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Lute, §4: Tunings

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Lute, §4: Tunings

4. History.

The European lute derives both in name and form from the Arab instrument known as the ʻūd, which means literally 'the wood' (either because it had a soundboard of wood as distinct from a parchment skin stretched over the body, or because the body itself was built up from wooden strips rather than made from a hollow gourd). The Arab *ʻūd* was introduced into Europe by the Moors during their conquest and occupation of Spain (711–1492). Pictorial evidence shows Moorish *ʻūd* players, and 9th- and 10th-century accounts tell of visits of famous players such as Ziryāb to the court of the Andalusian emir ʻAbd al-Raḥmān II (822–52). The *ʻūd* was not confined to Muslims, however, as is shown by illustrations to the *Cantigas de Santa María* of Alfonso el Sabio (1221–84) which include players in distinctive Christian costume. However, from pictorial and written evidence it is clear that by 1350 what we must now call lutes, since there is no longer any connection with Arab musicians, had spread very widely throughout Europe, even though trading and cultural links with Moorish Spain were not well developed. We need to look elsewhere for a route that would lead to the eventual domination of European lute making by numerous German families who came originally from around the Lech valley region and Bavaria. Bletschacher (B1978) has argued that this was due largely to the royal visits of Friedrich II with his magnificent Moorish Sicilian retinue to the towns in this valley between 1218 and 1237. The valley was a main north–south trading route across the Alps, with the necessary raw materials growing there in abundance, so it would have been a natural focus for any such development to occur, even more so following the Venetians' capture of Constantinople in 1204 which so greatly increased their trading activities with the Near East. The *ʻūd* is still in use although it no longer has frets. Over the centuries it has undergone structural changes analogous to those of the lute, and thus differs from both the original *ʻūd* and the medieval lute.

As no lutes from before the 16th century have survived, information must be gathered from pictures, sculpture and written descriptions. These indicate that the lute has usually had its strings in pairs, and that at first there were only four such 'courses'. From the start, lutes were made in widely different sizes, and therefore of different pitches. Both pictorial and written evidence point to the use of different sized lutes for treble and ground duet performance (see Polk, F1992). During the 15th century a fifth course was added. Masaccio depicted two five-course lutes in his altarpiece, *Virgin and Child* (1426; now in the National Gallery, London). Later, in his *De inventione et usu musicae* (*c*1481–3), Tinctoris mentioned a sixth course and there are even tablatures from this period calling for a seven-course lute, though no contemporaneous pictures show one.

The earliest extant account of structural details for the European lute is in a manuscript of about 1440 written by Henri Arnaut de Zwolle (see Harwood, D1960). Arnaut described both the lute itself and the mould on which it was built, combining the two in the same diagram. His design was unmeasured but instead was worked out in terms of geometrical proportion, including the positions of bridge, soundhole and three transverse bars. Almost 200 years later, Mersenne (1636) described the design and construction of a lute by remarkably similar methods. By this time the number of soundboard bars had doubled, but the placing of three of them, as well as that of the soundhole and bridge, corresponds with that given by Arnaut. There can be no doubt that

there was a well-established tradition of instrument design by geometrical methods, going back to the '*ūd* at least as far as the 9th and 10th centuries (see Bouterse, D1979). It is perhaps significant that a portrait (1562) of the lute maker Gaspar Tieffenbrucker surrounded by his lutes and other instruments shows him holding a pair of dividers. However, when Arnaut's design is compared to lutes shown in most paintings of the period, it is in fact rather different, being oddly rounded at the top of the body. The very long neck he specifies is almost never shown. This suggests that, as an enquiring scholar, he may have been given the general principles of design by the lute maker(s) he consulted, but not the exact relationships which determine the precise shape and which may have been regarded as a craft secret.

