Venetian Harpsichords

by Michael Thomas

INTRODUCTION

In 1956 I started an investigation into the various ways of constructing soundboards and cases of harpsichords and clavichords. I spent about six years in a workshop, and only after this time was I able to go abroad to see many of the old instruments. I was curious to know whether any of the less orthodox ideas with which I had experimented had ever been applied in historical times.

At this time I bought a quantity of broken harpsichord parts which had been left over by Franciolini, the dubious Italian restorer, which included pieces of simple Italian harpsichords mostly from Venice. These Venetian instruments contained many unusual ideas.

My experiments included using soft wood for the bridges, making cases with heavy bottoms, making soundboards very thin in the middle as well as at the edges, making cases of varying depths, and even making a complete instrument out of one log of wood. All these ideas can be used to great effect in the building of instruments, and I feel we should still investigate the lesser-known types of instrument more. Had these ideas been developed further in historical times we might have had instruments which were fuller in tone, more sustaining, yet also with clearer harmonics than those of the better-known traditions of the late eighteenth century. In particular I found that later instruments in Sweden and England seemed to show a relationship to these instruments. They may have influenced the tone of harpsichords in general throughout Europe more than has ever been realized. To listen to the early Venetian (Photo 3A) instrument with extra jacks *(c.* 1510) suggests that the history of the harpsichord has been one of decline.

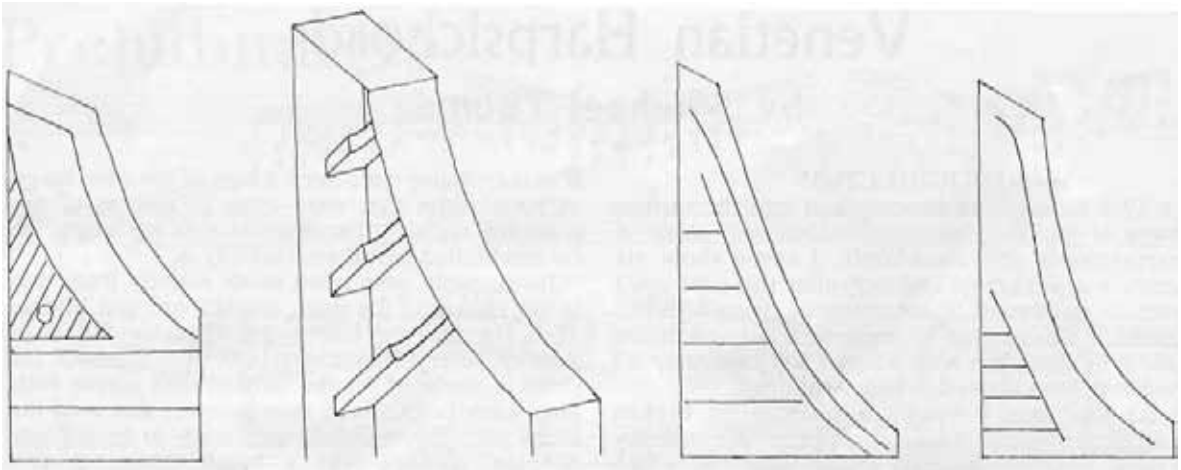
These harpsichords seem to belong to an era in which instruments often had double or sympathetic soundboards, and when some stringed instruments had sympathetic strings. The Tzzard' of 1622 had virtually three soundboards. The principal effect was given by the very free, almost unbarred soundboards, which are discussed below. They have a number of other factors to give a 'hollow' resonance. The treble may be melodic, bell-like and sustaining, or hollow and short-lived.

Before I was able to go abroad and see what the old makers actually did, I spent six years experimenting with what I thought they might have done. It was surprising to find just how much these instruments did vary in the woods used, the internal structure, the weight of the bridge, etc. If makers today were more aware of the wide range of possibilities that were open to makers of the sixteenth century, harpsichord making would be far less limited now than it usually is.

Instruments were often made entirely from one wood, including the sides, soundboard and bridge. Thus, in the very early one that we found in Sweden, everything except the very bottom (in pine) is made of maple. Others used maple with pine soundboards, and later, cypress was used for every part. Some instruments seem to be entirely of pine, perhaps with a beech bridge. A few instruments are made entirely of yellow cedar. All these woods seem to be far more resonant, and produce clearer harmonics than poplar. Poplar occurs in the case of the instrument mentioned below found in Lucca, and was the commonest wood used in the low countries, although pine is frequently found again in the extreme north. The very clear, gentle tone is greatly enhanced when the wood of the bridge is a soft wood. This clarity needed very accurate tuning, which is why many of the instruments have alternative tunings for sharps and flats and are single-strung.

The whole school of playing and instrument construction was against angular music and towards purity, sweetness and circular flowing ornamentation. This style was reflected in the fingering of Diruta, the simple style and modulations of the music, and the tuning with just thirds. Only later did the idea of histrionic music (music showing emotion with contrasted tone colours) come to be popular. This was possibly the result of listening to the different effect of the notes in harpsichords with several guides which were originally to give alternative tunings for the thirds.

