

### A rare 1698 Joachim Tielke *angélique*

Brompton's of Mayfair, an auction-house specialising in musical instruments, took in, for sale in their October 2013 auction, a newly-discovered and unusual instrument made in Hamburg during the late seventeenth century by the famous lutemaker Joachim Tielke. As Brompton's plucked-instrument consultant, I was called in to evaluate it. This was a rare opportunity to inspect an instrument by this maker, whose work is not often seen outside a museum environment. As a result, I have been able to establish Tielke's original conception and to date the spruce soundboard. It has also been possible to examine the inside of the body using X-ray imaging, to investigate whether the construction is consistent with other known instruments of the lute family, and to note modifications to the instrument's original condition.

Sadly, the second pegbox, above the first bent-back head, was removed and discarded at some stage. Presumably it was of swan-neck design, like that on the extant 1704 Tielke instrument. Although this was a major alteration, made in accordance with changing musical fashion, it may well have been this step that saved the instrument from being discarded altogether. The modification allowed it to be used as a functional instrument, which was otherwise largely left untouched. In addition, what was thought to be the remains of a 300-year-old gut string was lodged in the bridge, prompting a further and related study.

The *angélique*, sometimes known in English as the *angelica*, and historically, the 'angel lute', was a relatively short-lived form of lute, related to the theorbo family. It was very much in vogue from the middle of the seventeenth to the beginning of the eighteenth centuries. This is evident both from the surviving tablatures (which are not extensive) and the extant instruments.

Of the compass of the *angélique*, Michael Prynne, in his edited transcription of the relevant passages from the Talbot Manuscript says:<sup>1</sup>

This rather unsatisfactory instrument tried to take advantage of the more ringing tone of strings sounded open, but at the expense of compass. With sixteen single strings the tuning ranges only from D to e' in a diatonic scale.

It is interesting to compare the *angélique* to some other plucked fretted instruments. Thurston Dart, for example draws the following (very simplified) comparison:<sup>2</sup>

Theorbo G' -A' -B' -C-D-E-F-G-A-d-g-b-e-a: nine frets  
 Lute C-D-E-F-G-A-d-g-b-e' -a' : nine frets  
 Archlute F' -G' -A' -B' -C-D-E-F-G-c-f-a-d' -g' : nine frets  
 Angélique C-D-E-F-G-A-B-c-d-e-f-g-a-b-c' -d' -e' : ten frets<sup>3</sup>  
 Guitar Aa-dd' -gg-bb-e' : ten frets

Friedemann Hellwig remarks that the lute in general was ‘largely made to the requirements and pretensions of its players: musicians of noble *Kapellen* and dilettanti from the nobility and the upper bourgeoisie<sup>4</sup> and the same would be true of the *angélique*.

Although mainly popular in Germany and France, the *angélique* found its way to England (as did the one under discussion here, at some point) as the entry in Samuel Pepys’s diary for Saturday 23 June 1660 testifies:<sup>5</sup>

Met with Mr. Chetwind, and dined with him at Hargrave’s, the Cornchandler, in St. Martin’s Lane, where a good dinner, where he showed me some good pictures, and an instrument he called an *Angelique*.

The music for the *angélique* is written in standard French tablature, like that for the baroque lute, and in many cases consists of lute pieces transcribed from d-minor tuning or transcriptions from baroque guitar pieces. The left-hand technique is simple, indeed ideal for the dilettante, because the instrument is tuned diatonically, but as a result it is all the more difficult for right hand. Figure 1 is an example of tablature for the *angélique*, taken from the Béchune manuscript; many of the strings are played open, indicated, in the usual manner, by the tablature letter *a*.<sup>6</sup>