Medieval lutes usually had two circular roses, one large and more or less halfway between the bridge and the neck, as specified by Arnaut, the other much smaller and higher up the body close to the fingerboard. The large rose was occasionally of the ornate 'sunken' variety, often with designs similar to some gothic cathedral windows. This may have been intentional, for Arnaut calls the rose in his drawing 'Fenestrum'. Around 1480 there was even a brief fashion for the upper rose to be in the form of a lancet window, and interestingly just such a rose has survived in the clavicytherium now in the RCM, London, which has been dated to about 1480 (see E. Wells: 'The London Clavicytherium', ***EMc***, vi, 1978, pp.568–71).

The '*ūd* was, and still is, played with a plectrum, and at first the same method was used for the lute (see figs.4 and 5). With this technique it was probably mainly a melodic instrument, playing a single line of music, albeit highly ornate, with perhaps strummed chords at important points. However, some of the very early plectra are shown as large and solid looking, implying that the lute may also have been used as a percussive rhythm instrument rather like the Romanian *cobză*, which closely resembles the very early medieval lute, especially in the wide spacing of the strings at the bridge and the shortness of the steeply tapering neck (see Lloyd, B1960). This may explain the early drone tunings (see §5 below).

During the second half of the 15th century, there was a change to playing with the fingertips, though, as Page (B1981) pointed out, the two methods continued for some time side by side. Tinctoris (*c*1481–3) wrote of holding the lute 'while the strings are struck by the right hand either with the fingers or with a plectrum', but did not imply that the use of the fingers was a novelty. However, the change was very significant for the lute's future development, for it allowed the playing of several parts at once, and meant that the huge repertory of vocal part music both sacred and secular became available to lute players. This function was made easier by the invention about this time of special systems of notation known as tablature, into which much of this repertory was transcribed (intabulated). There were three main kinds of tablature for the lute, developed in Germany, France and Italy respectively. A fourth early system, 'Intavolatura alla Napolitana', was also used from time to time. Of the four main types the French may have been the earliest. The German one was probably written during the lifetime of Conrad Paumann (*c*1410–1473), the supposed inventor of the system. Although Tinctoris had mentioned a six-course lute, these first tablatures, and indeed the very names by which the strings of the instrument were known, suggest five courses as still the most usual number at this time.

By about 1500 a sixth course was commonly in use, which extended the range of the open strings by another 4th to two octaves. This may have been enabled by improvements in string making. Gut was used for all the strings and it was usual on the two or three lowest courses to set one of the pair with a thin string tuned an octave higher, to lend some brilliance to the tone of its thick neighbour.

By 1500 the first written records confirm the existence of several lute-making families in and around Füssen in the Lech valley. Most of the famous names of 16th- and 17th-century lute making seem to have originated from around this small area of southern Germany. By 1562 the Füssen makers were sufficiently well established to form a guild with elaborate regulations which have survived (see Bletschacher, B1978, and Layer, B1978). A careful reading of these regulations reveals how much they were predicated on the idea of export. They also show an organized tendency to keep the trade within individual families, which resulted in much intermarriage. This was a powerful force for continuity which clearly lasted for centuries. However, the number of masters who could set up a workshop in the town was limited to 20, so there was a built-in pressure to emigrate. It was also precisely this area which was devastated first by the Peasants' Revolt of 1525, the war against the Schmalkaldic League (1546–55), and finally by the Thirty Years War which killed more than half the population of central Europe. It is hardly

surprising that lute makers, who already had international connections, moved away from the area in such numbers.

