouge. The view is of the right-hand side of the box. The treble end is toward the left, the front of the box is toward the bottom.*

Inscriptions

There are three known items of written text on the Lamont harp soundbox. The presence of one has been known for a number of years, and the other two were discovered during the course of the current research of this harp. The first runs down the right-hand side of the soundbox, and appears to read:

AL Stewar[t] of CLunie his harp 1650

As it is written, the last digit in the date could alternatively be read as a '6', however. The text has been scratched lightly into the surface, and the words are informally scrawled. Figure 3.72 shows the placement of the inscription on the soundbox. It has been traced over in the photograph to make it more visible.

Figure 3.72: *location of an inscription on the right-hand side of the Lamont harp soundbox. The text reads* AL Stewar[t] of CLunie his harp 1650 *(or* 1656*). The inscription has been traced over on the photograph to make it more visible. Photograph: Maripat Goodwin; annotations by the author.*

The inscription was observed by Christison (1969), who writes,

> "... as scratched on it, in a childish scrawl, can be deciphered A. C. Stuart of Clunie His Harp 1650."[340]

Chadwick (2012) notes that this may be the earliest mention of the presence of this inscription.[341] It is not mentioned by either Armstrong or Gunn, nor is it mentioned by Rimmer. Its presence became more widely known after it was observed and reported by the harp builder David Kortier in 2000.[342] As discussed elsewhere in this dissertation, archival conservation photographs of the Lamont harp show the instrument apparently in the process of being stripped of its surface coatings, possibly down to bare wood. It is likely that the inscription became more visible after this was done.

This inscription lies directly below a long crack in the soundbox and runs across some of the nails associated with a historical repair to this crack. Because the inscription includes a date, 1650 or 1656, it would be helpful to know if the crack or the nails were present when the lettering was scrawled onto the soundbox. Figure 3.73 shows the inscription in detail. By examining the letters, it may be possible to tell if their form or placement was affected by the presence of the crack or the nails, and therefore if the crack and its repair predate the inscription.[343]

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[340] A. F. Philip Christison, *The Clàrsach* (Inverness & Glasgow: An Comunn Gaidhealach, 1969). This source is a pamphlet published as no. 8 in a series. The author gratefully acknowledges Simon Chadwick for bringing this source to her attention, and for the information contained within it.
[341] Simon Chadwick, "The Lamont Harp: Inscription," last modified 28 February, 2012, http://www.earlygaelicharp.info/harps/lamontinscription.htm.
[342] David Kortier, "Trip to Scotland (2000)," accessed 27 July, 2014, http://www.kortier.com/subpages/scot.htm.
[343] The author gratefully acknowledges Simon Chadwick for suggesting this a number of years ago.

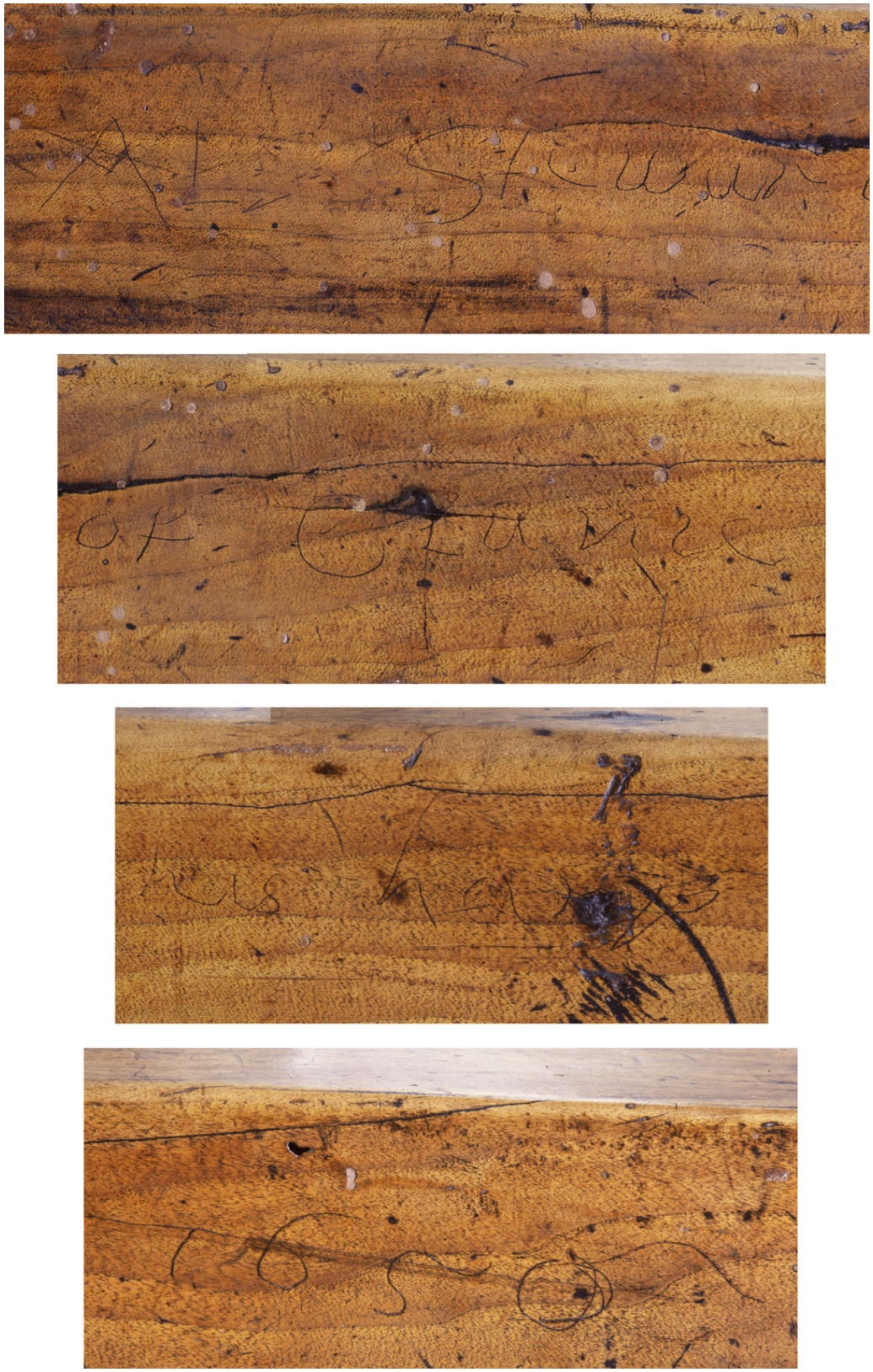

Figure 3.73: *photographs of the Lamont harp inscription shown in figure 3.72. The inscription lies directly below a long crack in the soundbox. The "r" in 'Stewar[t]' is directly below a widening in the crack. The "L" in 'Clunie' and the "r" in 'harp' are adjacent to nails associated with an historical repair to the crack.*

Examining the individual letters, it is evident that the 'L' in 'Clunie', and the 'r' in 'harp' both lie adjacent to nails that protrude through the wood, and the 'r' in 'Stewar[t]' lies directly below a widening in the crack in the soundbox. These three letters are shown in more detail in figure 3.74.

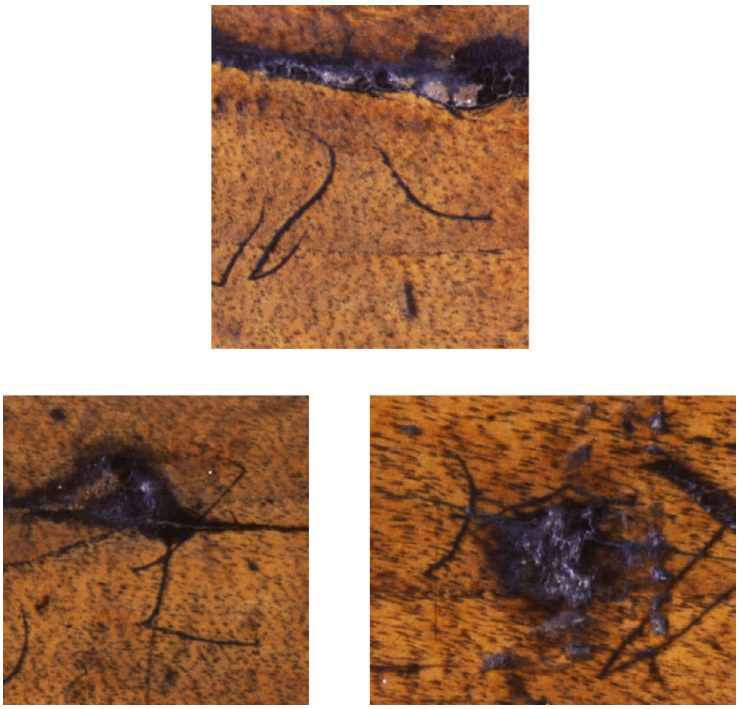

Figure 3.74: *three individual letters from the inscription shown in figure 3.73. At top centre is the 'r' in 'Stewar[t]', at bottom left is the 'L' in 'Clunie', and at bottom right is the 'r' in 'harp'.*

The placement of the "r" in 'Stewar[t]' (figure 3.74, top) is ambiguous with respect to the crack. It could just as easily have been written as it is with or without the crack there. With respect to the nails, the shape and placement of the other two letters is less ambiguous. Note the vertical stroke of the 'L' in 'CLunie'. It terminates at the nail, and is a bit short. Just below the nail there is a diagonal line that may have been added in an attempt to complete and lengthen this stroke past the nail. The 'r' in 'harp' also looks as though it was affected by a nail. The horizontal stroke appears to skirt awkwardly around the edge of the nail, following its contour. It appears from these

letters that the nails were likely present when the inscription was written, which means it post-dates the crack and its repair.

While the inscription contains a name and a date for someone who may have played this harp, without more information it is not possible to identify the specific Al Stewart to whom it refers. Keith Sanger has noted that there was more than one Alexander Stewart in the vicinity of Lude during the relevant time period, and that there was also more than one Clunie.[344] Clunie as a place name (and its variants Cluny and Clunes) as well as related names, such as Cluniemor, and Wester Clunie, appears in multiple locations near to one another, and near to Lude.[345]

One possible candidate for the person named in the inscription is an Alexander Stewart of Wester Clunie, who was born in 1639.[346] One argument against it being this Alexander Stewart is that he would have been only 11 years old in 1650, and the handwriting appears as though it may belong to an adult. The inscription could have been written retrospectively, however, or by someone else on his behalf, or perhaps the final numeral in the date is a '6', instead of a '0'.