Although the Ruckers family tried many different things, their instruments seem to have acted as a limiting factor on later makers, for in Europe (particularly Paris) the Ruckers represented a 'closed end' perfection by which all instruments could be measured. Instruments in the eighteenth century were made by taking earlier Ruckers instruments apart, and new instruments even had 'Ruckers' inscribed on their roses. The Venetian makers, however, were more open ended and could lead to all sorts of experiments, not only in woods, but also in the shape and the barring, as they searched for a broad, lingering sound. The instruments were noble, although gentle rather than spiky. These makers were side-tracked in a way by their search for perfection, which was probably due to the religious and political attitudes



1. Italian upright harpsichord in Oslo.

2. Upright harpsichord in the Hague from Maastricht.

3. Partially masked-off soundboard: Theuwes, Blanchet, Delin.

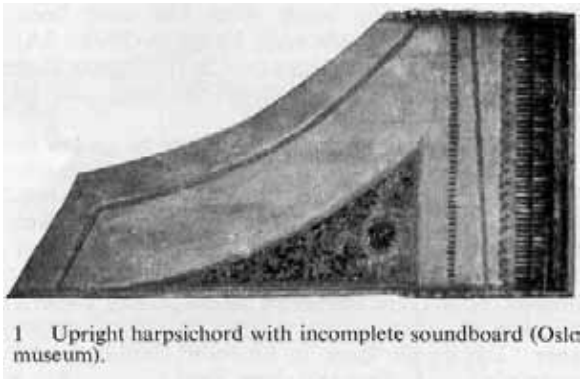
4. Northern-French type of barring (no 4').

in Venice at that time. Many of the instruments had to be single strung because of the complex tunings. Later, Frescobaldi, when he tried to introduce music with a more direct emotional meaning, was considered a coarse man for disregarding the comma in tuning to get bolder and wider modulations.

The Ruckers, on the other hand, had been experimenters themselves, yet many of the instruments that were left are the bright little instruments meant for dances. But the Italian instruments that were made for this kind of music in, say, Florence, have much clearer top harmonics and a less reedy tone, because cypress and cedar seem to vibrate accurately over a wide spectrum. Of course, not all the Ruckers were these small brittle instruments, and at the Paris Conservatoire there is a 1612 Ruckers with enlarged soundboard area. There is also one of 1636 in the Harpsichord Centre, where the soundboard is large, and appears to be very little altered. (This will probably be the subject of an article by Mr. McGeary later in the *English Harpsichord Magazine.)* Frank Hubbard describes these bigger, resonant instruments in *Three Centuries of Harpsichord Making.* I believe they were originally one-manual instruments with a deep case, giving an organ-like tone rather like some big one-manual instruments made later by Dulcken.

When we were experimenting, we found that the most beautiful tone, (although not the loudest), came from a lightly and parallel barred soundboard. The first old instrument we found with such a soundboard was the remains of a Venetian instrument; but in 1960, when we restored the Franco-English Tisseran of 1710, there was the exact soundboard we had rediscovered in our earlier experiments. The bars were parallel to the bridge, so that the whole soundboard could vibrate. In the next ten years I found several smaller C/E Italian instruments with one bar, but only in the last two years have we found two larger instruments (GG-d3) with the parallel bars which we believed to give such a good effect. The general shape of them is shown in Photo No. 2 and Diagram 11.

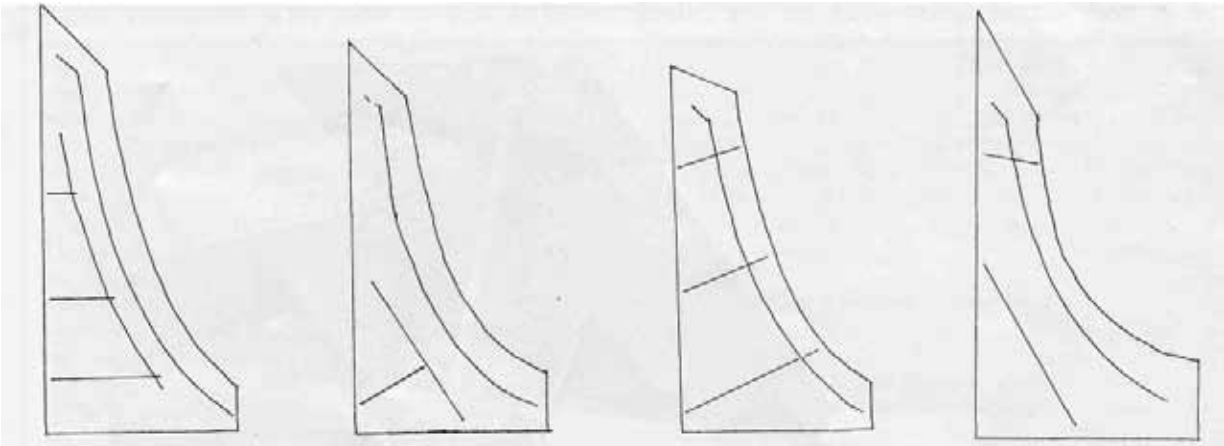
The different types of soundboard There are four types of basic soundboard. Probably they are all to be found at least in Italy, England and France. These categories are arbitrary and not necessarily in historical order. I give the first three to contrast with the fourth which we are discussing in full.