Many settled in northern Italy, no doubt attracted by the country's wealth and fashion but also perhaps by the access to exotic woods imported via Venice. The tradition of intermarriage meant that they remained together in colonies and did not become much integrated into Italian society. Luca Maler (*see* MALER) was active in Bologna from about 1503; by 1530 he was a property owner of considerable substance and had built up an almost industrial scale workshop employing mostly German craftsmen (see Pasqual and Ragazzi, B1998). The inventory compiled at his death in 1552 lists about 1100 finished lutes and more than 1300 soundboards ready for use; his firm continued trading until 1613. Among several other lute makers in Bologna were MARX UNVERDORBEN (briefly) and HANS FREI. The main characteristic of their lutes is a long narrow body of nine or 11 broad ribs with rather straight shoulders and fairly round at the base. This form is remarkably close to that proposed by Bouterse (D1979) in his interpretation of Persian and Arabic manuscripts of the 14th century. The chief difference is that these Middle Eastern descriptions, like Arnaut's, indicate a semicircular cross-section, whereas the instruments of Maler and Frei are somewhat ‘more square’. Often made from sycamore or ash, they remained highly prized as long as the lute was in use, but became increasingly rare as time went on. No unaltered example is known to have survived, for their prestige was such that they were adapted (sometimes more than once) to keep abreast of new fashions. They have all been fitted with replacement necks to carry more strings; sometimes the vaulted back is the only original part remaining (see Downing, B1978).

In Venice, as in Bologna, the German colony kept to its own quarter and had its own church. By 1521 Ulrich Tieffenbrucker is recorded as present in the city, and for the next hundred years the TIEFFENBRUCKER family, especially Magno (i), Magno (ii) and Moisé, as well as Marx Unverdorben and Luca Maler's brother, Sigismond, dominated lute making in the city (see Toffolo, B1987). The name Tieffenbrucker was taken from their original village of Tieffenbruck, but their instruments are usually signed Dieffopruchar and regional spellings abound with variants such as Duiffoprugcar and even Dubrocard. Another branch of the Tieffenbrucker family settled in Padua, including ‘Wendelio Venere’, who has recently been discovered to be Wendelin Tieffenbrucker, probably the son of Leonardo Tieffenbrucker the elder. MICHAEL HARTUNG also worked in Padua and may have been taught by Wendelin, although Baron (C1727) stated that he was apprenticed to Leonardo the younger. The typical body shape of these Venetian and Paduan lutes was less elongated than that of Maler's and Frei's instruments, and the shoulders were more curved (fig.10*a*, *c–f* [not available online]). The first examples had 11 or 13 ribs, but later the number was increased, a feature associated with, but not exclusive to, the use of yew, which has a brown heartwood and a narrow white sapwood. For purposes of decoration, each rib was cut half light, half dark, which restricted the available width and required a large number of ribs, sometimes totalling 51 and even more. The yew wood was supplied from the old heartland of lute making in south Germany, and cutting the ribs for Venetian makers became a valuable source of winter employment there (see Layer, B1978).

The use of geometrical methods of lute design has already been mentioned, and it has been found by several writers that the shape of these instruments can be readily reproduced by such means (see Edwards, D1973; D. Abbott and E. Segerman: ‘The Geometric Description and Analysis of Instrument Shapes’, *FoMRHI Quarterly*, no.2, 1976, p.7; Söhne, D1980; Samson, D1981; and Coates, D1985). This may account for the similarity in basic form between instruments of different sizes and by different makers. By comparison with the modern guitar, these early lutes, whether of the Bolognese or Paduan type, are distinguished by the lightness of their construction. The egg-like shape of the lute body is inherently strong and does not need to be built of very thick materials. Although the total tension of up to 24 gut strings (for later lutes) can be as much as 70–80 kg, the well-barred thin soundboard withstands this pull remarkably well. Though in the 17th century, as Constantijn Huygens's correspondence makes clear, it was routine to re-bar old lutes as part of their renovation, this may have had more to do with alterations in barring layout than structural weaknesses.

The instruction to tune the top string as high as it will stand without breaking is given in many early lute tutors (though not by Dowland or Mace). If the highest string is lowered for safety's sake much beneath its breaking point, the basses will be either too thick and stiff or, if thinner, too slack to produce an acceptable sound. Wire-wound bass strings which could ease this dilemma by increasing the weight without increasing the stiffness are not known to have been available until

after 1650, and were apparently not much used thereafter either. Therefore, as the breaking pitch of a string depends on its length but not on its thickness, the working level of a given instrument is fixed within quite narrow limits.