This Alexander Stewart is particularly interesting, nevertheless, as he was related to the Robertsons of Lude (the family to whom the Lamont harp belonged) through his grandmother, Margaret Robertson of Faskally, the daughter of Alexander Robertson, 7th of Lude.[347] Margaret's grandparents were John Tarlochson/Robertson and Beatrix Gardyn (the same Beatrix Gardyn who is purported to have been gifted the harp now known as the 'Queen Mary' by Mary Queen of Scots).[348] Margaret Robertson is

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[344] Keith Sanger, e-mail messages to author, 1 July, 2011; 11 February, 2013; and 2 March 2013.
[345] For an historical map of the area around Lude, see Sanger, "The Robertson Family and Their Harps." There was a Clunie and Wester Clunie approximately 5 miles south of Lude (3 miles north of present day Pitlochry in Perth and Kinross), and a Cluniemor on the Lude barony.
[346] Charles Poyntz Stewart, ed., *Historic Memorials of the Stewarts of Forthergill Perthshire and Their Male Descendants* (Edinburgh & London: W & A. K. Johnston, 1879), 27 – 28.
[347] ibid. Faskally is situated across the river Tummel from Clunie.
[348] Sanger and Kinnaird, *Tree of Strings*, 214; Archibald Robertson Small, *Genealogy of the Robertson, Small, and Related Families* (Indianapolis: Albert Garret Small, 1907), 23. See also Sanger, "The Robertson Family and Their Harps."

interesting in her own right for having compiled a 260 page manuscript miscellany of 175 Scots and English poems and songs from the 16th and early 17th centuries.[349] This miscellany, originally dating from 1630, survives as a 19th-century copy at the National Library of Scotland (NLS MS 15937), and is examined in detail in the PhD dissertation of Verweij (2008).[350] Although the Robertson miscellany does not contain notated music, many of the song texts appear in other sources with music (for example several are in John Dowland's *The First Booke of Songes or Ayres)*, and as such it provides some insight into the musical world of the family that owned both the Lamont and Queen Mary harps.[351] Noting the research of Sanger and Kinnaird, Verweij (2008) makes the point that "musical activity appears continuously, not only in the household of Lude, but throughout the Atholl area."[352] He goes on to state that

> "Whereas it is difficult to assess the level of interaction between (Gaelic) folk culture and Scots or English music, still the two strands reinforce the idea that the Robertsons of Lude were a sophisticated and cultured family, and connected to the music of the Gaelic Highlands as strongly as to the latest love-lyrics (and perhaps even the music) from London."[353]

The Robertsons of Lude were apparently more than a family who happened to have a couple of harps; they were engaged in the musical world both in their immediate surroundings and farther afield. As Sanger and Kinnaird (1992) note, the Atholl area of present day Perth and Kinross, which includes Lude, was at a geographical and cultural crossroad between the Gaelic highlands and Scots lowlands, and enjoyed a rich and active musical scene, particularly with respect to the harp.[354] With these

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[349] David Stewart, *Sketches of the Highlanders*, vol. ii, Appendix xxix, quoted in C. P. Stewart, *Historic Memorials of the Stewarts of Forthergill Perthshire and Their Male Descendants* (Edinburgh & London: W & A. K. Johnston, 1879), 27.
[350] Sebastiaan Johan Verweij, "'The inlegebill scribbling of my imprompt pen': the production and circulation of literary miscellany manuscripts in Jacobean Scotland, c. 1580 – 1630" (PhD diss., University of Glasgow, 2008), 140 – 200. Accessed 28 July, 2014, http://theses.gla.ac.uk/329/1/2008_VerweijPhD.pdf. The author gratefully acknowledges Keith Sanger for bringing this dissertation to her attention.
[351] ibid., 184.
[352] ibid., 148.
[353] ibid., 148 – 49.
[354] Sanger and Kinnaird, *Tree of* Strings, 145 – 52.

facts in mind, it is not surprising that Margaret Robertson compiled a miscellany of the poetry and music that would have been very much a part of life in the Lude household. While it is only possible to speculate as to the identity of the Al Stewart whose name is inscribed on the Lamont harp, it is interesting to consider that it could have been her grandson.

The second item of written text on the Lamont soundbox was discovered inside it in 2010, during examination of the harp by the author. Its location in the soundbox is shown in figure 3.75. This item is a fragment of a document written on vellum. It consists of a rectangular piece, 7.5 x 33 cm in size, which has been glued to the inside of the soundbox to patch the crack that runs above the "AL Stewar[t] of CLunie ..." inscription described above. This crack and its repair with the vellum patch are mentioned in Loomis et al. (2012) and discussed in detail in Loomis (2010).[355] One corner of the vellum lies next to the lower right-hand soundhole, where there are scratches associated with string replacement, as described earlier. There are numerous such scratches on this corner of the vellum, indicating that it was placed in the harp during the working life of the instrument, and is not a later, post-historical addition.[356]

[355] "Structural Breaks and Repairs," 12 - 16; Loomis et al., "Lamont and Queen Mary Harps," 118.

[356] This corner has come away from the wood, and there are no visible scratches on the wood underneath it. This could either imply that the vellum patch is an early repair, or that the harp was being restrung through the string holes instead of the sound holes prior to the placement of the patch in the soundbox.

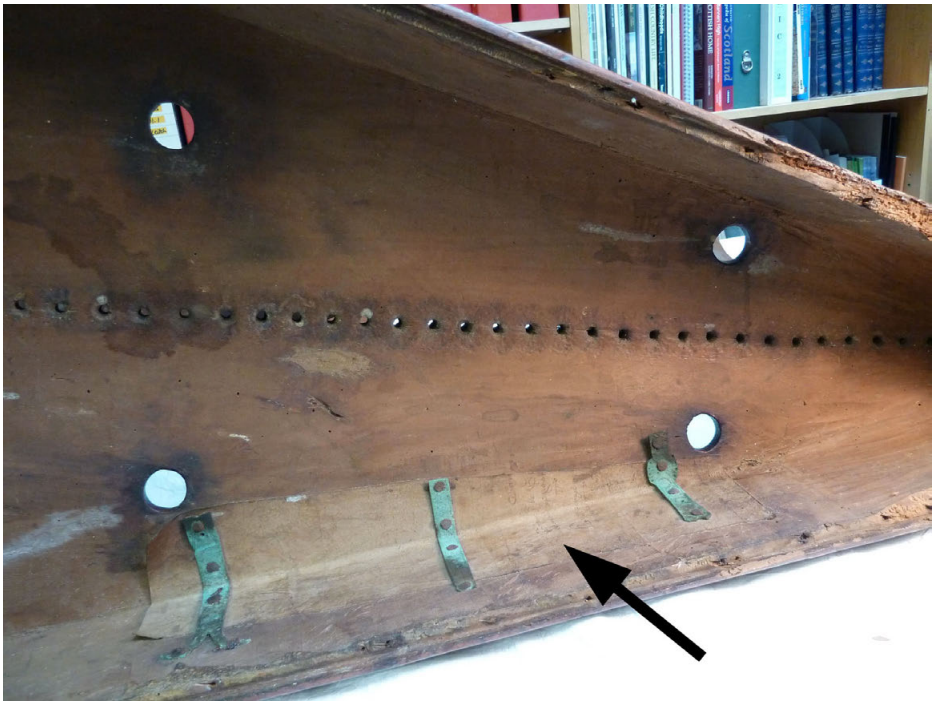

Figure 3.75: *fragment of a vellum document used to patch a crack in the soundbox of the Lamont harp. The vellum is glued to the soundbox interior, and has three copper alloy straps nailed over it. There is a fragment of writing on it in what appears to be a 17th-century hand. The location of the handwriting is indicated by the arrow.*[357]

Figure 3.76 shows the text on the document. It is written in what may be an early 17th-century hand, and appears to be the endorsement for a charter, which is presumably written on the other side of the vellum.[358]

[357] A version of this figure appears in Loomis, "Structural Breaks and Repairs," 16.
[358] David Caldwell and Keith Sanger, personal communication, July, 2010.

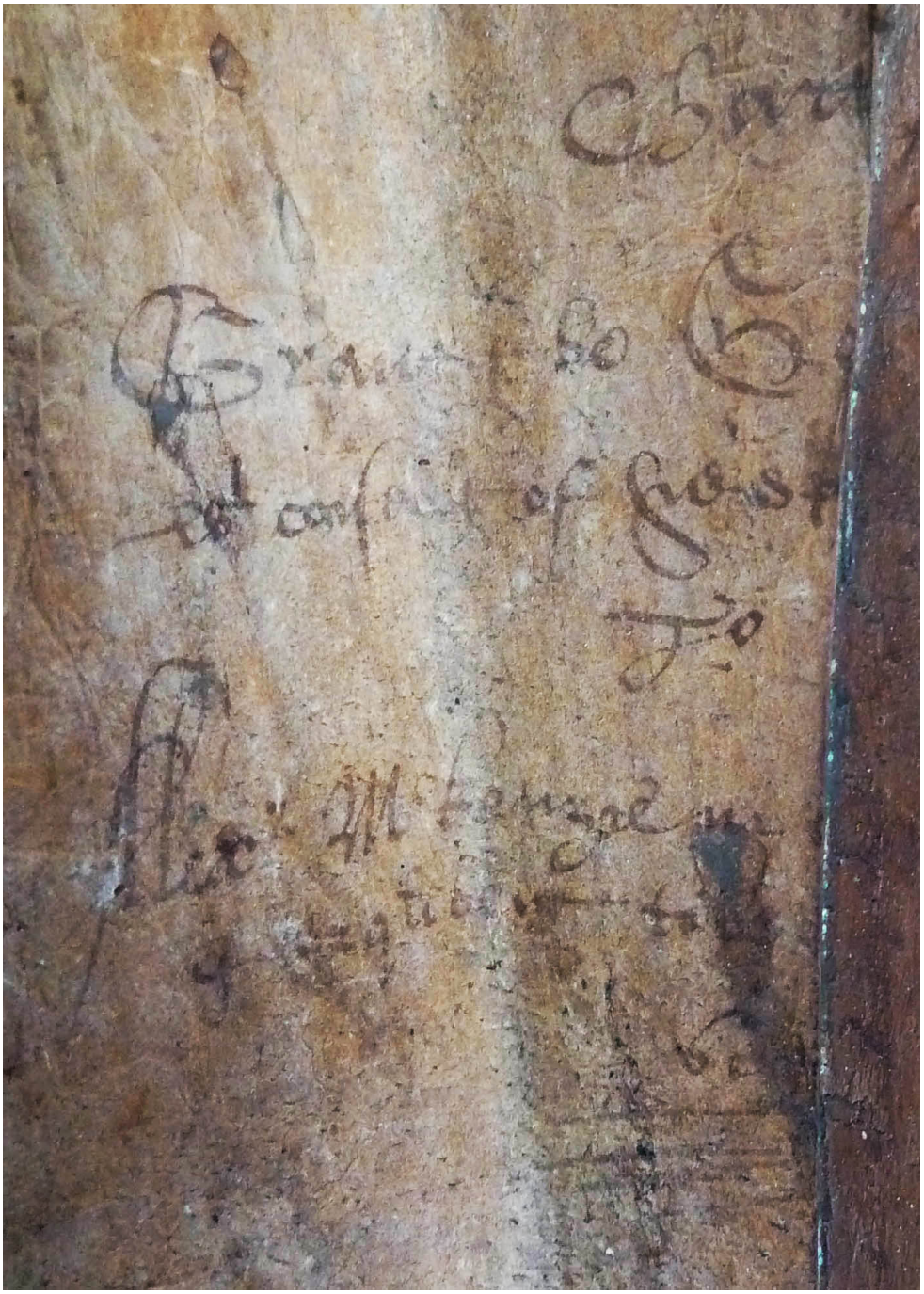

Figure 3.76: *fragment of text on a vellum document glued to the inside of the Lamont harp soundbox, as shown in figure 3.75. The contrast of this photograph has been enhanced to make the handwriting more visible.*

The text is only partially legible, and is cut-off on the right hand side. It reads as follows:

*Chart_*

*Grantit be Ge_*
Wt consent of his
*sp_*
To

Alex McKenzie in ...
at(?) urqll beg(?) t...
6...[359]

There is a cut-off letter at the edge of the document, after the word "in" following Alex McKenzie, so there was at least one additional word in this line. The line below the name is illegible, but may contain a place name. Keith Sanger has read this as *urqll beg* (or *wrqll beg*), possibly preceded by "at" or "of".[360] The final word in this line has not yet been deciphered. Since the discovery of this document, Sanger has undertaken extensive archival research in order to place it in context and therefore determine a lower limit for the date of the repair to the soundbox. What follows is a summary of the results of his research identifying and dating the document.[361]

Sanger has ascertained that this document may have been for a 'tack' (a lease of land) for Urchillbeg from George Stewart to Alexander McKenzie.[362] The area of Urchillbeg was within present day Orchill Mains, which lies along the River Garry mid-way between Blair Atholl and Killiecrankie, near the south-east border of the Lude estate. He also notes that, although tacks at this time were often verbal agreements, this one apparently required the consent of Stewart's spouse (presumably because she held the rights to the land), and therefore would have been less

[359] David Caldwell and Keith Sanger, July, 2010; Keith Sanger, e-mail message to author, 11 January, 2013. An earlier transcription of the text is appears in Loomis et al., "Lamont and Queen Mary Harps," 118.
[360] Sanger, 11 January, 2013.
[361] Keith Sanger, e-mail message to author, 6 June, 2014.
[362] George Stewart is not directly related to Alexander Stewart of Wester Clunie, but in light of their proximity in time and place they may have belonged to the same extended family.