1 Upright harpsichord with incomplete soundboard (Oslo museum).

1. Incomplete soundboards in which only the 8' band is allowed to vibrate

The first photograph is of a small upright harpsichord of Italian origin in Oslo. Another is in the Royal College of Music, but shows signs of Franciolini's work. The soundboard only exists



5. Early Italian version (now in Stockholm museum).

6. The large black instrument (Dr. Mirrey).

7. G. Z. (Zenti) 1673. The commonest late barring. (Harpsichord Centre)

8. The early Venetian, Photo No. 2. (This instrument now belongs to John Sutherland.)

under the 8' bridge. This manner was later used by Arnold Dolmetsch in a spinet.

The second diagram is of a large upright harpsichord found in Maastricht, and now being restored in the Hague museum. The main struts of the case come up, and most of the soundboard is glued to them. The struts are cut out under the bridge, which is the area free to vibrate.

Diagram No. 3 shows the type of barring in the Ludovic Theuwes of 1567, in which there is a large bar, parallel to the bridge and several masking bars. The Nicholas Blanchet of 1693 in Paris probably does this; but the bars are hollow under the 4' bridge. It appears to be an earlier form of Ruckers' barring. It was later to be used again in upright harpsichords (Delin) which seem to follow an earlier tradition.

2. Partially masked off soundboards

When these minor bars are light, a partially masked off soundboard is produced. There is no hard distinction between the first and second types.

Many later instruments in England and France used this type of barring, which is basically the same as the Ruckers. In Italy, the barring exists with a bent main bar and three minor bars. Very occasionally, as in a large unsigned instrument from Rome (Diagram 6), there is only one subsidiary bar. It is the one described below which appears originally to have had four 8' bridges for two registers. The instrument in Diagram 4 is now in the Stockholm museum.

3. Soundboards with bars passing under the bridge, and thus dividing the soundboard into sections

These are the most common types of bars found in later Italian harpsichords. They also occur in France, England and Germany, Spain, Portugal and Sweden. Later eighteenth-century brittle soundboards were often a mixture of these and other barrings. An Italian piano of 1797 has nine such bars an inch deep passing under the bridge. These cross bars produce the most percussive tone and the quickest speech. The upper harmonics of all the notes in the treble register are especially clear. The tone can be excellent if the quality of the wood of the case and soundboard is good (cypress or light pine), but the tone of these instruments seems to depend more on the materials used than on the design. Although these instruments had large amounts of soundboard, partially free to vibrate, their basic resonance was not very different from the small Ruckers. Though the small Ruckers was completely free under the bridge, its vibrating area was very limited by the masking effect of the heavy rigidly-attached 4' hitch pin rail and subsidiary bars. The effect and use of these cross bars is beyond the scope of this article, and developed into one form of the early piano.

4. Soundboards in which the whole soundboard can vibrate

Photo Nos. 3 and 3A show examples of these soundboards. Photo No. 3 is similar to the layout of the instrument with divided registers, Photo No. 3A. In this the bass tone has little depth, as the bridge has not much soundboard surrounding it. It is rhythmic, and suitable for giving the beat from the bass. There are two instruments with original soundboards which show this type of bar, but it is possible that this type was common, and that it was often altered by restoration. The tenor register has the widest spectrum of harmonics, as in the human voice or a mixture stop on an Italian organ. This lower tenor part of the bridge is in the full width of the soundboard, The harmonics are

slightly emphasised in the upper tenor, as the bridge is nearer to the case than in the alto. The alto has too much free soundboard for the top harmonics, and is slightly fluty in tone as a result. The treble lacks power and upper harmonics in the soundboard shown in Photo No. 3 because the soundboard is much too free and wide. The cheek, being long (as in the French indigenous instruments), gives too much treble in the soundboard shown. The brightness is slightly increased by the proximity of the bridge to the jacks. While this bridge position helps to brighten the tone, it decreases the sustaining power. The disposition of the treble part of the bridge of the instrument in Photo No. 3 A is very much better and the tone exceptional.