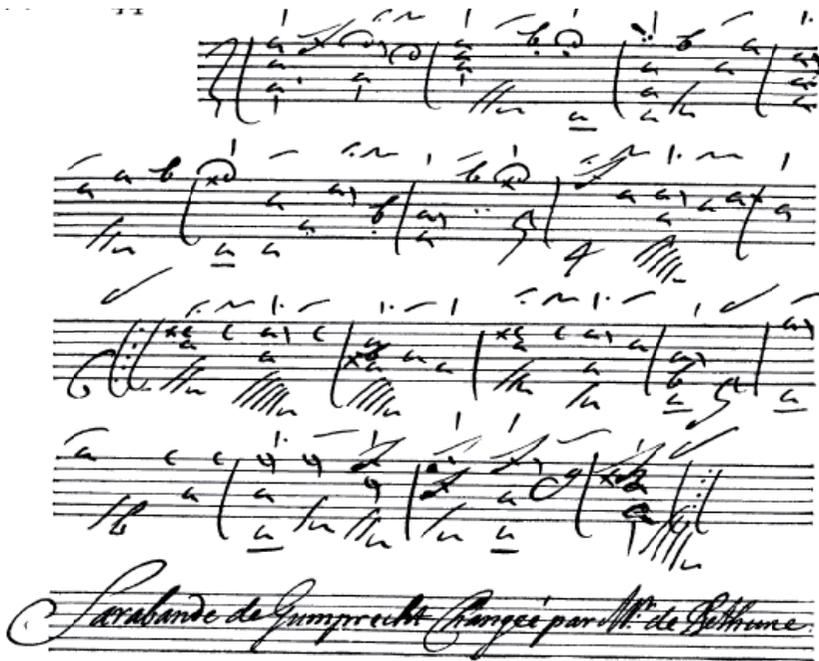


FIGURE 1: Tablature for the *angélique*, from the Béchune manuscript.

## The maker and his work

Little in the way of an introduction to Joachim Tielke and his work is needful here, in view of the Hellwig family's comprehensive writings, and other published literature about him.<sup>7</sup> Joachim Tielke was born in Königsberg, Prussia, in 1641. By 1669, the date of his earliest known instrument (a viol in the Musée des Instruments de Musique de Bruxelles), he was a citizen of Hamburg. His workshop produced a wide variety of instruments, and besides extant examples of lute family instruments, there are bell citterns, pochettes, violins, a violoncello, violas d'amore without sympathetic strings, viols and barytons. To date Friedemann and Barbara Hellwig have recorded 172 instruments from Tielke's workshop.<sup>8</sup> It is clear from the variable quality of workmanship that he did not work alone: he probably employed several assistants, apprentices and journeymen. He worked until his death in 1719, twenty-one years after the manufacture of the angélique considered here.

## The 1698 angélique

Perhaps the most famous (certainly the most repeated) remark about the evidence for authenticating musical instruments, in this case guitars, has been made by José Romanillos: '... the label, as far as the authenticity of the guitar is concerned, is the least reliable aspect of the instrument in question ...'<sup>9</sup> Romanillos urges the investigator to base judgements upon the instrument's construction rather than the paper label which can be counterfeited or removed. There is much to be said for his view, but when it is possible to gain close knowledge of labels that are judged, on good grounds, to be authentic, then it is worth looking at them first, as this will often determine the course the investigation will take thereafter.

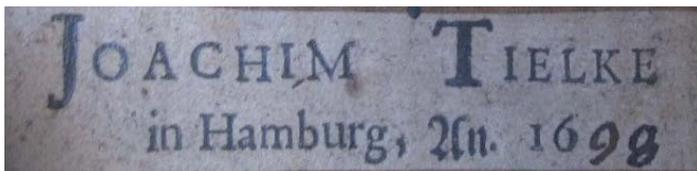


FIGURE 2: The maker's label found inside the 1698 angélique.

Comparing the type to other genuine labels from Tielke instruments, the 'H' in 'JOACHIM' for example sits a little lower on the 1698 angélique label than in other examples. It resembles the label in a viola da gamba of 1695. On the labels in two other violas da gamba, dated 1696 and 1702 (therefore falling either side of the 1698 angélique) the typesetting is slightly different; but this could be explained by Tielke having more than one batch of labels, and the one in our instrument being taken from an older batch.



FIGURE 3: The 1698 angélique by Joachim Tielke, back and front views.