straightforward and more likely to have been recorded. The date of this transaction has been narrowed down based on the style '***of*** Urchillbeg' adopted alternatively by George Stewart and Alexander McKenzie in other documents (the inference being that the person who styles himself as 'of' the location is in possession of the land at that time).[363] As the land would have reverted back to Stewart at the expiration of the tack, the dates during which McKenzie styles himself 'of Urchillbeg' indicate the years the tack was in effect. Based on other documents in which McKenzie and Stewart are named, this was sometime between 1617 and 1621.[364] This means that, if the document in the harp is the one upon which the transaction for Urchillbeg was recorded, it dates to no earlier than 1617, and ceased to be relevant no later than 1621, after the tack had expired.[365] The date 1621 is also significant as the year Alexander Tarlochson (alias Robertson) regained by purchase the family estate of Lude, which had been signed over to the Ogilvy family a century earlier.[366] Sanger notes that the years 1621 – 1623 were a time of intense activity establishing and improving the Robertson's newly re-acquired estate at Lude, and suggests that the repair of the harp could plausibly have been done at this time. The document would no longer have been of use, but may still have been close at hand if a person was looking for something suitable to use as a patch for a cracked soundbox.[367] George Stewart and Alexander McKenzie appear on other documents together with Alexander and John Tarlochson / Robertson, establishing their connection to the family that owned the Lamont harp.[368] Notably, in 1624, Alexander McKenzie is named as a member of the Barony Court assize for the estate of Lude, and in 1636 he is named as Baillie to Alexander Robertson of Lude.[369]

While the identity of the vellum document has not yet been confirmed, if it relates to the circa 1617 tack described above, it is likely that the vellum patch was put in the soundbox after 1621. As Sanger suggests this would most likely have occurred

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[363] Keith Sanger, e-mail message to author, 12 August, 2010.
[364] Sanger, e-mail message to author, 6 June, 2014.
[365] ibid.
[366] Sanger, "The Robertson Family and Their Harps."
[367] Keith Sanger, e-mail message to author, 6 April, 2014.
[368] Sanger, e-mail message to author, 12 August, 2010.
[369] ibid.

sometime in the years immediately following this date, when the document would have still been at hand, and Robertson would plausibly have had a motivation for repairing a harp, possibly an old one that had been handed down in the family, as a symbol of the family's newly reestablished status.[370]

In Loomis (2010), it was ascertained that the crack that was patched with this piece of vellum occurred when the belly of the harp rose under the tension of the strings.[371] This implies that the crack occurred when the soundbox was new, although it is also possible that a significant increase in string tension at a later date could have had the same effect. As discussed earlier, there is evidence that the string tension may have been increased at some point during its working life of this harp. Another possibility is that this is an older crack that had been repaired previously and required a second repair. David Caldwell's initial assessment of the metal straps nailed over the vellum is that the decorative work is consistent with 15th-century West Highland art.[372] They appear to have been repurposed from some other object, and Caldwell has speculated that they could have originally belonged to a casket similar to NMS H.UD 10, which dates to the late 15th – early 16th century.[373] Caldwell (1982) notes that caskets like this may have been common in the West Highlands in this time period, as they are depicted on a number of grave slabs in the region.[374] Figures 3.77 – 3.79 show the decorative work on the straps. If they date to an earlier repair, they would have been removed when the vellum patch was glued into the soundbox, and then nailed back over it.

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[370] Sanger, e-mail message to author, 6 June, 2014.
[371] Loomis, "Structural Breaks and Repairs," 12 – 16.
[372] David Caldwell, personal communication 15 July, 2010.
[373] For a photograph of NMS H.UD 10, see "Casket from Eglinton Castle, Ayrshire," National Museums Scotland, accessed 2 August, 2014, http://nms.scran.ac.uk/database/record.php?usi=000-100-002-043-C.
[374] David Caldwell, *Angels, Nobles, and Unicorns: Art and Patronage in Medieval Scotland* (Edinburgh: National Museum of Antiquities of Scotland, 1982), 58 – 59.

Figure 3.77: *copper alloy strap inside the Lamont harp soundbox. This strap is nailed over the vellum patch, at the bass end. The nail holes and cut-off end suggest the strap has been reused from elsewhere. Details of the decorative work are shown in the photographs on the right.*

Figure 3.78: *copper alloy strap inside the Lamont harp soundbox. This strap is nailed over the vellum patch at the treble end. As with the strap shown in figure 3.77, the nail hole and cut-off ends suggest it has been reused from elsewhere. Details of the decorative work are shown in the photograph on the right.*

Figure 3.79: *copper alloy strap inside the Lamont harp soundbox. This strap is nailed over the centre of the vellum patch. As with the straps shown in figures 3.77 and 3.78, the nail hole and cut-off end suggest it has been reused from elsewhere. Details of the decorative work are shown in the photograph on the right.*

Although the repair to the soundbox with the vellum document likely dates to sometime shortly after 1621, whether or not the soundbox also dates to this time period is still an open question. This is relevant to the interpretation of the third known item of written text on the Lamont harp soundbox, which is discussed below.

In December 2012, during examination of the interior of the Lamont harp under extreme raking light, a date was discovered inscribed into the wood. This date appears to read: AD 1451. It is shown in figures 3.80 and 3.81, below. Figure 3.82 shows the letter "A" photographed under different lighting to reveal more detail. The date appears to have been tapped into the wood with the flat end of a chisel.[375] Figure

[375] The author gratefully acknowledges Keith Sanger for suggesting that the inscription appears to have been tapped into the wood with the flat end of this tool.

3.83 shows the location of the inscription in the soundbox. It is lightly inscribed and nearly invisible, except under optimal lighting.

Figure 3.80: *a date inscribed inside the Lamont harp soundbox. The date reads AD 1451. The inscription is in the wood, directly above the vellum document (visible along the lower edge of the photograph).*

Figure 3.81: *the inscribed date shown in figure 3.80, under different lighting. Photograph: Isabell Wagner. Scale added by the author.*

Figure 3.82: *detail of the inscription, photographed under lighting to highlight the crossbar in the letter "A".*

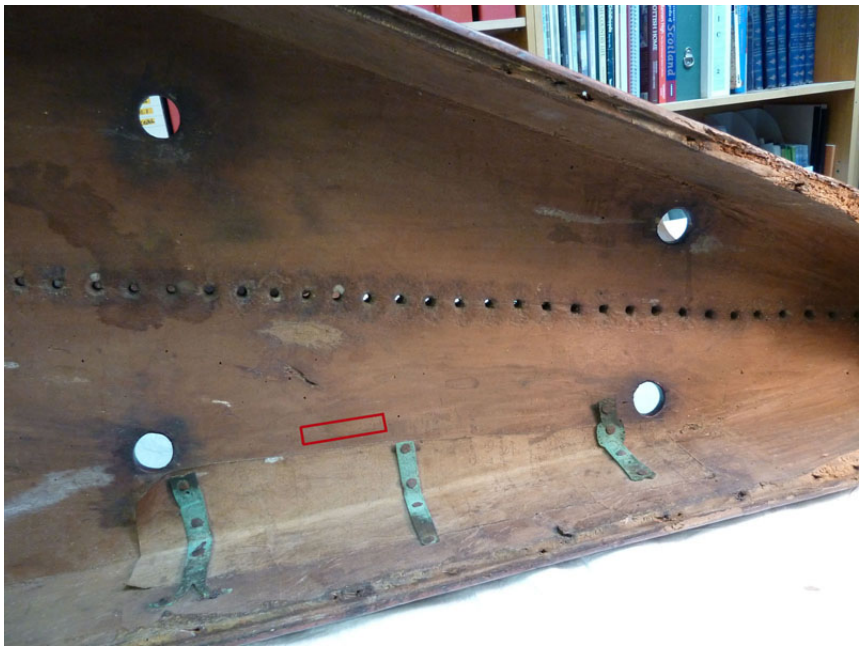

Figure 3.83: *the location of the inscribed date in the Lamont harp soundbox (red box).*

The foremost question pertaining to this date is whether it was inscribed in the soundbox in 1451, or placed there later.[376] The style of the letters and numbers can be

[376] There is evidence that at least some musical instruments were inscribed with a date (and makers name) as early as the 14th and 15th centuries, for example the 1361 Nicholas Faber organ at Halberstadt, and the 1370 Verner organ from Sundre, Gotland. See, Praetorius, *Syntagma musicum, Vol. II*, 98; and Bertil Wester, *Gotisk Resning, I: Svenska Orglar*

examined to determine if it is consistent with the mid 15th century in Scotland. For this, the author is again indebted to the research of Keith Sanger. Figures 3.84 and 3.85 show the dates from the endorsements for two mid 15th century Scottish charters that bracket the date in the Lamont harp soundbox. These are National Records of Scotland GD 132 / 2 and GD 132 / 4.[377]

Figure 3.84: *dates inscribed on the endorsement to a charter dated 1448. Each side of the outside of the folded charter is inscribed by a different scribe, as is customary (one inscription is the endorsement proper, and the other is an identifier for record keeping). NRS GD 132 / 2 (detail).*

(Stockholm: Generalstabens Litographiska Anstalts Förlag, 1936), 172. A mid 15th-century gittern at Wartburg, Eisenach has a label on the inside of the body with the maker's name. See Herbert Heyde, *Musikinstrumentenbau: 15.–19. Jahrhundert: Kunst, Handwerk, Entwerf* (Leipzig: Deutscher Verlag für Musik, 1986), plate 18. The author gratefully acknowledges John Koster for providing these examples.

[377] The author gratefully acknowledges the National Records of Scotland and Keith Sanger for providing the scans of both charter endorsements, from which these and subsequent figures are derived.

Figure 3.85: *dates inscribed on the endorsement to a charter dated 1452. As for the 1448 charter, each side of the outside is inscribed by a different scribe. NRS GD 132 / 4 (detail).*

The style of the numerals in figures 3.84 and 3.85 can be compared to those of the Lamont inscription in figures 3.80 and 3.81. Note, however, that the dates in the lower inscriptions in figures 3.84 and 3.85 appear to be in a later hand, so are likely not contemporary with the date on the document.

The date in the Lamont harp soundbox is inscribed in Arabic numerals, and Arabic numerals are also used on the two charters. The numeral "4" in the Lamont harp inscription is closed. Two of the charter dates also have a closed numeral "4" (notably, the two that do not appear to be of a later style of handwriting). The shape of the numeral "5" in the Lamont harp inscription is consistent with the "5" in the 1452 charter, and with the "5" in "25" on the same charter, for both styles of handwriting. The upstroke for the numeral "1" is more pronounced in the Lamont inscription than it is on either of the charters, although it is present on both.

If the endorsements on these charters are contemporary (excluding the two that appear not to be), this comparison suggests that the numerals in the soundbox inscription are at least consistent with the form of numerals found in mid 15th-century Scottish handwriting. It does not exclude the possibility that the date could

have been added later, though, as the style of numerals used is not unique to one time period.

It is curious that this inscription was placed inside the soundbox where it would not normally be visible, not even through the sound holes. A possible scenario is that it was placed there at a much later date with the intention of being "discovered" in order to make the harp appear older than it actually is. The most likely circumstance for which there would have been a motive for doing so would have been when the harp was put up for auction in 1904.[378] The auction catalogue describes the harp as dating "probably from the 11th or 12 Century," however, which does not agree with the date inscribed, so it is unlikely that the date was put there for the auction, or that Dowell, the appraiser and auctioneer, was aware it was there.[379] Furthermore, the harp had been continuously on display at the National Museum of Antiquities from 1880 up to the time of the auction, so it is unlikely there would have been an opportunity to add an inscription to the interior of the soundbox.[380] Another opportunity for placing a spurious or retrospective date inside the soundbox could have presented itself when the harp was examined by Gunn, and later Bell, for the Society of Antiquaries. Neither Gunn nor Bell mentions the presence of this date, or of the vellum document also inside the soundbox.[381] As both of these items would have been notable, it is unlikely either was aware of their presence, which suggests that neither had the soundbox open. From the death of John Robertson in 1731 until the harp went on display at the Museum of Antiquities in 1880, the harp appears to otherwise have spent much of its time in storage, either at Lude or, later, at Dalguise.[382] When the harp was still in use, the interior of the soundbox would not have been easily accessible, unless the harp strings were un-tensioned. The last person who could have inscribed this date was Moir Bryce, the antiquarian who

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[378] Sanger, "The Robertson Family and Their Harps."
[379] NMS archive H.LT 1 & 2, *Valuable Antique Furniture: Stuart and Jacobite Collection ...* (Edinburgh: Dowell's, 12 & 14 March, 1904), 10. Sanger notes that the harp was appraised by Alex Dowell upon the death of Steuart in 1903. See Sanger, "The Robertson family and Their Harps."
[380] ibid.
[381] Gunn, *Historical Enquiry*. Charles Bell, "Notice of Two Ancient Harps and Targets," 10 – 16.
[382] Sanger, "The Robertson Family and Their Harps."

purchased the Lamont harp at auction and later bequeathed it to the National Museum of Antiquities of Scotland. He had the harp in his possession until his death, so would have had ample opportunity.