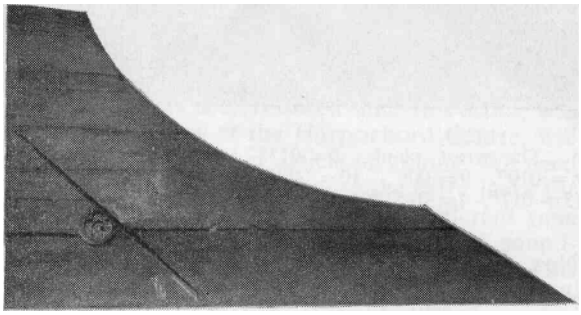
Both instruments have full blending tenors, suitable for chords, but percussive basses. The tenor tone is also further rounded if the wrestplank bridge is bent to gain a distant plucking position in this register. The treble is too weak and hollow if the soundboard does not rest on a solid header— features found in some other instruments. The

2. A typical'Venetian'instrument. The one found in Lucca, before restoration. Notice the side does not follow the bridge shape, and gives a large amount of soundboard in the tenor.

single soundboard bar, I believe, from my experiments, tends to make the soundboard vibrate in nodes parallel to the bridge. This adds to the full tone in the middle of the instrument. It is excellent for slow, sonorous, harmonic playing, but not so good for angular and percussive music. It would seem that the lower registers are seen as the most important, as in Church music of the middle ages. The strings seem to be the ideal length for the tenor, and the treble string lengths feem to be deduced from them by dividing the string length by half for each octave. This gives a relatively short treble, c"=10J—11J". Strings have been found as thin as -0055" on the Francescus Priest of Rimini and those recently found on the Taraglia of 1704 go from -0065" iron to -016" in the bass, the bottom octave being brass. This is fairly representative of old strings found on several of these instruments.

5. The smaller Venetian instruments

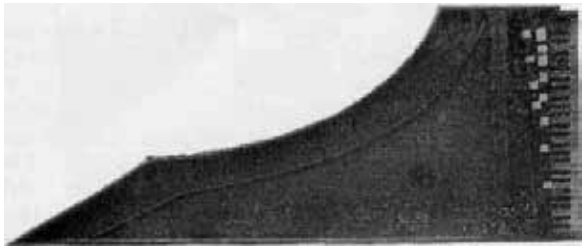
These instruments are about 6' long and have a compass usually of C/E to c'" or d'". Few of these instruments are signed, and the reason for calling them 'Venetian' is based largely on decoration. Photo No. 2 shows the typical shape. *a. An Archicembalo made from pieces* The first example seen in England, this instrument was made up from the Franciolini pile by a student. The case appeared to be built up from an outer travelling case, to which had been added a skirt to house a second manual and a 4' stop. The case and soundboard were of Mediterranean pine. The keyboards which were fitted were ones with divided keys. The pivots of the keys suggested that the fronts of the sharps were E flat and G sharp, which are the usual mean-tone accidentals, and the backs were D sharp and A flat. The top octave was not divided, although this would appear to be the most important. This could again be because the treble was considered less useful in the development of the harmony, or the purpose for which the instrument was used. It was reduced from two manuals to be single strung, but the bridges were not original, so it was guesswork.



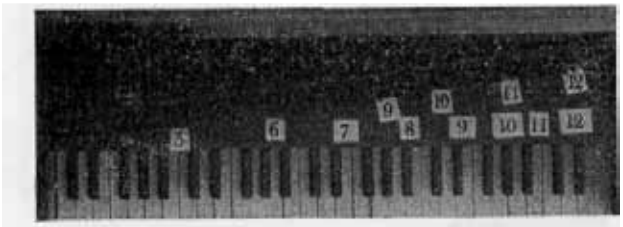
3. The soundboard with a single bar from the instrument which was formerly an archicembalo, 6 in the list.

b. Archicembalo with original soundboard The first instrument which seemed to be reliable evidence and from which the soundboard appeared not to have been removed, was also found in England. The case was of maple, and the soundboard of pine, with a deep, hard angular ring. The soundboard is shown in Photo No. 3 and Photo

3a. The bottom of the soundboard of the instrument with divided registers. The old bar, which appeared-to be original, has been replaced (owing to worm). The bars in new wood have been omitted. The position of the bridge has been marked and the scar of the 4' hitch-pin rail can be seen. This could not have been employed at the same time as the duplicate jacks for D sharp and A flat.



4. The same inst. ument during restoration. As an archicembalo it may have had wider keys. The compass could be increased to its present size by utilizing the extra notes into the twelve-note scale and using narrower keys.