It was fairly easy to establish that this lute was originally made as an *angélique*. The original bridge retains its original sixteen evenly-spaced string holes (ten for strings positioned over the neck and six for non-fretted strings) analogous to most other known *angéliques* (although some are known to have had seventeen strings). Figure 4 below shows the bridge in its current condition; the six-pointed stars help to indicate the position of the sixteen single strings; the four-pointed stars mark a possible later double course arrangement.



FIGURE 4: The original bridge, viewed from the front (with stars added to clarify the positions of holes in two different historic configurations).

One can only speculate what kind of instrument the modifications were designed to create since the additional holes in the bridge do not match the later slots in the nut, suggesting that there had been more than one change to the stringing. Perhaps it was even played as a double-course instrument although this arrangement would add up to at least eleven strings, and there were only ten tuning pegs once the second head was removed.

The string holes are also visible in the X-ray image shown as Figure 7 below. It would appear that the original sixteen holes are of two different diameters. Holes 1 to 7 (counting from the treble side, left to right in Figure 4) are 1.5 mm in diameter and holes 8 to 16 are 1.8 mm.<sup>10</sup> Of course, this information reveals much less than it might, since we cannot establish the original string-length. If, however, there exists somewhere another *angélique* of similar dimensions, with its original neck length, but perhaps lacking its original bridge, these figures might complete the picture. The relatively small string-holes are noteworthy: although this may indicate that overspun strings (in existence for half a century by 1698), or even loaded-gut strings (as proposed by some modern string makers) were employed on the bass side on this particular *angélique*, we must remember that because the tuning was diatonic, the gauge of the strings may have been gently graded.<sup>11</sup> This could also explain why it is not until the eighth string that the diameter of the hole increases; and then from the eleventh string onwards, the strings ran to the second pegbox and so were longer, which would result in a step down in gauges.

Also visible in Figure 4 are the remains of a rope-like string which emerges from hole sixteen and loops through hole fifteen and feeds back into hole sixteen again. The string was carefully removed, but after a closer, microscopic examination it was proven not to be gut, and therefore unlikely to have had any part in the production of music. This was disappointing, because extant instruments show that these sixteen-single-string

'lutes' had a comparatively short life, and since this is a late example whose second head may have been removed quite early on (making the six bass holes redundant), if it had been a gut-string remnant, it might just have remained *in situ* since its original life as an angélique. It was common for late seventeenth-century angéliques to be converted to other instruments not long after they were made. The inventory of the Gotha Court orchestra in 1750, for example, lists 'Eine Theorbe, so aus einer Angelique gemacht worden' ('a theorbo, made from an angélique').<sup>12</sup> Furthermore, all the Tielke instruments first catalogued as theorbos are now thought to have originally been angéliques or lutes.<sup>13</sup> In the future perhaps some of these may be shown to have had a short life in their original form.

It is interesting to note, but not unexpected, that the bridge is curved to correspond to the cambered fingerboard and the bass extremity is approximately 0.5mm higher than the treble side.<sup>14</sup> The bridge also tapers in width, from the bass to the treble, by approximately the same amount. Although this may seem an insignificant amount, it is no error and is of course found on other contemporary lutes.<sup>15</sup>

The instrument retains what is probably its original fingerboard which would originally have accommodated nine or ten moveable gut frets (though extant tablatures only seem to call for five). The nut is now in the approximate position of the original first fret. It was not possible to determine the original string length, but based on the rather small size of the instrument this may well have been in the 500 mm range rather than the more usual 700 mm range; it is not suggested that the neck has been drastically shortened, though the truncation of the decorative pattern on the back of the neck is perhaps a little suspicious.

The extant pegbox is interesting for the slot on the bass side, which appears to be designed to take shorter pegs for the two lowest courses in the lower pegbox, which would make tuning easier and also allows for more strings in the lower pegbox to have a direct route to the nut without weakening it by making the bass-side wall thinner. This slot is not present on most conventional German baroque lutes like those by Hoffmann and Schelle and Widhalm, nor in Tielke instruments which were not certainly or probably angéliques.<sup>16</sup>