There is evidence that favours an earlier, rather than later, date for the inscription. One point to consider is its location. Inscribing (or tapping in this case) onto the inside of the front of the soundbox with a chisel would be considerably easier with the soundbox lying face down, however with the harp assembled the soundbox can only lie on its side or its back.[383] With the soundbox on its side, which is how the harp would rest with the soundbox open, the natural place to put an interior inscription would be on the side not the front. It is therefore more likely that the date was inscribed when the harp was disassembled.[384] This could have taken place during the repair of the neck, which may have also been when the crack was patched with the vellum document. That would plausibly date the inscription to no earlier than 1621, based on the assessment of the date of that document. The inscription is located just above the vellum document, so it is possible they are associated with each other.

An important piece of evidence stemming from the vellum document is the glue that was used to affix it to the soundbox. A layer of glue was spread onto the area of wood to be patched, and the vellum (probably with glue also applied to it) was placed on top. This is evident from the layer of glue on the wood around the edges of the vellum. Some of this can be seen in figure 3.86, which also shows the inscribed date. The lighting is different from the previous photographs of the inscription, so the glue is more visible. It is evident from this photograph that the layer of glue overlies the inscription. It also appears that the glue has pooled into the inscription in places, for example in the final numeral "1". This would mean that the inscription was already there when the vellum patch was glued into the soundbox. Based on the assessment of the date of the vellum document, it is unlikely, therefore, that the inscription was made any later than the early to mid 17th century, which would rule

[383] Keith Sanger, email to author, 22 January, 2013.
[384] ibid.

out any possibility that it is a post-historical addition to the harp. It could have been done at the time of the repair with the vellum, but why make an inscription in the wood only to carelessly smear glue over it while completing the repairs? It is worth stressing that in the absence of appropriate lighting the inscription is essentially invisible, so whoever glued the vellum into the soundbox may not have been aware it was there. It is therefore probable that the inscription is unrelated to the repair with the vellum, and that it predates it by an as yet unknown amount of time.

Figure 3.86: *excess glue on the wood beyond the edge of the vellum patch in the Lamont soundbox. The glue overlies part of the 1451 date inscribed into the soundbox (arrowed). The edge of the vellum document is visible at the bottom of the photograph.*

Another question with regard to this inscription is the choice of 1451 for the date. Sanger proposes a speculative scenario that may provide some significance for it. The two charters whose dates are shown above relate, as it happens, to the barony of Lude, and it is possible they may be relevant to the 1451 date inscribed in the harp.[385] The 1448 document is a crown charter for Lude, granted to John Donaldson (a forebear of the Robertsons of Lude), and the 1452 document is a new charter, also

[385] Keith Sanger, private communication, 17 January, 2013. E-mail to author 29 June, 2014. See also Sanger, "The Robertson Family and Their Harps."

granted to John Donaldson, elevating Lude to a barony.[386] The endorsements for these two charters are shown in full in figures 3.87 and 3.88.

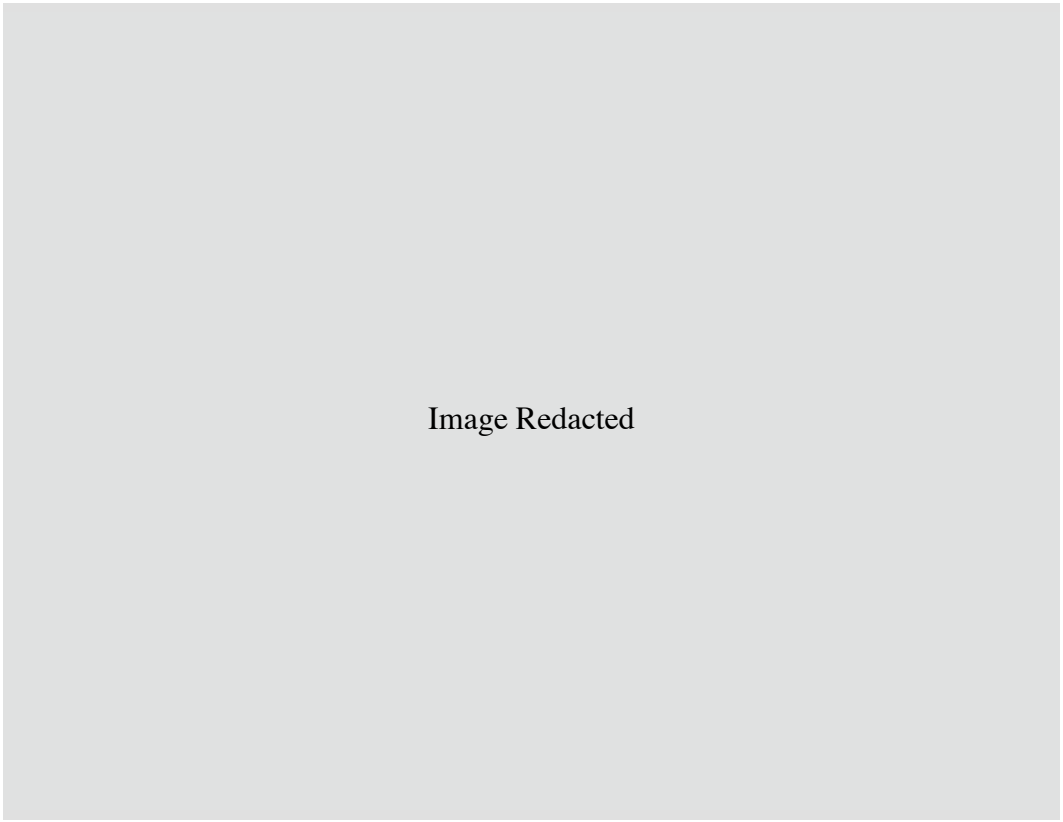

Figure 3.87: *endorsements on a crown charter for Lude, granted to John Donaldson in 1448 (NRS GD 132 / 2). Scan: National Records of Scotland.*[387]

[386] ibid.
[387] Provided to the author by Keith Sanger. National Records of Scotland, "Crown charter for Lude, 1448." NRS GD 132 / 2.

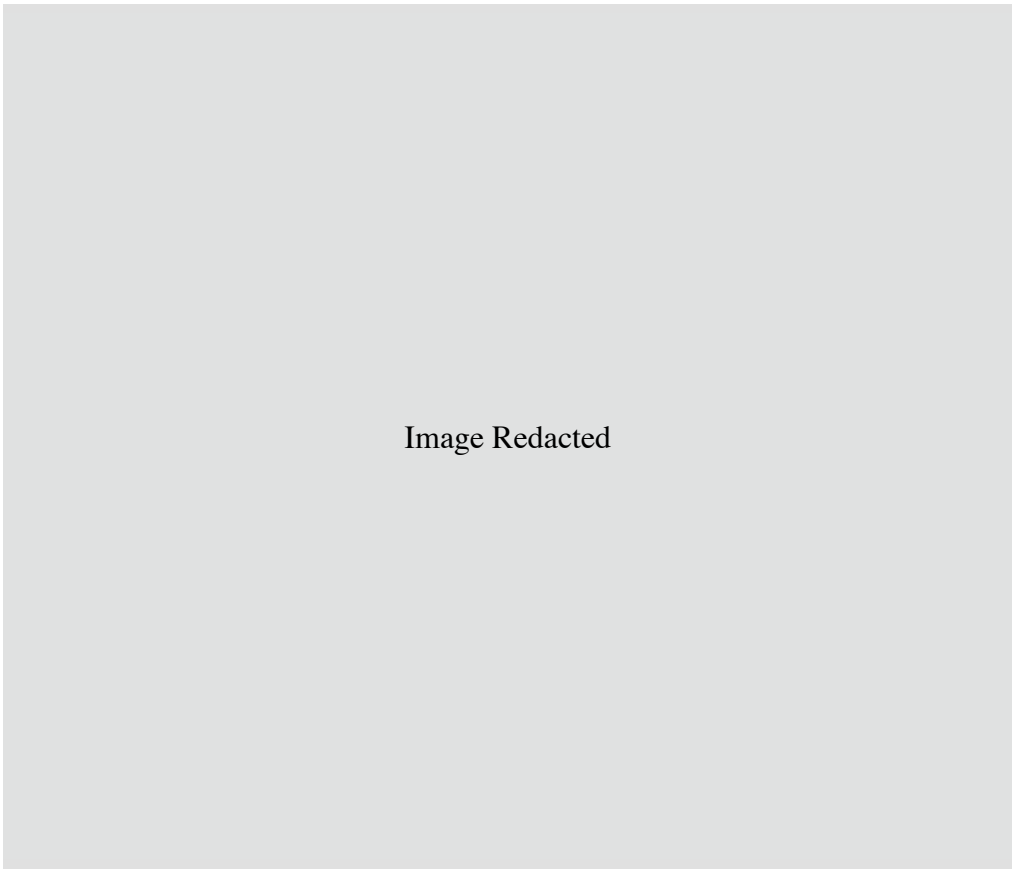

Figure 3.88: *endorsements on a charter establishing the barony of Lude, granted to John Donaldson in 1452 (NRS GD 132 / 4). Scan: National Records of Scotland.*[388]

Sanger has noted that the barony of Lude apparently did not include the nearby land of Clunes (a.k.a. Clunie).[389] The younger of John Donaldson's two sons is identified as Charles (or Tarloch) of Clunes, which may imply he was given Clunie, whereas the elder son, Donald Johnson, was given the inheritance of Lude.[390] It is the 'Charles of Clunes' branch of the Lude family from which the later Robertsons of Lude (who had the two harps) are descended.[391]

[388] Provided to the author by Keith Sanger. National Records of Scotland, "Charter establishing the barony of Lude, 1452." NRS GD 132 / 4.
[389] Keith Sanger, e-mail to author 29 June, 2014.
[390] Sanger, "The Robertson Family and Their Harps."
[391] ibid.

Bell (1880) notes that Burke's Landed Gentry names Lilias Lamont as having married Charles, "fifth laird of Lude," bringing with her the Lamont harp.[392] Although he was never actually a laird of Lude himself, this Charles is the same person as Charles of Clunes, the younger son of John Donaldson of Lude.[393] Even though there is currently no known contemporary written record of the harp being brought from Lamont to Lude (or Clunie), it is notable that at this time members of the hereditary family of harpers to the Lamonts, the 'McEwins', first appear in the areas of Lude and Clunie in association with Charles of Clunes.[394]

With regard to the 1451 date, Sanger notes that this is the year John Lamont, the brother of Lilias, reached the age of legal majority and attained the lairdship of Lamont after having been a ward of the crown.[395] Sanger speculates that Lilias could have been married off soon after her brother became the laird, with the harp possibly forming part of her dowry.[396] If so, that would give significance to the 1451 date in the harp (although this a bit earlier than the circa 1460 date noted by Gunn).[397] It would also provide a reason for the exclusion of Clunie from the barony of Lude that was established in 1452, as it would plausibly have gone to Charles and his wife Lilias, while the elder son, Donald, inherited Lude.[398]

What is most curious about this inscription is its location inside the soundbox where it would not normally be visible, as mentioned earlier. It does not appear to have been intended for public viewing. In light of the possible connection of the 1451 date to the marriage of Lilias Lamont to Charles of Clunes described above, it could conceivably have been inscribed privately by the builder to mark when the harp was

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[392] Bell, "Notice of Two Ancient Harps and Targets," 28. See also Sanger and Kinnaird, *Tree of Strings*, 72; and Keith Sanger, "The 'Lamont' Harp." Sanger has pointed out that the information quoted by Bell is incorrect in that Charles was never a laird of Lude. Keith Sanger, e-mail to author, 22 August, 2014.
[393] Sanger, "The Robertson Family and Their Harps."
[394] Sanger, "The 'Lamont' Harp."
[395] Keith Sanger, private communication, 17 January, 2013; e-mail to author, 29 June, 2014. See also Keith Sanger, "The 'Lamont' Harp."
[396] Keith Sanger, e-mail to author, 29 June, 2014.
[397] Gunn, *Historical Enquiry,* 73. Gunn gives the date of her arrival at Lude as "about the year 1460." Bell gives the date as 1464. Bell, "Notice of Two Ancient Harps and Targets," 15.
[398] Sanger, e-mail to author, 29 June, 2014.

made (as opposed to explicitly commemorating the marriage of Lilias, or the elevation of John Lamont to laird). The soundbox could have been made at the time John Lamont became laird, and the harp given as part of the dowry of Lilias at a later date.