5. The wrest plank. 5=·0135″, 6=·0125″, 7=·011″, 8=·010″, 9=·009″, 10=·008″, 11=·0065″, 12=·0055″ (3=·017″, 4=·0152″).

Nos. 4 and 5 are of the same instrument. This instrument differs in the soundboard from the instrument with divided registers and the Taraglia, as both the latter have a remarkably good position for the treble bridge. In the latter cases the bridge is in the middle section of the soundboard, and this shows that the Italians could have melodic, singing trebles, and that a long string length was, and is, not essential to get this. It seems that the effect depended on the very light, low tension strings balancing the small inertia of the light and free bridge. In other words, many harpsichords used nearly five times the tension and got no better result with the more rigid construction. The front gauges on the wrest plank at the front date from when the instrument was an archicembalo with single strings. Those at the back probably date from the eighteenth century, when it was converted to two 8's (Photo No. 5). The compass is questionable as in all converted archicembali. *c. Fenton House instrument*

There is an instrument of similar shape in the Fenton House collection, but unfortunately, the soundboard has been ripped out, and many extra bars have been added in the fashion of restorations earlier this century. The soundboard has a strong medullary ray, and a deep brown streak. It may, on cleaning, reveal itself to be maple. The bottom two sharps are divided. Otherwise, it is a standard single strung chromatic instrument with divided notes in the bass. *d. The maple instrument*

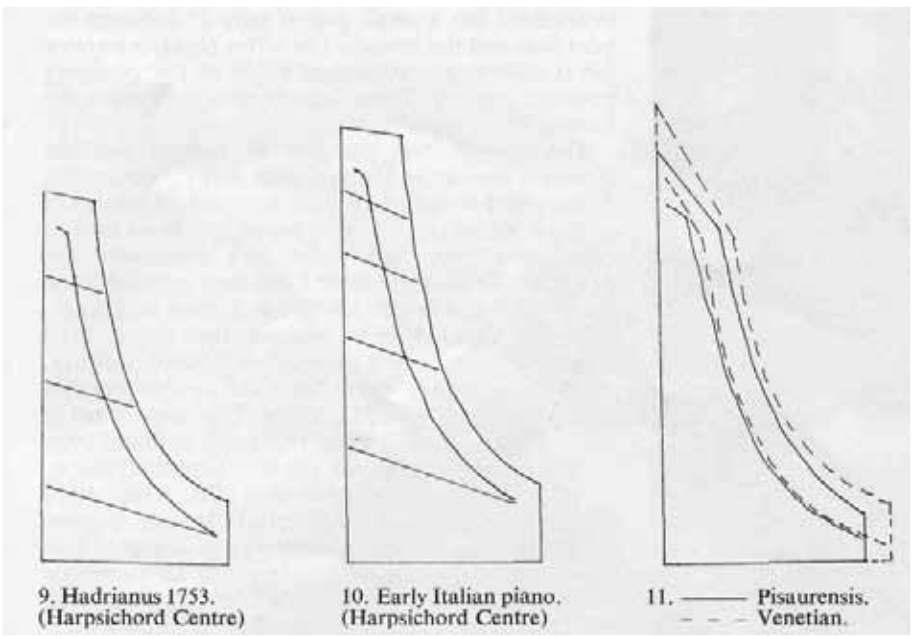
With the exceptional tone similar in construction to the '1503' in Milan museum (Photo No. SA). *e. A 'Venetian' instrument*

Has been found in Paris. The case, soundboard, and bridge are all in cypress. There were two bars in this instrument, but the one nearest the bridge was small and bent and may well have been added later as a 4' hitchpin rail, as there had been a 4' at some stage in its history. This instrument is the basis of the 'Bedard' kit. /. *An instrument with two bars* Photo No. 2 and Diagram 8 show a C/E — c''' instrument found in Lucca in Italy. The shape is similar to the others, but there is a second bar under the tenor as in the crossbarred soundboards. It appeared to be original. The instrument was in a painted case of poplar with a cypress soundboard. The second bar gently inhibits the free tone of the tenor.

6. Later developments with instruments with parallel bars

An eighteenth century harpsichord by Franciscus Priest of Rimini is shown in Photo No.*$&* The light case is of pine, probably Swiss, about |" thick and is similar to the soundboard which at this thickness takes much of the strain from the case which has no reinforcement. The light treble strings - .0055" had to work the lightest bridge which is only .3"x .4" in beech. It is double strung.

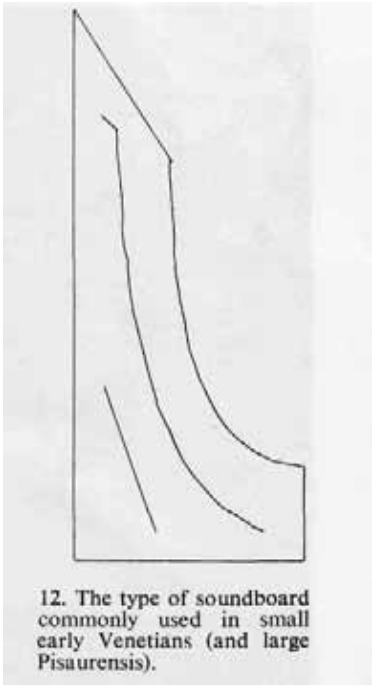
7. Diagram 9 shows an instrument which had **Hadrian or Hadrianus** and, more legibly, Roma 1753 written on the jack cover. Mr. Rainer Schiitze tells me he has seen this barring. Mr. Derek Adlam is also repairing a beautiful harpsichord of this type in which the large bar does not go under the bridge. This instrument is made in an ebony case with cypress soundboard and has a tone finely orientated round the tenor.