The body outline is the long teardrop shape that was widely favoured in France and Germany in the seventeenth century, rather than the rounder, fuller shape of many late renaissance instruments. The neck appears to be deliberately angled to the bass side, as is quite common on lutes with an extended bass range. The tortoiseshell/ivory intarsia work to the back of the neck appears to be laid over a lighter red-paste substrate, accentuating the mottled figure of the material, the darker shades complementing the stained maple ribs; the use of a purely floral interlace pattern for the back of the neck seems unusual, perhaps unique for Tielke, who usually reserves this for cut out ivory inlay on pegboxes.<sup>17</sup>

There is excessive wear to the soundboard on the treble side, close to the bridge corresponding to late-renaissance and baroque 'thumb-out' hand position, resting the little finger around the extremity of the bridge.<sup>18</sup> There is a clue to the manner of holding the instrument in the original ivory strap buttons which are evident at the back of the

neck joint and at the base.<sup>19</sup> Furthermore, there is an ivory edging which is pinned to the treble side only, which can be seen in Figure 5, below. This could be to strengthen the edge (of thin maple) should the instrument be rested upon a table, as often seen in depictions of lutenists.<sup>20</sup> The instrument appears to have once had a parchment or lace edging; possible evidence for this is shown by a light mark all the way around the edge of the belly. This is not found on other instruments by Tielke, and furthermore it only makes sense if it preceded the ivory edging.



FIGURE 5: The back of the body, showing the additional ivory capping strip.

The back is constructed from nine fluted maple ribs, which are not separated by any stringing. With time the exposed joints have become worn, revealing the natural maple colour, contrasting with the dark staining and polish. The resulting effect is as if in imitation of light fillets between the darker ribs, something which was not probably originally intended, since the joints become darker towards the less exposed, neck area and the region approaching the end clasp. The polish looks original, with a later over-varnishing. It is possible that the degree of fluting of the maple ribs occurred over time, with the shrinkage of the reinforcing paper or parchment accelerating this feature naturally.<sup>21</sup>

Dendrochronology often plays an important role in the dating and authentication of musical instruments. With an instrument such as this, however, bearing an original Tielke label, exhibiting all the hallmarks expected of his workshop, and in relatively unscathed condition, the dating of the soundboard seemed hardly necessary. Nevertheless, for the sake of thoroughness, and the furthering of research into soundboard chronologies, not least Tielke's own tonewood supplies, tree ring measurements were carried out. The soundboard was scanned and the resulting images were sent to Peter Ratcliff, a specialist in the dendrochronology of musical instruments, who extracted and analysed the tree-ring data.

The soundboard was found to be made of two matching halves, with the join slightly off-centre, with a small wing on the treble side. The two halves achieved a significant t-value (a statistical measure of the cross-correlation of ‘wiggle matches’ between two pieces of wood)<sup>22</sup> of  $t=14.9$  against each other; 148 rings were measured on the bass side, 153 on the treble. The results of the cross-dating of the two series show that the latest ring on both the treble and bass sides dates from 1616 (the bass side showed tree growth rings from 1468 to 1616, the treble side from 1463 to 1616). Highly significant correlations were found with many instruments, including an Italian cittern attributed to Giovanni Salvatori in the Cité de la Musique, Paris (E543) which achieved the highest t-value at  $t=12.3$ , followed by a Venetian guitar of *c.* 1600 (a Sellas school guitar, in the workshop of David Whiteman). Many other instruments also featured in the output. The data also correlated significantly with Master Reference Chronologies from Austria and Switzerland at t-values exceeding 7.

Occupying the soundhole is the original rose, and although the initial circular scribed line around the outside is so deep one might at first sight think it was made separately, it was actually carved from the soundboard, as is evident from tool marks left outside the boundary of the rose. It is not of the finest execution, as on other Tielke instruments. It is identical to the rose in an instrument catalogued as a ‘théorbe’ (E.27), in the Musée de la Musique, Paris, and to the rose on a lute by Blasius Weigert Linz 172[1?] in the Germanisches Nationalmuseum No. MIR 898. Although hard to discern, because the design is truncated, and some small parts are detached, the design is based around a six-pointed star (a star of David), which harks back to the Middle Eastern origins of the lute family. There is a further central star, and the design is adorned with interlocking geometric ‘wickerwork’ with added ‘tramlines’, and ‘bound together’ by vines.