To summarize, although the date of this inscription is unconfirmed, the evidence suggests that it was made when the harp was disassembled, and that it predates the placement of the vellum document in the soundbox. This, and the concurrence of this date with events at Lamont and Lude, suggests the possibility that the date may be authentic. Its placement out of view in a normally inaccessible location suggests it was not intended for public viewing, and that it was placed there by the person most likely to have had access to the disassembled harp at this time, which would have been the builder.[399] It is, therefore, plausible that AD 1451 represents the date of construction of the Lamont harp.

Wear marks

The topics discussed thus far point to a long working life for the soundbox of the Lamont harp. The wear marks along the edges of the soundbox are also suggestive of long use. This section focuses on the location of the wear, as this information has a direct bearing on performance practice for this instrument.

Historically, the Irish harp was played resting on the left shoulder with the left hand playing the treble strings and the right hand the bass strings.[400] This was observed first-hand by Edward Bunting in the late 18th century, and is also apparent from the wear marks on the surviving instruments.[401] The harpist Mary Rowland observed the wear marks on the soundbox of the Trinity College harp when she played it for the

[399] Although there is no name with the date, given its location there is the possibility that some of the inscription may be hidden behind the vellum.
[400] Bunting, *Ancient Music of Ireland*, 24, note a. Armstrong, *Irish and Highland Harps*, 36. Rimmer, *Irish Harp*, 2.
[401] ibid.

BBC in 1961.[402] An extract of her report on playing this harp contains the following statement:

> "The first time this harp was handled by me it became immediately apparent that the deep wear marks on the soundbox gave absolute indication as to the way it was held, i.e. on the left shoulder, with the left hand playing the treble strings and the right hand the bass. This is the reverse order to all modern harps, which are placed on the right shoulder, with the right hand playing above the left as a general rule, though both hands can be used at will anywhere within the compass of a modern harp. This is not so with the Trinity College harp, for the depth of the wear marks also indicated that the harp had been held in position on its keel by the arms or wrists while playing, thus giving each hand only a limited range of action."[403]

A photograph of Rowland taken at the time she made these observations shows her holding the Trinity College harp with her arms positioned in the wear marks. This photograph is reproduced in figure 3.89.

[402] Mary Rowland, "Report on Playing the Trinity College, Dublin, Harp," 14 October, 1961, in British Museum conservation report, "15th c. Irish harp formerly known as the Brian Boru harp & now known as the TCD harp," PR02231.
[403] ibid.

Figure 3.89: *harpist Mary Rowland holding the Trinity College harp with her wrists resting on the wear marks.*[404]

The soundbox of the Lamont harp has wear marks similar to those on the Trinity College harp. These are shown in the photographs in figure 3.90.

[404] British Museum, conservation report, "TCD harp." Photograph © The British Museum, used with the permission of The British Museum and The Board of Trinity College, Dublin.

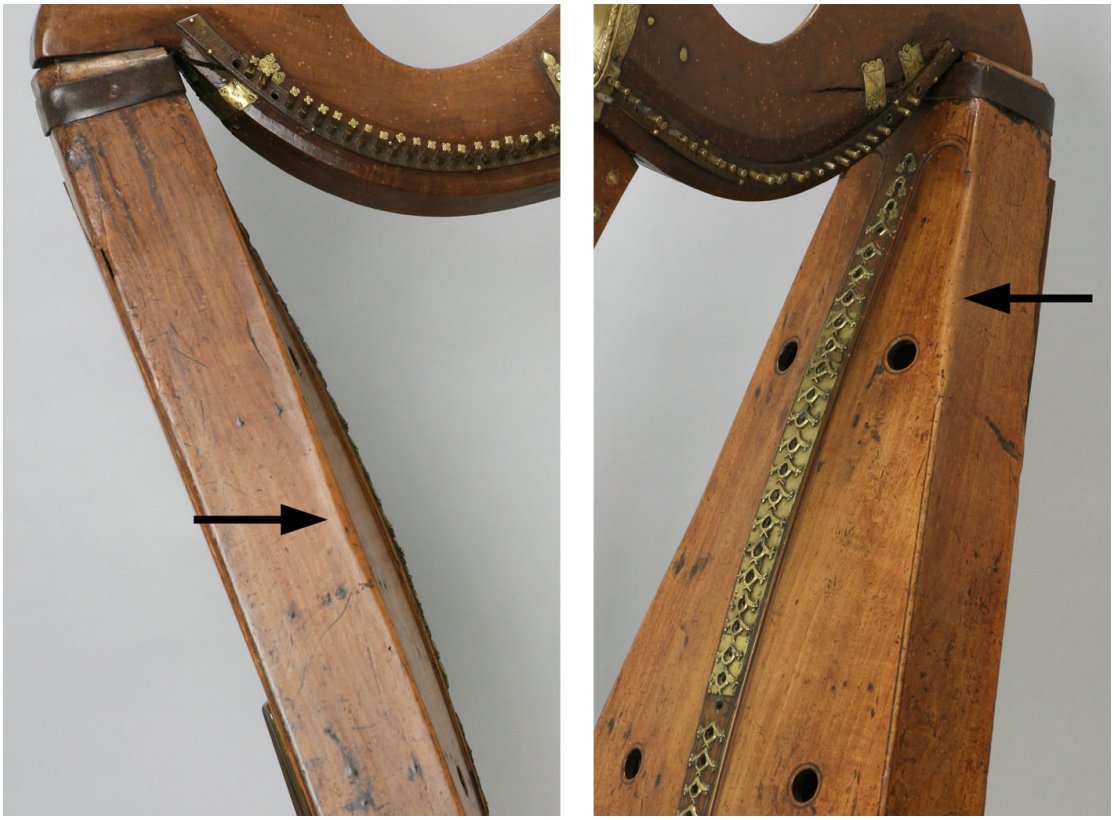

Figure 3.90: *wear marks on the edges of the Lamont harp soundbox (arrowed). The wear is the result of the player's wrist and forearm contacting the edge of the box as illustrated by Mary Rowland in figure 3.89.*

There is a single very well defined worn area along the edge of each side of the Lamont harp soundbox. This is illustrated in figure 3.91. The red lines in this figure indicate the extent of visible wear along each edge of the soundbox, and the arrows indicate the location of maximum wear. Present day musicians playing harps modeled after the Lamont may wish to take the position of these wear marks into consideration when interpreting historical repertory and performance practice. If the position of the wrist or forearm is different to what has been observed on the original instrument, then there is something different in the manner in which the instrument is being held and played.

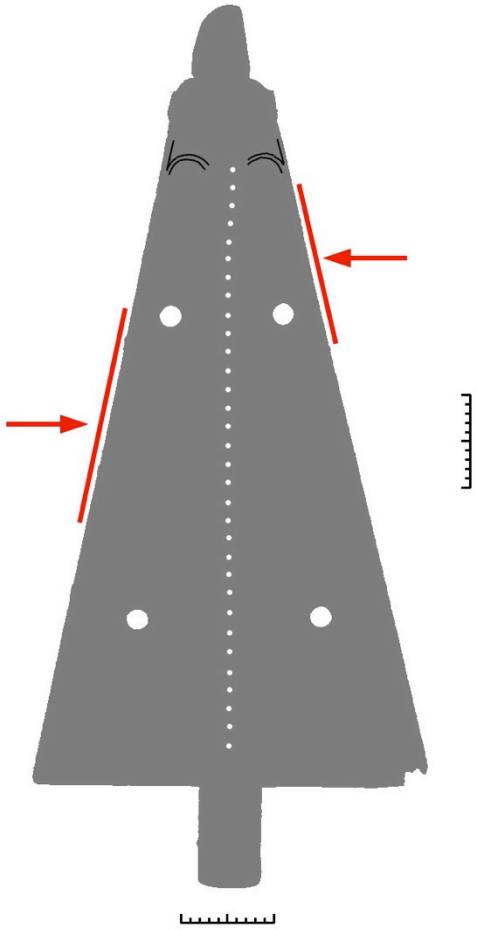

Figure 3.91: *illustration of the location of wear on the edges of the Lamont harp soundbox. The red lines indicate the extent of the visible wear, and the arrows indicate the location of maximum wear. Scale 1 tick : 1 cm.*

Soundboard thickness[405]

The soundboard is arguably one of the most important acoustical elements of any stringed instrument, however, prior to the current study, there existed only very limited information on the soundboard thickness for any of the surviving Irish harps.[406] The few measurements that were available had only been taken at the sound

[405] This discussion is adapted from Loomis et al., "Lamont and Queen Mary Harps,"126 – 28.
[406] For Irish harps, the front face of the carved out soundbox acts as the 'soundboard'. So, although it is not a separate board, for the purpose of this discussion, it is referred to here simply as the 'soundboard'.

holes. Armstrong's published measurements for the Lamont harp soundboard thickness are 3/8-inch (10 mm) at both the upper and lower sound holes.[407] A data sheet in the National Museums Scotland archives gives 11/32 – 3/8 inch (9 – 10 mm) for the thickness at the sound holes, essentially the same measurements.[408] With the data from the CT scans, it was possible to measure the entire soundboard of both the Lamont and the Queen Mary harps, and generate a complete contour map of the thickness.

To obtain these measurements, cross-sections of the soundbox were taken from one of the CT scans and the soundboard thickness was measured at several locations on each. The thickness at each location was determined from the FWHM of the cross-sectional profile, normal to the surface. The resolution of these measurements is 0.5 mm. A 3 cm × 3 cm sampling grid was used, with additional measurements along the edges of the soundbox and in areas of abrupt change in thickness (for example at the edge of the string band). Due to image artefacts associated with the metal string shoes, it was only possible to take a limited number of measurements on the string band. The mapping of the soundboard thickness in this location is therefore much less reliable. There was also the issue of the piece of vellum glued to the right hand edge of the interior of the soundbox, which added to the thickness.[409] The vellum and layer of glue measure approximately 0.5 mm thick and measurements taken through the vellum have been adjusted by this amount.

The resulting contour map of the Lamont harp soundboard thickness is presented in figure 3.92.[410] Each contour represents a change in thickness of 0.5 mm. The coordinate system is that of the CT scanner, with the exception that the scanner's z-axis is referred to on the contour map as the y-axis. For reference, the positions of the string holes and sound holes were measured and added manually.

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[407] Armstrong, *Irish and Highland Harps*, 61, and 168 – 69.
[408] Data sheet, "Harp Measurements" (H. LT2 archive, National Museums of Scotland, undated).
[409] The vellum extends from the upper sound hole to just below the lower soundhole. It is affixed at an angle to the edge of the box and covers 2 cm to 5 cm of the front surface from the right-hand edge of the soundbox, starting from the upper sound hole.
[410] The contour maps were generated using the Aabel v. 3.0.5 graphing programme. A version of this figure appears in Loomis et al., "Lamont and Queen Mary Harps," 167.