9. Hadrianus 1753. (Harpsichord Centre)

10. Early Italian piano. (Harpsichord Centre)

11. ——— Pisaurensis. - - - Venetian.



12. The type of soundboard commonly used in small early Venetians (and large Pisaurensis).

8. Diagram 10 shows an **early Italian piano** in walnut, made in a harpsichord-shaped case.

There are several later and more complex barrings for the more brilliant roccoco instruments which later, in the eighteenth century, became mixed up with the crossbars. In general the resultant tone was harder and more brilliant for faster music. The harpsichord had lost its beautiful bell-like simplicity of the maple instrument (Photo No. 3A) of about 1510.

9. Early sixteenth-century instruments

All the instruments which have been found which resemble the 1503 in Milan, have been parallel-barred, usually with one bar. So this seems to be the earliest kind of barring and produces a simple, clear, bell-like tone—most distant from the later brittle qualities of the piano soundboards. In Florence there is another single-strung harpsichord in a maple case, but it does not have the tubby profile of what we are calling the 'Venetians'. It is by Joannes Baptista Bertarinus Pisauren, 1577. Diagram 11 shows its plan, drawn on top of the plan of the Venetian instrument in Photo No. 3. (The 'uprights' with partial soundboards may be earlier.) Neither this instrument nor the Hieronymous Bononiensis of 1521 appear to have bars passing under the bridge, but I believe they did not have to be opened up in restoration. I hope they can now be X-rayed.

10. Early, small cross-barred instruments

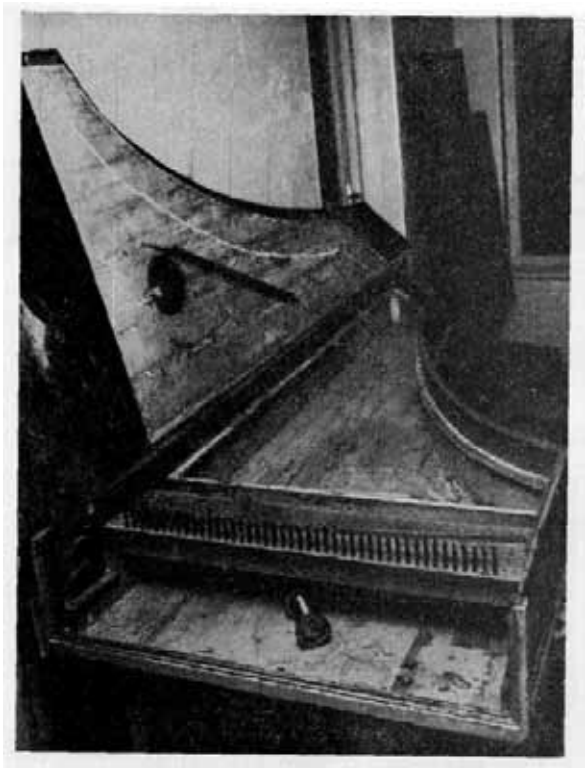
The earliest small cross-barred harpsichords, which I have seen inside, seem to have originated in Brescia and Pisa. For example the small C/E — d''' Dominicus Pisauri of 1553 in Paris and the Dublin instrument with the Pisaurensis nameboard of 1590. However, when I restored the Dublin instrument, I found a signature inside it saying that it had been made by Francesco in 1564. There was a second inscription which said that the 4' principale was added about a hundred years later, but I forget the exact date.

11. Instruments with divided slides

The most interesting of these old Venetian instruments so far discovered is the one found in Sweden, similar to the 1503, but all in maple. This instrument, which has been restored since this article was begun and is now at the Harpsichord Centre, will be discussed in another article on tuning. We need to mention it as a link, because the extra jacks for D sharp and E flat give a slightly different tone colour (of course the more positive the soundboard the less the plucking position matters). This may have suggested contrasted tonal registers to the early makers. These contrasts seem originally to have been achieved with complex bridge arrangements (rather than the lute as we know it), which have, often mistakenly I think, been taken for quint and 4' stops (see R. Russell's description of the upright Weber).