In the second half of the 16th century there was a tendency to build instruments in families of sizes (and thus pitches), roughly corresponding with the different types of human voice. The lute was no exception. Examples of the variety of sizes available around 1600 are shown in fig.10. The instrument by Magno Tieffenbrucker (fig.10*a*) has a string length of 67 cm; the string lengths of the instruments shown as fig.10*c*–*g* are 29·9 cm, 44 cm, 44·2 cm, 66·6 cm, and 93·8 cm. Strictly speaking, the smallest of these (fig.10*c*) should be called a **MANDORE** (*see also* **MANDOLIN, §1**). In England the nominal *a'* or *g'* lute was known as the 'mean', and was the size intended in most of the books of ayres, unless otherwise specified. The only other names used in English musical sources are 'bass' (nominally at *d*') and 'treble', which is specified for the Morley and Rosseter *Consort Lessons*. The pitch of these 'treble' lutes implied by the other parts was also *g'* but it is possible that this music was intended to be played at a pitch level a 4th higher than that of the mean lute (see Harwood, B1981). This nomenclature of 'treble' has caused some interest and, taken together with a number of specifically English pictures of small-bodied long-necked lutes, may indicate a particular English variant (see Forrester, B1994).

It should be noted that although all sorts of sizes were available at most times, the general trend from 1600 to 1750 was towards larger instruments for common use. Thus, for example, we might expect Dowland's songs to be accompanied on a lute of about 58 cm string length tuned to a nominal *g'* or *a'*, whereas most French Baroque music of the mid-17th century calls for an 11-course lute of about 67 cm with a top string at a nominal *f'*, while the lutes used in Germany in the 18th century were mostly 13-course instruments of about 70–73 cm, also with a nominal top string of *f'*. Some of this may represent a drop in the pitch standard, but we must also assume that string makers had managed to improve their products to increase the total range available, since these size changes represent considerable changes in the instruments' requirements. Apart from the development of overwound strings, this increase in range could only have been achieved by increasing the tensile strength of the trebles, by making the thick basses more elastic and flexible or by increasing the density of bass strings, perhaps by the addition of metallic compounds (see Peruffo, D1991). There is currently much interest in trying to reproduce these conjectured developments. It is noticeable from written accounts that the cost of strings was remarkably high compared to that of the lutes themselves, leading to the thought that there was more to their manufacture than is now apparent.

Although seven-course lutes appear as early as the late 15th century, and Bakfark's apprentice, Hans Timme, wanted to buy an Italian seven-course lute as early as 1556 (see Gombosi, F1935), it was only in the 1580s that they became at all common with the seventh course pitched at either a tone or a 4th below the sixth (see §5 below). Improved strings are conjectured to have popularized this greater range, perhaps providing a better tone and enabling John Dowland, in his contribution to his son Robert's *Varietie of Lute Lessons* (1610), to recommend a unison sixth course:

> "Secondly, set on your Bases, in that place which you call the sixt string, or γ ut, these Bases must be both of one bignes, yet it hath beene a generall custome (although not so much used any where as here in England) to set a small and a great string together, but amongst learned Musitians that custome is left, as irregular to the rules of Musicke."

The same book, reflecting the growing tendency to increase the number of bass strings, included English and continental music for lutes with six, seven, eight and nine courses. This only occasionally extended the range to low *C*; mostly the extra strings were used to eliminate awkward fingerings resulting from having to stop the seventh course. These 'diapasons' were usually strung with octaves. Already by the early 1600s the ten-course lute had made its appearance, shown in contemporary illustrations as constructed like its predecessors, with the strings running over a single nut to the pegbox, which has to be considerably longer to accommodate the additional pegs. The pegbox is also usually shown as being at a much shallower angle to the neck than the earlier Renaissance lute, a fact borne out by the surviving original ten-course lute by Christofolo Cocho in the Carl Claudius collection, Musikhistorisk

Museum, Copenhagen (no.96a). Often the paintings of ten-course lutes show a treble 'rider', a small extra pegholder on top of the normal pegbox side, designed to give a less acute angle on the nut for the fragile top string.