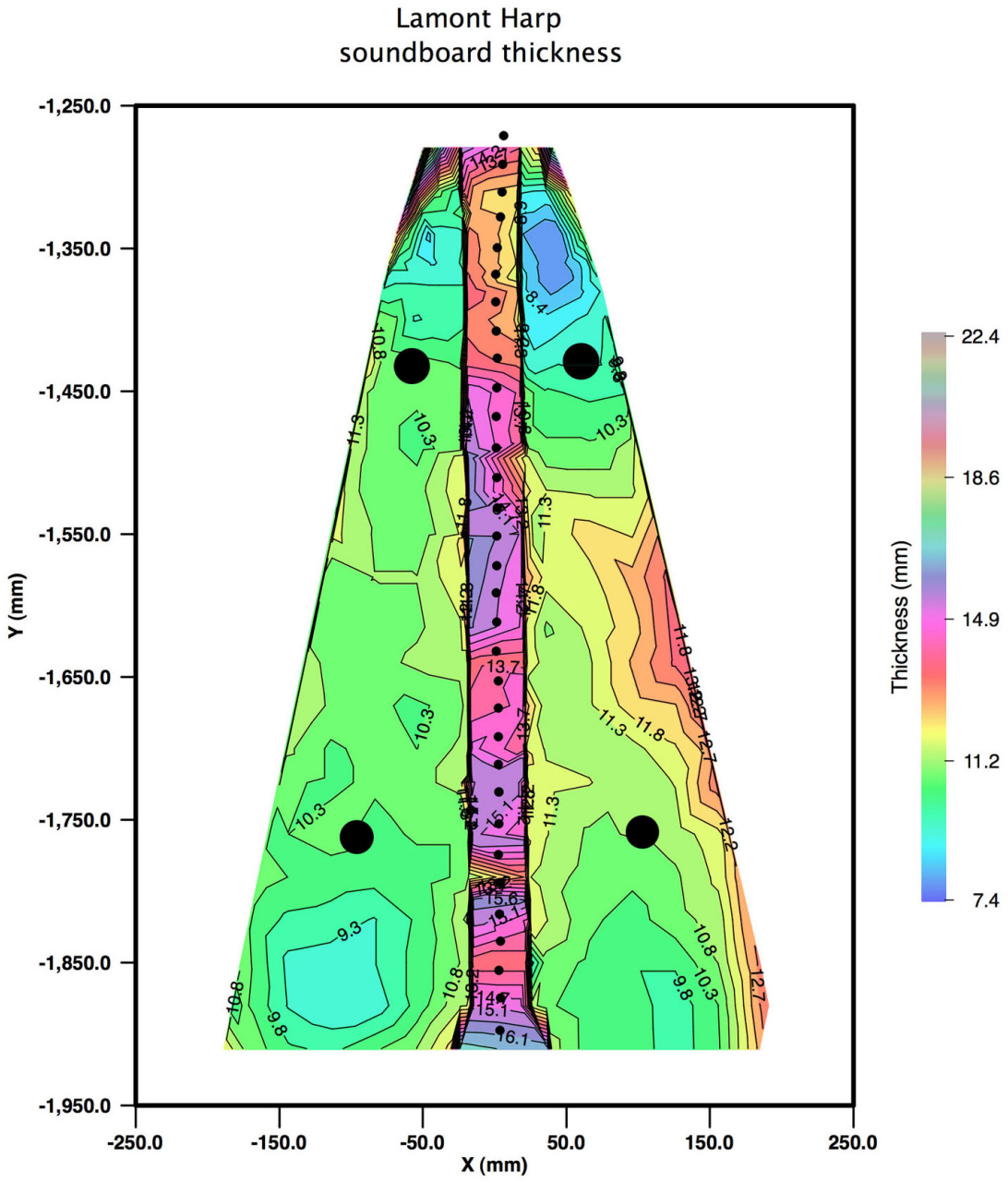


Figure 3.92: *contour map of the Lamont harp soundboard. The treble end of the soundbox is at the top of the figure. Thickness increases towards the red end of the colour spectrum (with the exception of the thickest contours on the string band, which wrap back to the blue). Each contour represents a change in thickness of 0.5 mm. The colours used in this map represent the same thicknesses in the contour map of the Queen Mary harp soundboard (figure 4.98).*

The contour map of the soundboard thickness shows that the Lamont harp soundboard is roughly 10 – 11 mm thick near the sound holes, in agreement with Armstrong's measurements quoted above. Importantly, it has revealed that the soundboard is not of uniform thickness. It is thinner in the treble, decreasing from approximately 10 mm at the upper sound holes to around 8.5 mm on the right-hand side of the harp and 8 mm on the left-hand side (this area of the soundboard also appears to be thinner overall on the left-hand side). This represents a change in thickness of 15 – 20%. Some of this may be due to later thinning of the interior of the soundbox, as suggested by the tool marks shown in figure 3.70, although these are primarily confined to the sides of the box, so some of the observed difference in thickness is likely to be original to the construction of the soundbox. Interestingly, the midsection of the soundboard is thicker on the left-hand side of the harp, where the thickness increases by about 20%, from 11 mm to 13.5 mm towards the left-hand edge. At the bass end of the soundbox, there are also two areas, symmetrically located on either side of the string band, where the thickness decreases by about 1mm, from 10.5 mm to 9.5 mm. This represents a change of roughly 10%.

These contours may have resulted from a combination of the practicalities of working the wood, the need for mechanical stability of the box, and some intentional tuning of the soundbox. They may, however, simply be unintentional variations left by the builder. As will be seen in the next chapter, there are similarities with the pattern of thickness variations observed in the contour map of the Queen Mary harp soundboard, which suggests that the contouring may have been intentional. The thinner treble, in particular, reduces the stiffness where the soundbox is narrow, enabling it to vibrate more easily. This would have an effect on the quality of tone of the treble strings, and it is a standard feature of the soundboards of modern harps to have the thickness taper from bass to treble for this reason.[411] It is therefore plausible that the soundboard was intentionally made thinner in the treble. Possible reasons for the left-right asymmetry in the middle are less obvious. The acoustical and mechanical effects should be examined, though, as they could prove to be interesting.

[411] Chris Waltham, and Andrzej Kotlicki, "Vibrational Characteristics of Harp Soundboards", *Journal of the Acoustical Society of America* 124 (2008), 1775.

The two slightly thinner areas of the soundboard located either side of the string band near the bass end are also interesting. Based on examination of the soundbox interior, this does not appear to be a later modification. The difference in thickness is however quite small, so this may simply be an unintended consequence of the way in which the wood was worked.

Decorative work

The decorative work on the soundbox consists of a pair of lines following the edge of the string band around the eyebrows, and a single line down the sides of the box and around the sound holes. Armstrong describes these lines as "apparently burned in by a hot iron."[412] These decorative lines are not discussed further here except to note that upon visual inspection it was not possible to tell conclusively if they were burned in, although their appearance is consistent with this method. They are shown in detail in figure 3.93, below.

[412] Armstrong, *Irish and Highland Harps*, 161 – 62.

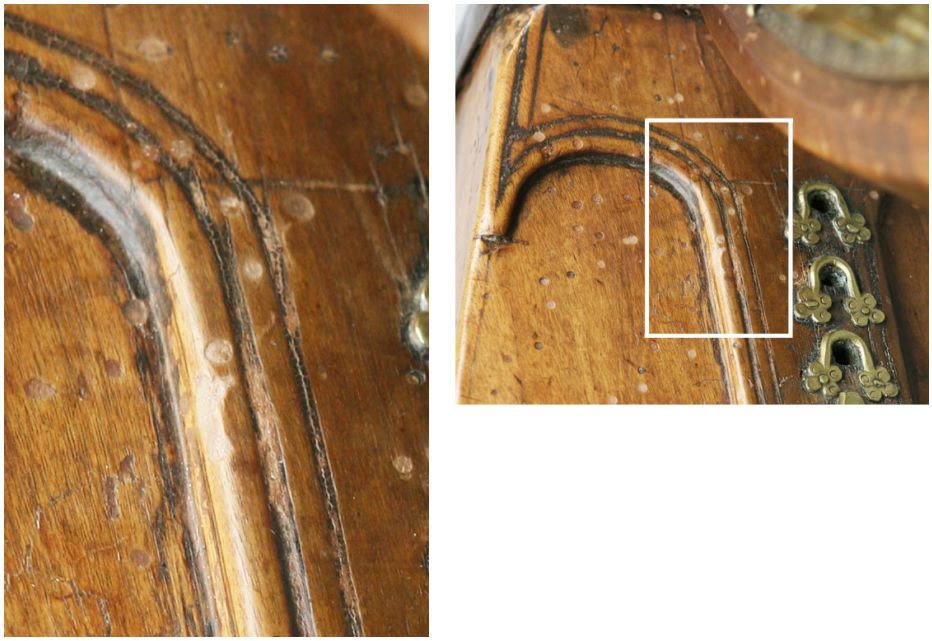


Figure 3.93: *decorative lines on the Lamont harp soundbox. The area inside the rectangle in the photograph on the right is shown enlarged on the left. Photograph: Maripat Goodwin.*

Summary

In terms of construction, the examination of the soundbox of the Lamont harp has shown that it incorporates some features that are particularly advantageous to the acoustics of the instrument and the structure of the frame. The profiled 'soundboard' (the front face of the soundbox) compensates for the increased stiffness at the narrower treble end of the box by being thinner at that end, and the through mortise at the joint with the neck (discussed in Chapter 2) allows for additional flexibility that has a structural as well as an acoustical advantage. The alignment of this through mortise parallel to the long axis of the soundbox does, however, make this joint and the back of the soundbox susceptible to damage by the neck tenon.

The size of the string holes is an interesting and notable feature in that they are large in comparison to the string holes on the later, high-headed harps. This is also true for the string holes on the Queen Mary and Trinity College harps, and it is possible that these earlier harps were originally designed to be restrung by inserting a relatively

narrow (metal) toggle directly into the string hole rather than restringing via the sound holes.

The soundbox of the Lamont harp shows signs of having had a long working life. This is evident in the wear on the metal string shoes, the number of toggle marks around the string holes, and the number of scratches left by restringing through the sound holes. Since the end of the working life of this harp is understood to coincide with the death of John Robertson of Lude in 1731, the wear and the quantity of restringing marks suggests an early date for its construction, possibly as early as the late 15th century.

The soundbox also shows evidence of damage and repair, much of which has been discussed in the author's master's thesis on the structural breaks and repairs to the Queen Mary and Lamont harps. Examination of the vellum document associated with the repair to the crack in the soundbox side has shown that this repair was made during the working life of the harp. Research conducted by Keith Sanger on the handwritten text on this document has led to a likely identification and dating of it that points to a date of repair sometime in the second quarter of the 17th century. The metal straps nailed over this document may be of a much earlier, 15th-century design, however, as suggested by David Caldwell.

Perhaps most significantly, the soundbox has the date AD 1451 inscribed in it. While it is not yet known if this inscription genuinely dates to the mid 15th century, it has been established that it predates the placement of the vellum document in the soundbox. Research conducted by Keith Sanger has shown that the style of the numerals is at least consistent with written numerals for Scotland in the mid 15th century, and that the date itself may be relevant to events taking place within the Lamont and Lude estates. When considered along with the age of the soundbox estimated from the restringing evidence, there is now a reasonably compelling case for AD 1451 being the date of construction of the Lamont harp soundbox.

Cross-sections

The dimensions of the soundbox in its current state are shown in the tomographic cross-sections below. The tomogram in figure 3.94 is a cross-section through the middle of the soundbox. The lines labeled A – E indicate the locations of the vertical cross-sections shown in figures 3.95 – 3.99. For all of these figures, the grey-scaling has been set to accurately represent the location of the physical edge of the wood. The dimensions given are derived from the FWHM of the cross-section. In figures 3.95 – 3.99, the lines in the two left-hand images indicate the location of the cross-section shown on the right, and the measurements shown were taken at the location of the lines indicated on the cross-section. The right-hand side of the harp is on the left, and the view is from the perspective of 'looking up' the soundbox from the bass end. Figure 3.100 is a tomogram of the front of the soundbox, showing the positions of the string and sound holes.