12. The larger Venetian instruments

The large instruments (except for one in the Hague museum which is shaped like the smaller ones) are of a more parabolic shape than the smaller ones,



6. The simple construction, all pine with beech bridge, of the Franciscus. Taken during restoration.

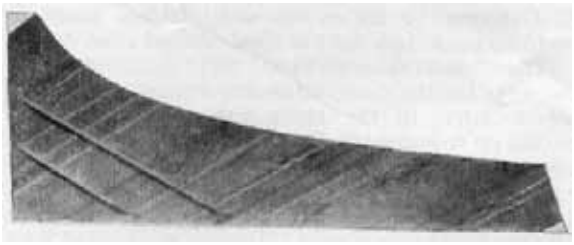
with the bent side forming a more strict logarithmic curve, parallel to the bridge. These larger instruments have a compass of GG (sometimes short octave) or AA at the bottom and go up to c3 or d3. Such large cases would be too sonorous if they were built exactly like the smaller ones and nearly all of them have some factor which increases the harmonics. These factors include bars crossing the bridge, bridges near the edge of the case, cross grain soundboards, close plucking position or wrest planks hollow at the treble to give a second small soundboard with high frequencies. The wrest plank is discussed later.

The Baffo in Stockholm F.MVDLXXXI has a cross-grained soundboard and also three bars crossing under the bridge which will raise the pitch of the soundboard. The Baffo in the Paris Conservatoire MDLXXVIIII has also three bars crossing under the bridge. Both these instruments are entirely made of cypress, which is a very bright toned wood which will augment the brightness of the bars and cross grain. The bridges too are of cypress.

The large undated Dominicus Pisaurensis in a private collection in Paris [GG, (no G sharp) to c3] is the first large instrument I discovered which appears to have a bar parallel to the bridge. This instrument has a small gap of only 3" between the bent side and the bridge. The wrest plank is narrow for such a large instrument (6|") so the plucking position is close. These factors would increase the harmonics.

The complicated problem of sorting out the classes is shown by the fact that many instruments in the pile I bought had had their soundboards cut out and mixed up. Various pieces had been sold to other countries, and dates and signatures are doubtful. Thus at one time I had two virginals, one dated 1770 (an improbability as it had archecembalo-type divided keys) and another dated 1560 which appeared in fact to be late eighteenth century.

There is a very beautiful little double manual signed Pisaurensis in Niirnberg. This instrument is all in cypress, and it is of the small brilliant type with three cross bars and not the 'Venetian' shape. These differences in style and the wide dates between the instruments of certain makers suggest either an extraordinary longevity or that they had the work of other makers ascribed to them, or adopted it, as in the Irish instrument by Francesco with the Pisaurensis nameboard.



7. Taraglia soundboard.

15. Large Venetian with parallel bars

A large instrument, GG to d3, with two parallel bars has just been discovered in Arrezzo. It is signed Taraglia, 1704, Mestre on the case and the top key (Photos 7 & 7a). The bent side is of thin Northern pine *3/16"* and the bottom is 5/8" thick. The soundboard is cross-grained which not only gives the brighter tone but also is structurally logical in a cross-grained soundboard. The brightness in the tone is also enhanced by the small bridge of beech, only .35" x .45", which is well placed in the treble.

This instrument justified my expectation when we found it after eighteen years. It has not only a wide range of blending harmonics but also a better balance in all the registers than the earlier instruments, or indeed, any other Italian I have heard. Again we get a melodic treble.

Last year a very similar instrument made in 1703 by Grimaldi of Messina was found in Paris. The bridge is about 4" from the side and the first bar is about the same distance beyond the bridge. The soundboard is again about 30° to the spine.

7A. The Harpsichord by 'Taraglia', 1704

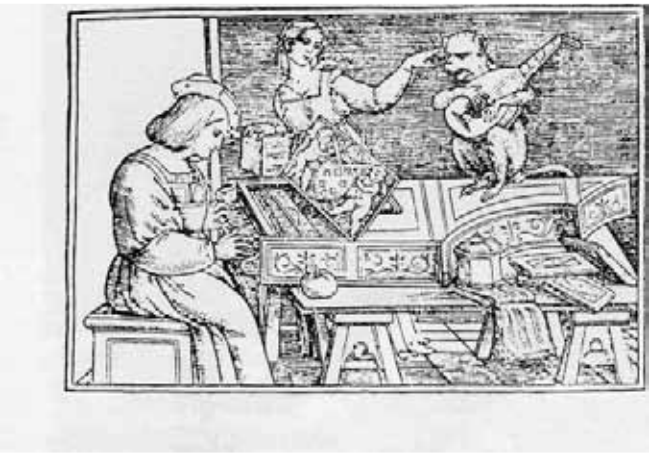
On further inspection, it would appear that the signature on this instrument reads: *A diprimo Aprils 1704 Carianat Torriglio* (or possibly *'Touriglio') fecit Mestre.* It is signed on the case and on the top key.

16. The interaction of ideas between different countries

We have seen that parallel barred soundboards are not only found as widely apart as Mestre or Messina but also in the Franco-English Tisseran of 1710 and English spinets.

The Italian case bracing of both kinds, the knees and the solid braces, are also found in French, English and Northern case construction.

The early 'Venetian' instrument is so called because of the decoration on most of them. However, the shape of the bentside is not unlike that of the early drawing *(c.* 1440) by Arnault of Zwolle (Holland). There is a picture of such an instrument on the title page of music by Andrea Anticho da Montona Chierico, Roma MDXVII.