One possible explanation for the truncation of the apex is that the soundhole, in keeping with the smaller than average lute body size, is also smaller (the soundhole diameter is just 78.5 mm); perhaps the craftsman used a ‘standard’ size template (or an ink-block directly onto the soundboard) so that the border of the template fell outside the soundhole circumference. Supporting this hypothesis is the fact that the soundhole diameter which would encompass the whole design would be 97.5 mm, matching the sizes of some other known lute soundholes. However, truncated Star-of-David designs are quite common at this period, and baroque lute roses are usually smaller than the standard renaissance rule-of-thumb of one third of the soundboard width at that point.<sup>23</sup>

Inside the body, two broken fragments of the main ‘meander’ pattern from the rose (visibly absent in Figure 6) were found. Parchment was found on the lower surface of one of these pieces, which was presumably left to reinforce the fragile border; it may even have contained the original template pattern, if the basic outline was cut and pierced from below. Visible through the rose are the short ‘matchstick’ supports flanked by longer and sturdier strengthening bars.<sup>24</sup>

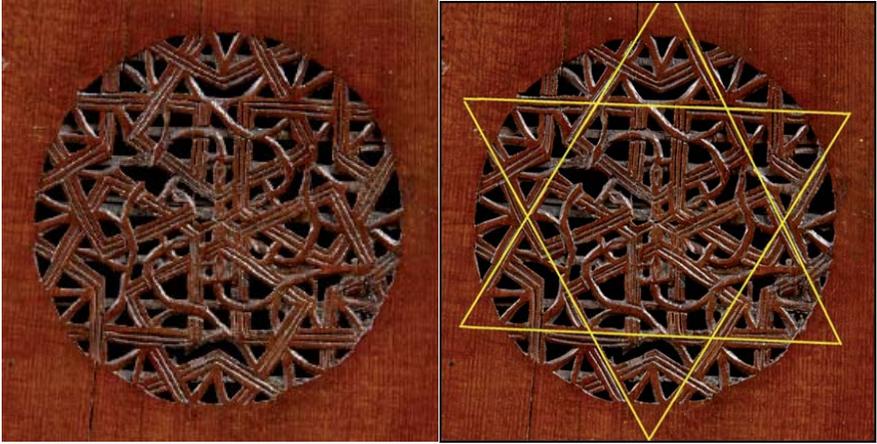


FIGURE 6: The rose (left) with truncated Star-of-David motif highlighted (right).

The X-ray images show that the inside of the soundboard is supported by six main transverse bars which serve two main functions: to protect the belly against the tension of the strings and to divide it into separate vibrating sections which largely determine the sound properties of the instrument. In addition to this are a small number of short braces (it is uncertain if the small bars around the bridge are locating bars used during construction or a part of the overall design of splayed braces, One on the bass side below the bridge looks like a sort of vestigial J-bar).

As can be seen in Figure 8, the neck is attached to the neck-block without dovetails or the like, but rather with glue and a single iron nail; the normal way that lute necks were fastened. The blurred image towards the base of the instrument may be a fur ball (affectionately known as a 'mouse'). This is three hundred years of accumulated dust and hair; probably containing very interesting DNA, but sadly not that of Joachim Tielke or his assistants, since it is believed that skin cell DNA breaks down with time!

Examining this instrument was a magnificent opportunity to explore some lesser documented organological features of a baroque instrument of the theorbo family. It was interesting to the present author to discover how little is known about this interesting but neglected instrument, which existed prior to the 'German theorbo' (also commonly displaying single courses, and diatonically tuned in the bass) and prior to the 13-course lute, and may have had an influence upon their subsequent development, whether through the design or stringing, not least in that Tielke's *angéliques* were turned into other instruments.<sup>25</sup> It also demonstrates how inseparable the science of instrument technology is from playing and composing. I have raised more questions than I have offered answers, in the hope of inspiring further discussions.



FIGURE 7: X-ray image of the Tielke 1698 angélique, body with bridge and lower bars.