Figure 3.94 (overleaf): *tomographic cross-section of the soundbox of the Lamont harp. This cross-section also shows the neck tenon in the soundbox mortis at the treble end of the box. Note that this joint is offset towards the right-hand side of the soundbox. The outline of the mortise for the forepillar is visible in the projecting foot at the bass end of the box. The lines A – E indicate the locations of the individual cross-sections shown in figures 3.95 – 3.99. Scale 1 tick : 1 cm; grid scale 1 square : 2 cm.*

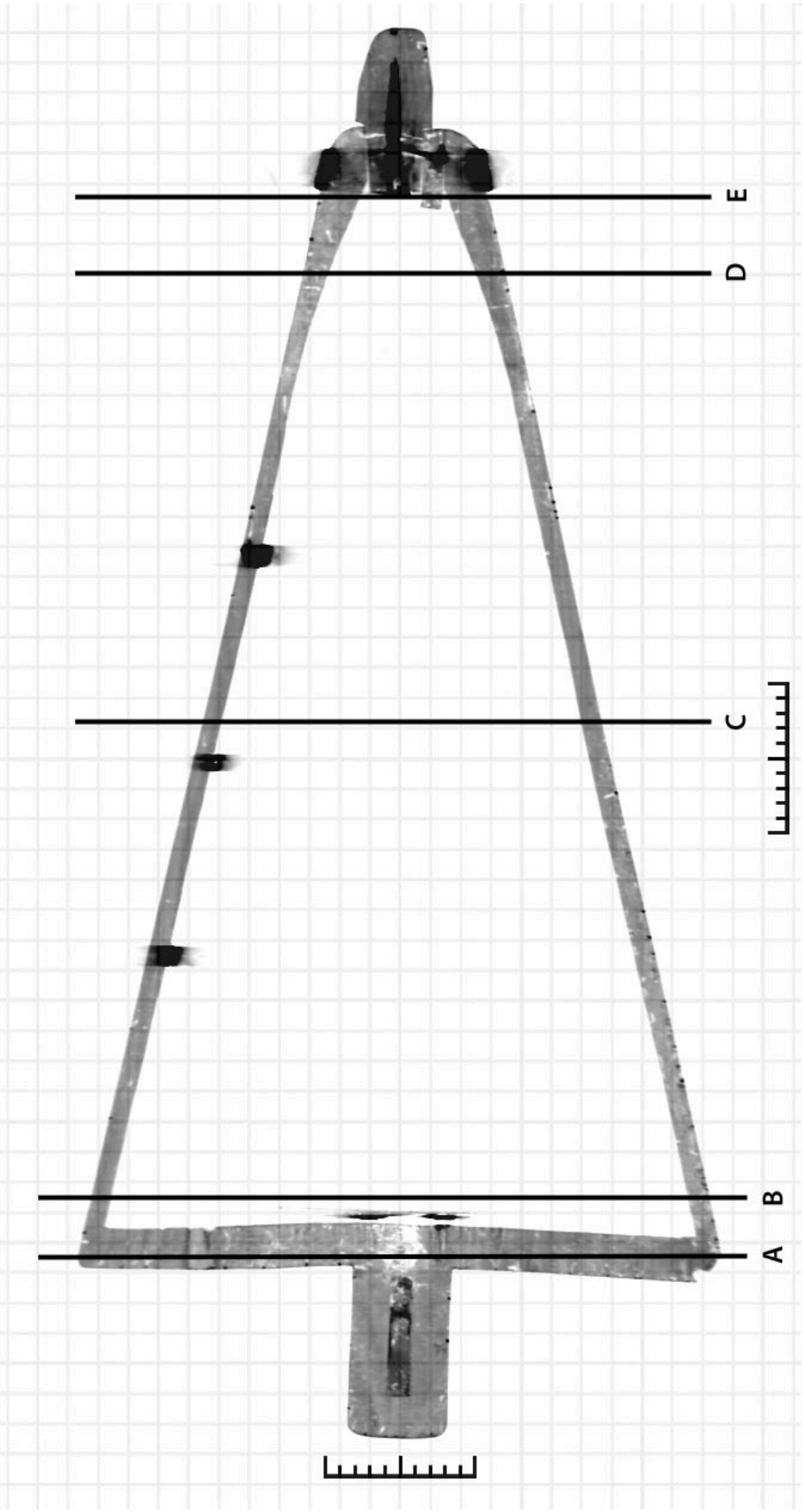

E
D
C
B
A

Figure 3.95 (overleaf): *Lamont soundbox cross-section A (see figure 3.94). This is a cross-section through the bass end of the soundbox, which shows the orientation and pattern of the growth rings. Scale 1 tick : 1 cm.*

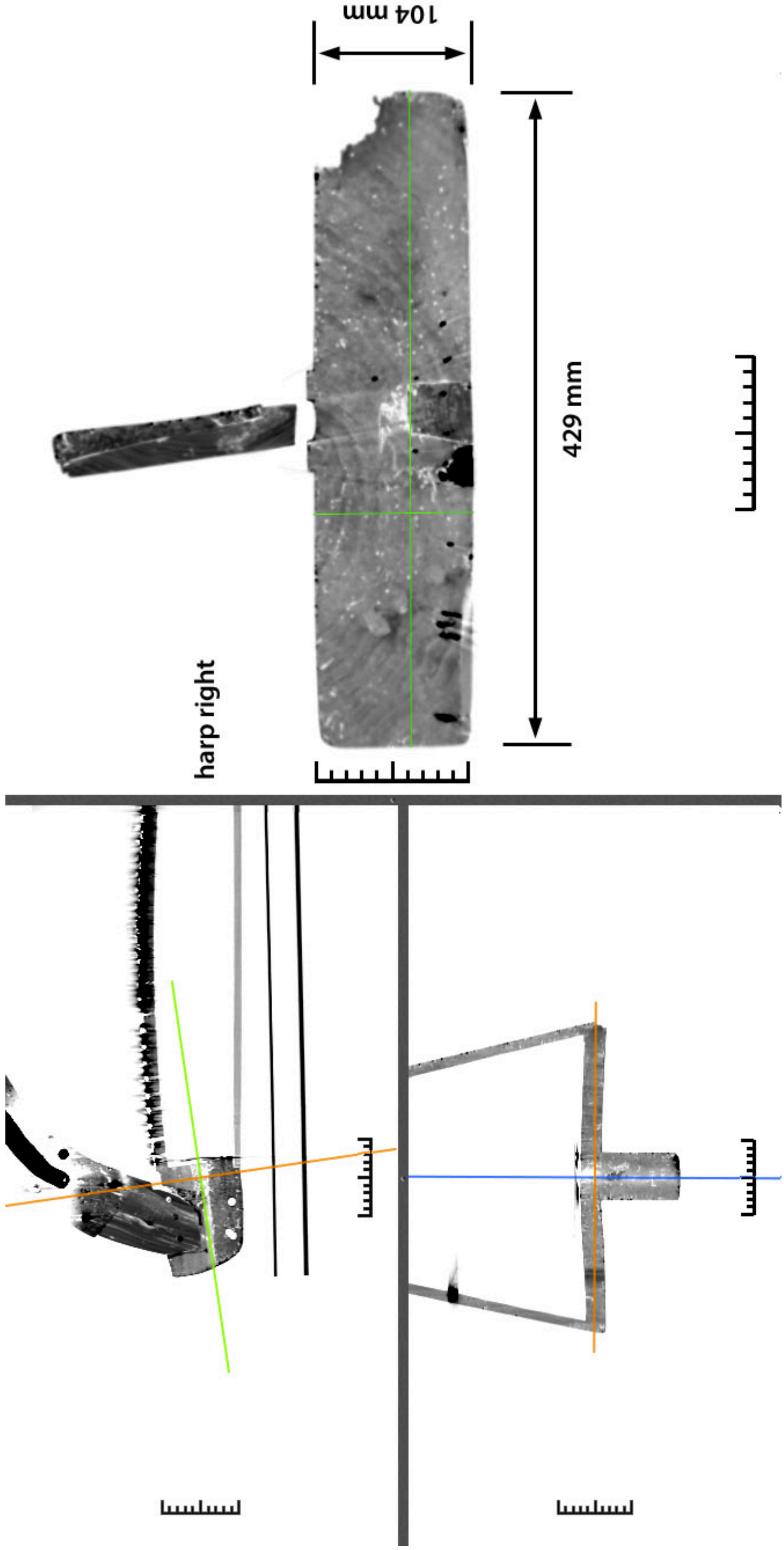

104 mm
429 mm
harp right

Figure 3.96 (overleaf): *Lamont soundbox cross-section B (see figure 3.94). The raised string band can be seen in profile at the centre of the front of the soundbox. Note that the interior surface of the soundbox underneath the string band is flat. This makes the soundbox less vulnerable to developing cracks along the edges of the string band. Scale 1 tick : 1 cm.*

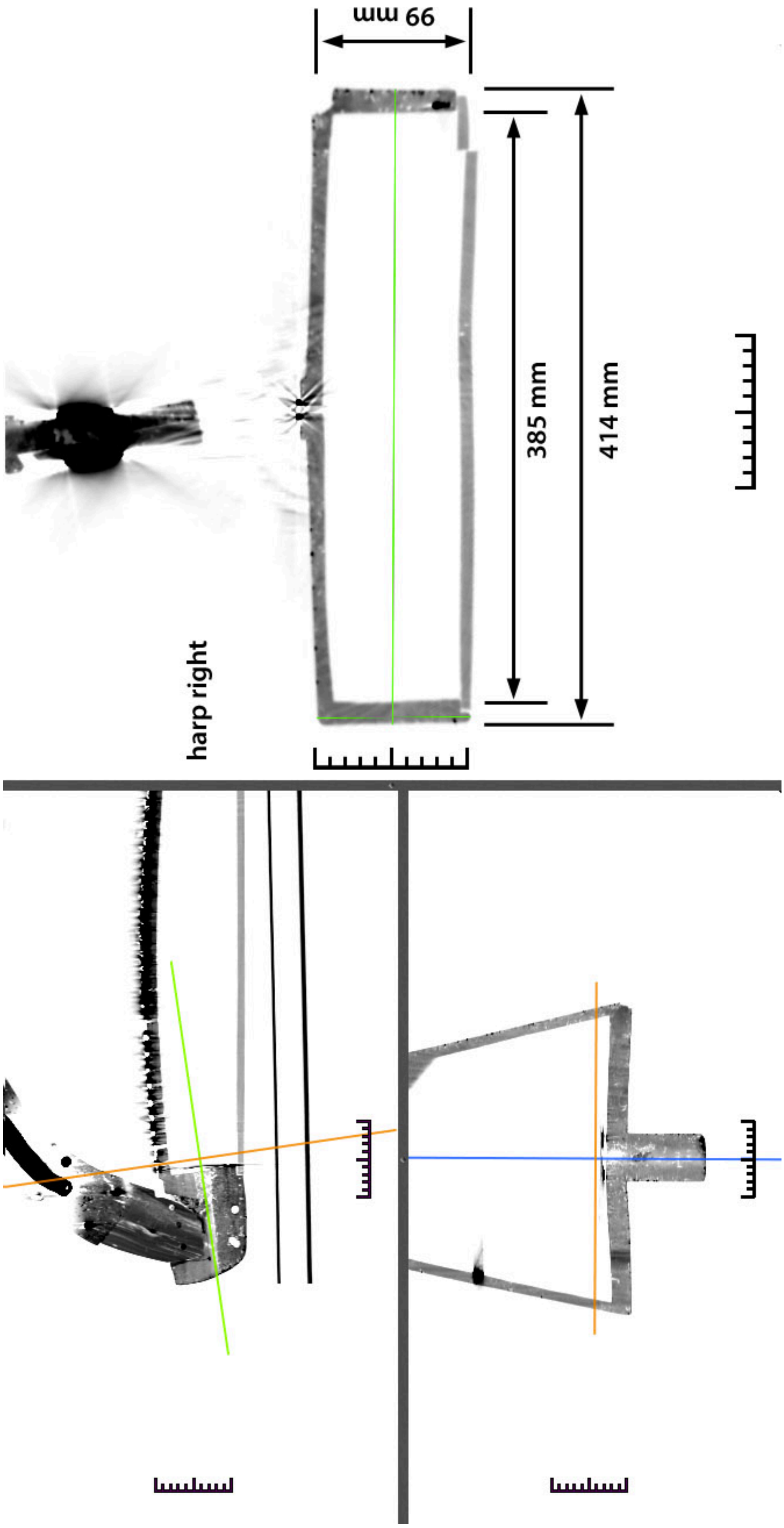
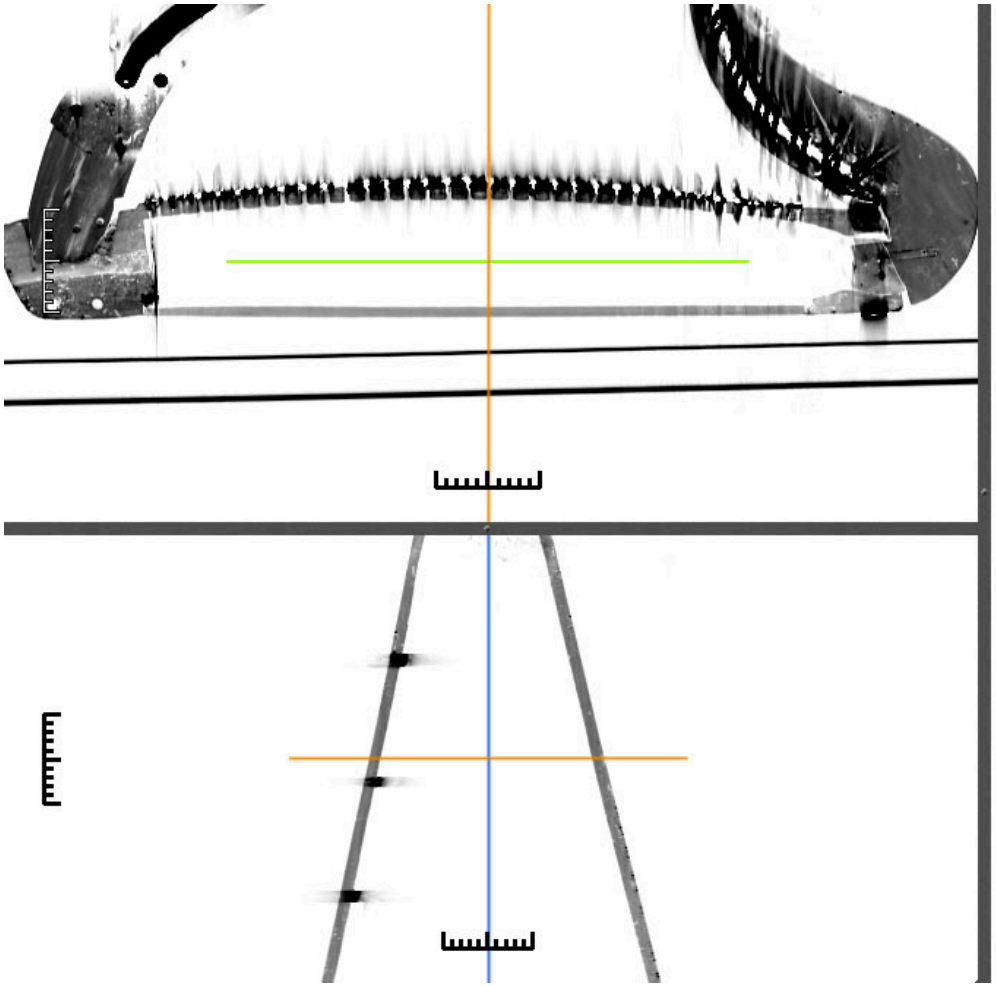