Another innovation reported by Dowland in *Varietie* was the lengthening of the neck of the instrument:

> "for my selfe was borne but thirty yeeres after Hans Gerles booke was printed, and all the Lutes which I can remember used eight frets … some few yeeres after, by the French Nation, the neckes of the Lutes were lengthned, and thereby increased two frets more, so as all those Lutes, which are most received and disired, are of tenne frets."

Initially this may have been done to improve the tone of the low basses, but unless stronger treble strings became available at the same time, the pitch level of these longer lutes must have been lower than the older eight-fret instruments. Interestingly, one such lengthened neck survived until quite recently, but when it was 'restored' this important source of evidence for the practice was removed. Sometimes extra wooden frets were glued on to the soundboard, an invention which Dowland attributed to the English player Mathias Mason.

It is interesting that Dowland should thus report the prevailing fashion in lutes as coming from France, for by his death in 1626 France was the dominant culture musically and was the centre for developments in different tunings, starting some time around 1620, which led to the 11-course lute. Lowe (B1986) has suggested that the 11th course may at first have been only an octave string. The later surviving 11-course lutes mostly appear to be conversions of ten-course instruments, all done in the same way, by making the second course single and adding a treble rider for the top string or 'chanterelle' on the top of the normal pegbox treble side. This effectively gave two extra pegs which were used for the new bass course, but, because the neck was now too narrow, these strings were taken over an extended nut which projected beyond the fingerboard and were fastened to the pegs on the outside of the pegbox. The famous portrait of Charles Mouton clearly shows that this was obviously not regarded as a stopgap measure. This final extra course on the same string-length has often been attributed to the invention of wire-wound or overspun strings, first advertised in England by Playford in 1664. However there is distressingly little hard evidence that these were in fact much used and they are not mentioned by either Mace or the Burwell tutor even though both wrote about the choice of strings. As Lowe (B1976) has shown, during the 17th century the French were already buying and converting early 16th-century Bologna lutes, seemingly because of a new aesthetic which valued the antique. There are so few surviving lutes with any claim to have been made in France that it is not possible to be sure what their makers were producing by way of new lutes at a time when lute playing was so important to French musical life. One must assume that the French cannot all have been playing on antique instruments. Indeed the inventory of the French maker Jean Desmoulins (*d* 1648) points to a vigorous rate of production since it lists 249 lutes in various stages of construction as well as 14 theorbos both large and small (see Lay, F1996). Only one lute by this maker has survived (Cité de la Musique, Marseilles).

Makers working in Italy, where the old tuning held sway, had already addressed the problem of extending the bass range in the 1590s by the expedient of having longer and therefore naturally deeper-sounding strings carried on a separate pegbox. The theorbo, chitarrone, *liuto attiorbato* and archlute all had extended straight-sided pegboxes carved from a solid piece of wood set into the neck housing at a very shallow angle and carrying at their ends a separate small pegbox for these extended bass strings. The form of all these instruments is very similar, differing mainly in the length of the extended pegbox, the number of courses carried and whether the bass courses were double or single. It was therefore only to be expected that this principle of longer, and therefore unfingered, bass strings should also be applied to non-continuo lutes. From about 1595 to 1630 various other types of extended pegboxes were tried for the bass strings. In one version, an extra piece of neck was added on the bass side which carried its own small bent-back pegbox. One of these (by Sixtus Rauwolf, 1599, though the extension may be later) has survived in the Carl Claudius collection, Musikhistorisk Museum, Copenhagen and there are several paintings showing this form, including works by Carlo Saraceni (*c*1579–1620) and Jan Miense Molenaer (*c*1610–1668).