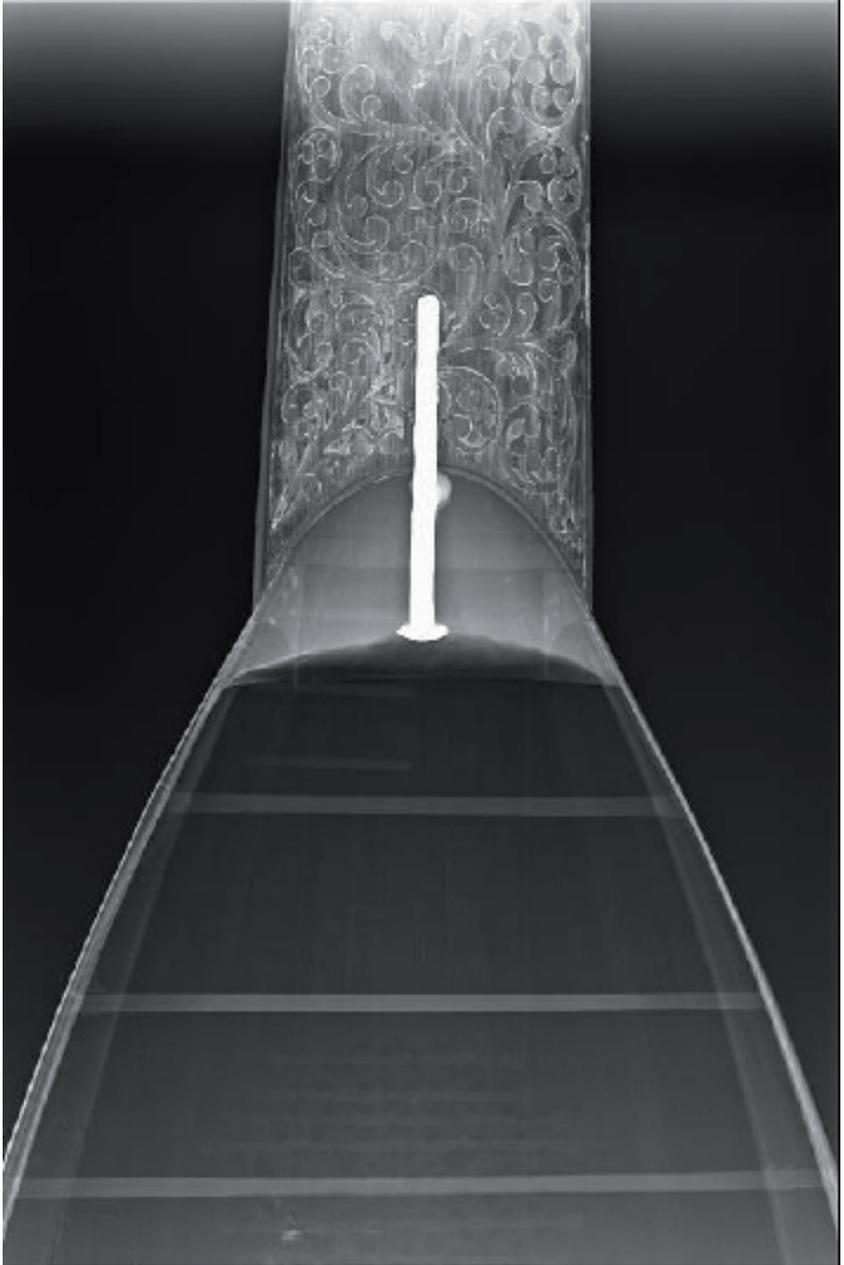


FIGURE 8: X-ray image of the Tielke 1698 angélique, rose and neck joint.

## Notes

I would like to thank Peter Horner of Brompton's auction house, and the present owner for permission to investigate this instrument. I would further like to thank Taro Takeuchi, Ulrich Wedemeier, Sasha Batov, Andreas Schlegel, Friedemann Hellwig, Tony Johnson, Chris Egerton, Christopher Page, Jim Woodhouse, George Stoppani, for their help and advice, Peter Ratcliff for his dendrochronology report, and the staff at Nuffield Health, Brighton for carrying out X-ray imaging.