99 mm
385 mm
414 mm
harp right

Figure 3.97 (overleaf): *Lamont soundbox cross-section C (see figure 3.94). Scale 1 tick : 1 cm.*



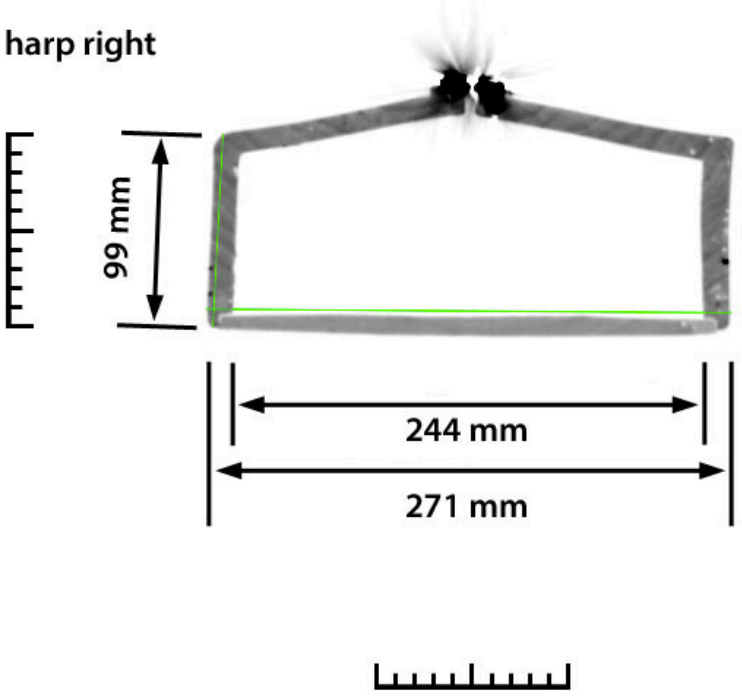

harp right
99 mm
244 mm
271 mm

Figure 3.98 (overleaf): *Lamont soundbox cross-section D (see figure 3.94). Scale 1 tick : 1 cm.*

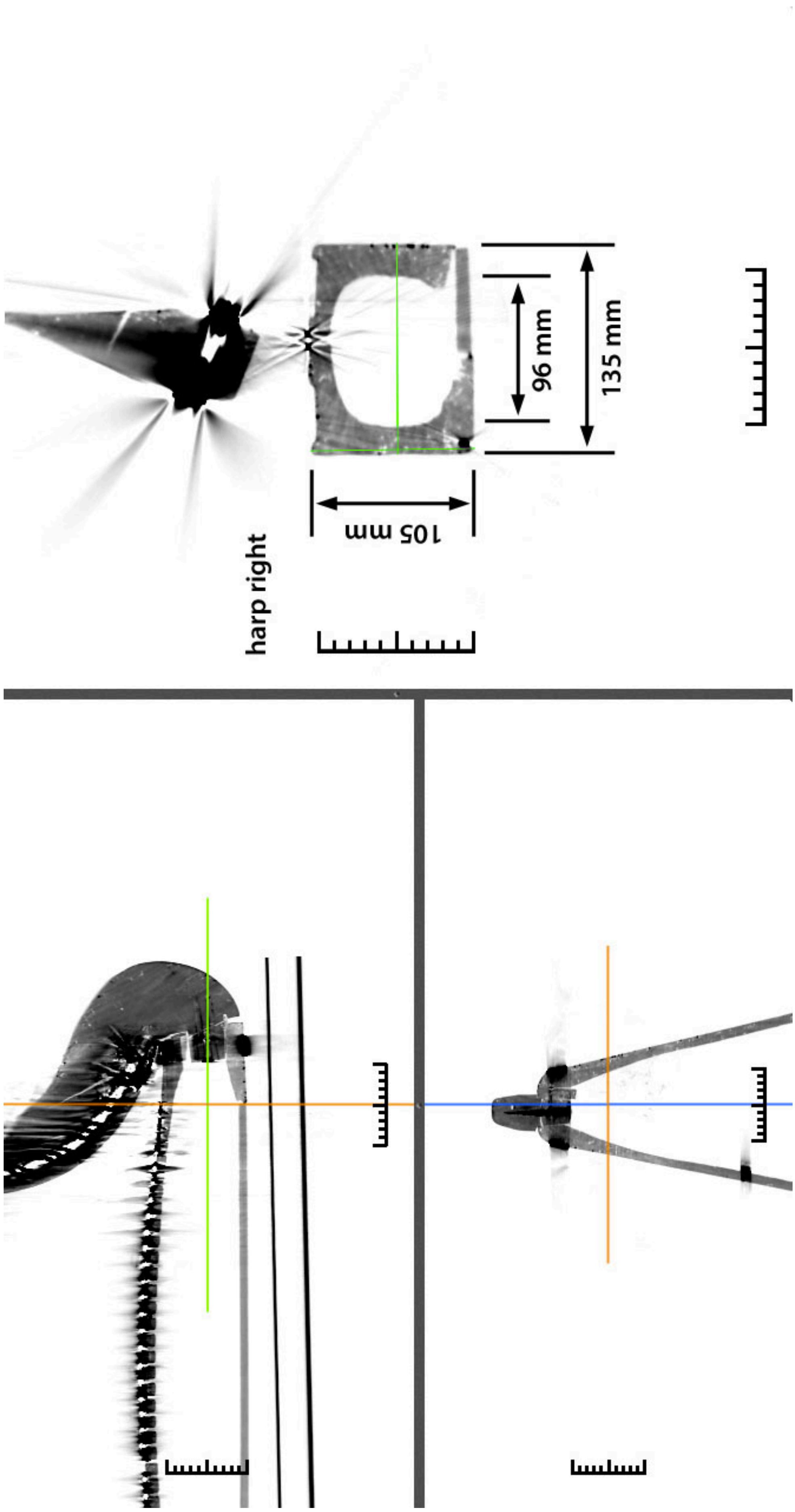

96 mm
135 mm
105 mm
harp right

Figure 3.99 (overleaf): *Lamont soundbox cross-section E (see figure 3.94). Scale 1 tick : 1 cm.*

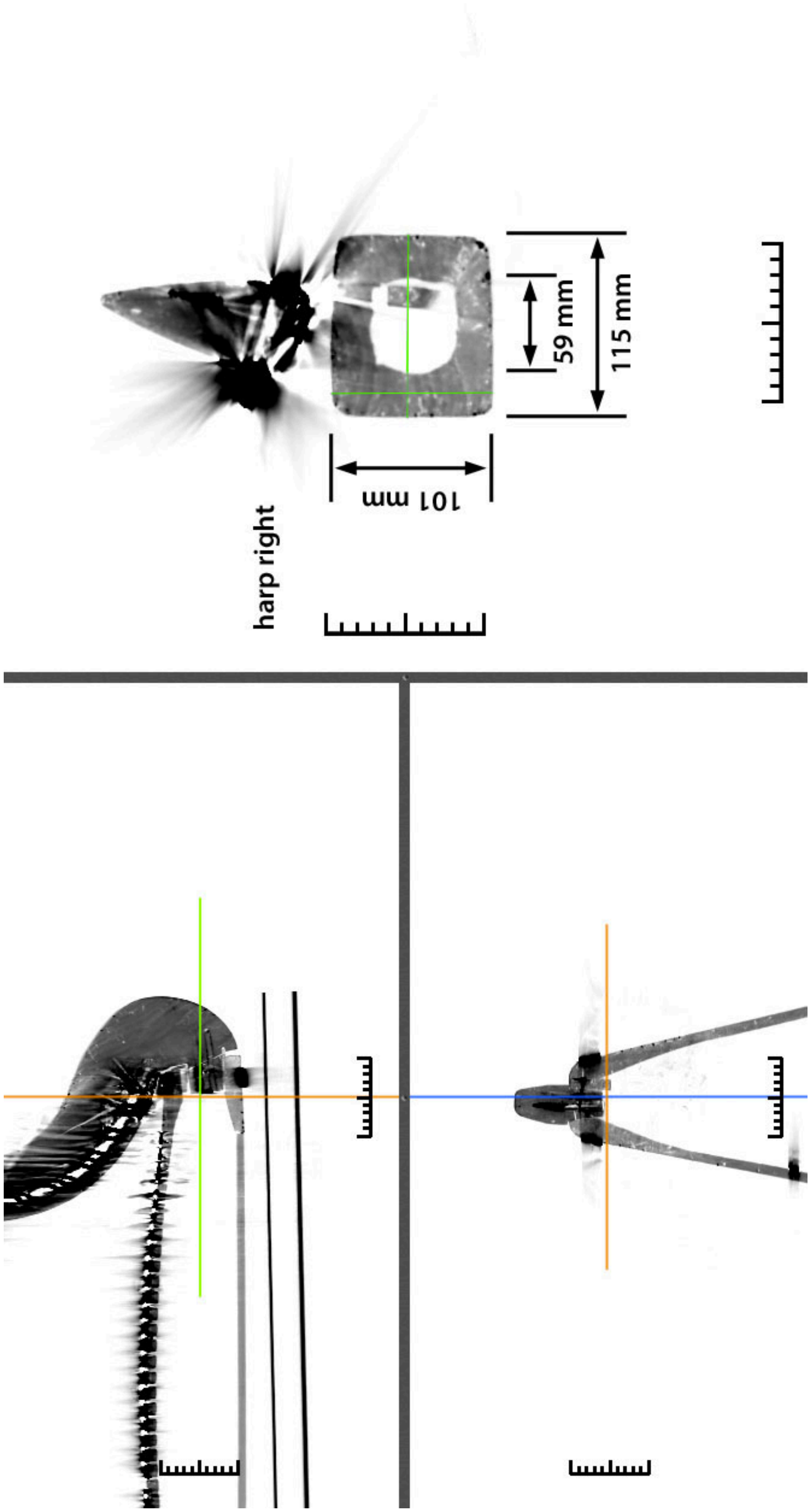

harp right
59 mm
115 mm
101 mm

Figure 3.100 (overleaf): *tomogram of the front of the Lamont harp soundbox showing the positions of the string holes and sound holes. Because the front of the soundbox is curved due to the belly, in order to show the entire surface this tomogram is a 5.7 cm thick slice. The view is from above the soundbox looking down. The right-hand side of the harp is on the left. Scale 1 tick : 1 cm.*