More widely adopted was a double-headed lute with curved pegboxes, one set backwards at an angle rather like the normal lute, the other extended in the same plane as the fingerboard. This carried four separate small nuts to take the bass courses in steps of increasing length. This form usually had 12 courses and was apparently invented by Jacques Gautier in about 1630 (see Spencer, B1976, and Samson, B1977) but was not used much by the French who remained largely loyal to their single-headed lutes. As the author of the Burwell Lute Tutor (*c*1670) wrote: 'All England hath accepted that Augmentation and ffraunce att first but soone after that alteration hath beene condemned by all the french Masters who are returned to theire old fashion keeping onely the small Eleaventh'. He, or she, objected to the length of the longer bass strings and felt that they rang on too much, thereby causing discords in moving bass lines. It was, however, widely used in England and the Netherlands until at least the end of the 17th century. The apparent thinking behind this form was a desire to avoid the sudden leaps in tone quality between the treble and bass strings which characterize the theorbo and archlute forms. An important tutor for this type of lute was Thomas Mace's *Musick's Monument* (1676), in which it was classed as a French lute; Talbot (*c*1695), however, called it the 'English two headed lute'. For Talbot the 'French lute' had 11 courses, with all the strings on a single head. There has been some discussion as to the size of these instruments (see Segerman, D1998). Talbot measured the string length of a 12-course instrument of this type as 59·7 cm; iconographical sources show all sizes. To date, six examples of this type have been found with fingered string lengths of between 50 and 75 cm.

This same principle of stepped nuts for bass strings of gradually increasing length lay behind a specifically English form of the theorbo, which is also described in Mace and was measured by Talbot (see Sayce, B1995; Van Edwards, B1995). Unusually for a theorbo this had double-strung courses in the bass which still further smoothed the transition across the range. None of these have survived. The French too seem to have developed their own version of the theorbo principle in the 17th century with a shorter extension than the Italian theorbo and possibly with single stringing (*see* **THEORBO**).

In Italy in the 17th century the drive towards extending the bass range of the lute was accommodated somewhat more consistently by incorporating the theorbo design into smaller lutes for solo use. Thus the *liuto attiorbato* came to be used in addition to normal lutes and theorbos, and later archlutes, for accompanying singers and continuo work. Matteo Sellas was part of another large German family of instrument makers still based in Italy, and produced very elaborate lutes and *liuti attiorbati* of ivory and ebony at his workshop 'alla Corona' (at the sign of the crown) in Venice. His brother Giorgio made equally decorative guitars and lutes 'alla stella'. Working in Rome, beyond what might seem to be the natural bounds of migration from Germany, were David Tecchler, Antonio Giauna and Cinthius Rotundus, from each of whom has survived an archlute, attesting this instrument's importance in Rome in the 17th and 18th centuries.

By the beginning of the 18th century, the centre of activity in lute music shifted from France to Germany and Bohemia. The makers extended the range of the instrument still further, and by 1719 composers were writing for 13 courses. There were two types of 13-course lutes developed and it is hard to say which was first, since both are possible conversions from pre-existing 11-course instruments and so labels are not conclusive. Paintings of both types are surprisingly rare. In one version a single pegbox was used like that of the 11-course lute, but, possibly starting as a conversion, a small subsidiary pegbox or 'bass rider' with four pegs to take the extra two courses was added to the bass side of the main pegbox. This had the effect of giving between 5 and 7 cm extra length to these two courses. Commonly these lutes were quite large by previous standards with 70 to 75 cm being the usual string length. From what has been said so far about stringing this must imply a lower pitch for the main strings. It is clear from the details of the tablature that Silvius Leopold Weiss composed throughout his life for this version of the 13-course lute which was developed by the new generation of German makers, working in Bohemia and Germany itself. Among the most important at this time were Sebastian Schelle and his pupil Leopold Widhalm working in Nuremberg (see Martius, B1996), Martin Hoffmann and his son Johann Christian working in Leipzig, Joachim Tielke and his pupil J.H. Goldt working in Hamburg (see G. Hellwig, B1980) and Thomas Edlinger of Augsburg and his son Thomas, who moved to Prague and set up his workshop there. All these makers were violin makers as well, reflecting the growing importance of this instrument at a time when the lute was becoming less in demand.