- 1 Michael Prynne, 'James Talbot's Manuscript (Christ Church Library Music MS 1187): IV Plucked Strings—The Lute Family', *The Galpin Society Journal*, vol. 14 (March 1961), p. 66.
- 2 Thurston Dart, discussing instruments in Diderot's Encyclopedia, in 'Notes and Queries' *The Galpin Society Journal*, vol. 6 (July 1953), p. 111, which is followed by François Lesure, 'The Angélique in 1653', Dart's comparison is an over simplification. The existence of 17-string angéliques is noted at p. 5, above.
- 3 The surviving tablatures for angélique would indicate that five (tied) frets were more commonly in use, though Talbot describes instruments of nine or ten frets.
- 4 Friedemann Hellwig, 'Lute Construction in the Renaissance and the Baroque', *The Galpin Society Journal*, vol. 27 (May 1974), p. 22.
- 5 Robert Latham and William Matthews (eds.), *The diary of Samuel Pepys, a new and complete transcription*, vol. 1 (London: Bell, 1970), pp. 182–3. I do not know when the instrument considered here came to England.
- 6 François Lesure, ed., *Manuscrit Béthune: tablature d'angélique (luth) : (Bibliothèque nationale, Paris, Rés. 16* (facsimile, Geneva: Minkoff Reprint, 1978).
- 7 See Günther Hellwig, *Joachim Tielke: Ein Hamburger Lauten- und Violonmacher der Barockzeit* (Frankfurt: Verlag Das Musikinstrument, 1980), and Friedemann and Barbara Hellwig, *Joachim Tielke: Kunstvolle Musikinstrumente des Barock* (Deutscher Kunstverlag: Berlin/München, 2011). Friedemann and Barbara Hellwig have posthumously catalogued the 1698 angélique online, and assigned the number: TieWV 101a. See: <http://tielke-hamburg.de/documents/Addenda-101a.pdf>, accessed July 2013.
- 8 See <http://www.tielke-hamburg.de/documents/Intro-Errata-and-Addenda.pdf>, accessed 30 September 2013.
- 9 José L. Romanillos, *Antonio de Torres, Guitar Maker: His Life & Work* (Westport: Bold Strummer, 1990), p. 147.
- 10 It should be remembered that string-hole size will be larger than that of the diameter of the string. The interesting measurement, however, is the transition from the angéliques seventh hole (note f), where presumably the string would be at its maximum size, to the eighth hole (note e).

- 11 Loaded strings are strings to which metal salts have been added (resulting in a reddish brown colour; observed in some iconography) to make them denser and therefore thinner, for a given sounding pitch and tension, than an equivalent plain gut string, a solution proposed to the historical puzzle of thin bass strings. See Mimmo Peruffo, 'The mystery of gut bass strings in the sixteenth and seventeenth centuries: the role of loaded-weighted gut', *Research*, v, 1993, pp. 115–51. For some colour reproductions of old master paintings which accord with this hypothesis, see Mimmo Peruffo, *The Lute in its Historical Reality* (Vicenza: Aquila Corde, 2012).
- 12 Folio 20<sup>o</sup>, item 10 as reported in Christian Ahrens, 'The Inventory of the Gotha Court Orchestra in 1750', *The Galpin Society Journal*, vol. 60 (April 2007), p. 44.
- 13 See the instruments catalogued as 'theorbes': cat. nos. 131, 132 and 136 in Günther Hellwig, *Joachim Tielke . . .* (1980).
- 14 It was not possible, however, for me to determine how much of the bridge's curvature was original (if any), and how much was caused by the doming of the soundboard due to the pull of the strings over time.
- 15 The bridge also appears to be angled, relative to the later inlaid frets and nut, and centreline of the neck. On modern guitars the bridge is slightly angled the other way so that the strings are longer on the bass side than on the treble side; this is to compensate for the lesser elasticity of bass strings, which would otherwise tend to fret sharp. For a discussion of why lute bridges are often angled so that the *treble* strings are longer, see David van Edwards, 'Gut Strings and Angled Bridges', *The Lute, Journal of the Lute Society*, xxv part 1 (1985), pp. 17–28, which investigates the possibility that gut treble strings were less elastic than basses because they were approaching breaking strain. Chris Coakley, in 'Tapered lute strings, angled necks and bridges' Comm. 1810 in *Fomrhi Quarterly* 109 (August 2008) pp. 35–43, suggests another explanation, that an angled bridge compensated for the slight conical tapering of gut strings, referred to in the Capirola lute book of c.1515.
- 16 I am grateful to David van Edwards for noting the significance of this, and for pointing out that this feature is also found on the 1704 *angélique* by Tielke, in the Mecklenburgische Landesbibliothek, Schwerin, the anonymous (possibly Tielke) instrument in Kobenhavn, Musikhistorisk Museum (Carl Claudius Samling) no. 104, and the *angélique* by Tielke in Museum Bellerive, Zurich No. 1963-60,33—all of which show the separate treble chanterelle slot which is such a feature of French theorboes. Tielke's normal thirteen-course baroque lutes do not have this bass slot feature so it appears that it may be a characteristic of his *angéliques*. The famous Adam Falkenhagen (1697–c.1765), engraving (c.1755) from the life by J. W. Stör of Nuremberg, shows a similar slot on a single strung double pegbox instrument which raises the question whether Falkenhagen is here playing an *angélique*, even though the caption describes him as lutenist of the chamber of the Margrave of Bayreuth (private communication).
- 17 Though many of them have the same sort of design in the cut out ivory inlay on their pegboxes; I am grateful to David van Edwards for these observations (in private communication).

- 18 For a wide selection of historic pictures showing the ubiquity of this hand position through the seventeenth and eighteenth centuries, see *Lute News* 94 (August 2010), pp. 16–17; also further pictures of soundboard wear marks on historic instruments.
- 19 A good example of these two buttons in use, as a fastening for a taut ribbon or strap which could rest discreetly on the buttons of the player's doublet, see for instance, Frans van Mieris, *The Letter Writer*, c.1680, in the Rijksmuseum, Amsterdam, accessible online at <https://www.rijksmuseum.nl/en>
- 20 See for instance Thomas Mace, *Musick's Monument* (London, 1676, facsimile, New York: Broude Brothers, 1966), p. 71, though he recommends resting the bottom edge of the lute against a table.
- 21 I am grateful to Chris Egerton, instrument conservator/restorer, for pointing out that broad ribs usually have a natural flute of about 1 mm depth, a consequence of the physical making process, rather than of ageing, as the edges of a wood rib naturally curve upwards as the rib is bent to fit the shape of the mould (for an explanation of the maths of this effect see Chris Coakley, 'The concave surface of ribs', *FoMRHI Quarterly*, August 2008 Bulletin 109, p. 61). Narrow ribs such as those on a chitarrone or Neapolitan mandolin exhibit less of this effect, known as the Poisson effect, but they are often fluted by scraping to give the pleasing 'ribbed' appearance. There may well be some additional influence of shrinking vellum liner-strips, but this would occur most prominently at the time of application/manufacture, or as a result of later restoration interventions. This expanding and shrinking property of the material is one reason that vellum is used with extreme caution in restoration and conservation—it expands significantly when applied with water-based protein glue and shrinks considerably when drying, enough to distort a wood substrate (private communication).
- 22 For a brief account see [http://www.dendrochronology.net/basic\\_dendrochronology.asp](http://www.dendrochronology.net/basic_dendrochronology.asp) the website of the Oxford Tree-Ring Laboratory. Matches of greater than  $t=3.5$  are considered significant; samples from the same tree will usually have values of  $t=10$  or more. So the highest of the  $t$ -values in contemporary instruments mentioned in this paragraph suggests if not wood from the same tree, then at least wood from a geographically close location, with the same microclimate.
- 23 I am grateful to David van Edwards for his advice on this last point.
- 24 For scaleable on-screen copies of these X-rays, which may allow better examination of details consult the online version of this journal, at the url given on the title page, or contact the editor for the original files.
- 25 The most comprehensive writing on this instrument can be found (in German): <http://www.accordsnouveaux.ch/de/Instrumente/Angelique/Angelique.html>, accessed 30 July 2013.