These makers were also responsible for the other version of the 13-course lute with extended bass strings, the German Baroque lute (see Spencer, B1976). This had an ornately curved double pegbox carved out of a single piece of wood, usually ebonized sycamore. This type did not

usually have a treble rider, but did occasionally feature a small separate slot carved in the treble side of the main pegbox to take the top string. Typically this kind of lute had eight courses on the fingerboard and five octaved courses going to the upper pegbox, these five being normally between 25 and 30 cm longer than the fingered strings. This design appears to be a modification of the pre-existing ANGÉLIQUE form. Some apparently early 13-course lutes, such as the 1680 Tielke instrument, dating from long before the earliest surviving 13-course music (*c*1719), seem to be converted 'angéliques'. Others, such as the Fux conversion in 1696 of a Tieffenbrucker instrument and the 13-course lute of Martin Hoffmann dating from the 1690s, raise more awkward questions of dating. An even more elaborate triple pegbox form of this type was also developed and a few examples have survived, notably by Johannes Jauck, a lute and violin maker working in Graz, and Martin Bruner (1724–1801) in Olomouc. These seem to have been functionally the same as the double pegbox form, and they may have represented a further attempt to obtain a smoother transition from the treble to bass courses.

Internally, the barring structure behind the bridge was altered by these makers. Beginning with an increase in the number of small treble-side fan bars, the characteristic J-bar on the bass side of the Renaissance soundboard was finally removed and various kinds of fan-barring were introduced right across this area of the soundboard. These seem to have had the effect of increasing the bass response. The main transverse bars were also made slightly smaller and more even in height, maybe with the same intention. The body outline of these lutes is remarkably similar to that of the early 16th-century lutes of Frei and Maler and this resemblance may well have been deliberate, for the old instruments continued to be highly prized. It was about this time (1727) that the first systematic history of the lute was written, by E.G. Baron. Referring to the lutes of Luca Maler, he wrote:

> "But it is a source of wonder that he already built them after the modern fashion, namely with the body long in proportion, flat and broad-ribbed, and which, provided that no fraud has been introduced, and they are original, are esteemed above all others. They are highly valued because they are rare and have a splendid tone."

This echoes the value placed on Maler lutes in the Fugger inventory of nearly 200 years earlier, which talks of 'An old good lute by Laux Maler' and 'One old good lute by Sig[ismond] Maler'. Baron's comment on the possibility of fraud is also interesting in this context, since there are several surviving lutes with supposedly 16th-century Tieffenbrucker labels which are clearly the work of Thomas Edlinger the younger working in Prague at about the time Baron was published. Thomas Mace too wrote of Maler 'but the Chief Name we most esteem, is Laux Maller, ever written with Text Letters: Two of which Lutes I have seen (pittiful Old, Batter'd, Crack'd Things) valued at 100 l [£] a piece'.

In the 18th century a much simpler form of German 'lute', the mandora, emerged with the same string lengths and barring system as the Baroque lute but usually with only six or eight courses in a variety of tunings. Apparently mainly used by amateurs, it also found a useful niche in orchestras in place of the 13-course Baroque lute as well as for continuo and bass lines in sacred music, especially large scale works.

Throughout the lute's history the gut strings have been matched by movable gut frets tied around the neck. The placing of these frets has always been a problem to both theoreticians and players, and many attempts have been made to find a system that will give the nearest approach to true intonation for as wide a range of intervals and in as many positions as possible. A number of writers, including Gerle (C1532), Bermudo (C1555), the anonymous author of *Discours non plus mélancholique* (1557), Vincenzo Galilei (*Fronimo*, 1568) and John Dowland, put forward various systems, many of which were based on Pythagorean intervals. Late 16th-century theorists in Italy, as well as 17th-century writers such as Praetorius and Mersenne, habitually assumed that the intonation of the lute (and other fretted instruments) represented equal temperament, whereas, in contrast, keyboard instruments were tuned to some form of mean-tone temperament (*see* TEMPERAMENTS).

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