From Frottole intabulate da sonare organi, Libra Primo. Andrea Antico, Rome 1517.

If we imagine that the gentle angles of the Venetian tail could become curves, as curves appear to have developed from the angles of the Skokloster harpsichord in Sweden and the angular harpsichords in Hungary, then later Swedish and Hungarian casework seems related to the large northern Italian instruments. The actual parallel barring is not found in all these instruments, but it is in the Tisseran 1710, and the English spinets. The English Hitchcock in the V & A and the two French instruments in walnut by Lair (?) must be explored further or X-rayed.

The percussive cross-barring, which is probably later and suitable for part music and the broken style, was also international. It is found in France, not only in unsigned seventeenth-century instruments in Paris but it is thought that both Thibaut and Des Rousseaux may have used them originally. Cross barring is seen in the English Barton 1709 and in a Germanic large harpsichord (unsigned).

We need more research to know whether the archetypes of these instruments were universal and indigenous to the other countries, or whether ideas filtered through from (or to) Italy. Dr. Smith's 'invention' of enharmonic slides or the introduction of leather plectra in England suggest the Italian influence. On the other hand, the advanced development of the Theeuwes in 1567 and the 1623 double from East Coker does not suggest that these other countries were behind Italy, indeed the complexity of the 1622 'Izzard' wrest plank does not seem to have occurred in Italy in the 1740 Cresci harpsichord made in Livorno.

It may just be that the various types of instrument remained closer to the archetypes in Italy, where art, owing to the lack of new ideas from the religious upheavals in other countries, remained rather static from 1600 onwards, but these archetypes may have been universal in the fifteenth century.

17. **The wrest plank and its international character**

The wrest planks show the inter-relationship between the different countries. *Solid oblong wrest planks*

The wrest planks of the smaller instruments C/E are usually oblong 26" x 5|" and made of a hard-wood such as nut. *Tapered wrest planks*

Most of the larger instruments usually have a wrest plank which tapers towards the treble. This is not a major factor in tone production but it reduced the sharp curve at the top of the bentside and helps the placing of the treble part of the bridge on the soundboard, so that it is not so bent and near to the gap. Most of the larger GG (or AA) Venetian harpsichords are of this type. In England the 1623 double manual, the Barton of 1709 and spinets have slightly tapered wrest planks. *Semi-resonant wrest planks*

There is in London the remains of an instrument signed Vido de Trasuntinis, of 1552, on which the wrest plank is only partly solid and partly made up of soundboard wood at right angles to the straight side. The bass of the wrest plank bridge is on solid wood but the treble is just on the hollow part so that the treble of the wrest plank bridge is 'live'.

The 4' Pisaurensis MDXXXXIII in Paris and the Baffo 1579 in Paris both have hollow wrest planks. An instrument recently found in Prague also shows a hollow wrest plank. It is like a Venetian in construction, but the decoration appears to be Austrian. The wrest plank is entirely hollow under the bridge even in the bass, like the Cresci 1740 and the English Izzard 1623.

18. Continuous soundboard to the wrest plank

There is a small instrument of 4' pitch in London with Trasentino 1630 on the outer case. In this the soundboard continues over the jacks in the manner of the Theeuwes. The treble of the bridge is on the free soundboard which is a continuation of the main soundboard. The Dom Pisauriensis 4' harpsichord (MDXXXXIII) has a similar wrest plank.

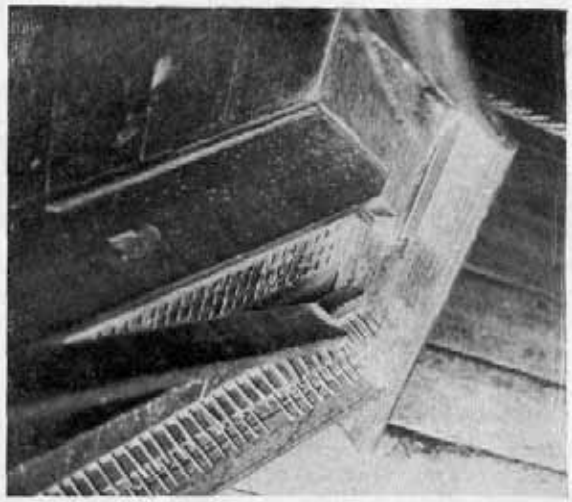
Another instrument, probably Venetian, which may have done this is an instrument (keys missing but probably BB—d3) which is made entirely of Lebanon cedar. The soundboard appears to have been cut back and a lute stop added of the kind formed by a guide nearer to the bridge. This instrument has a very thick bottom (1¾") and a very thin soundboard (.095" approx. in all parts). These factors with the deep case would make it sustaining and gentle in tone and suitable for slower music. The plucking position is very distant in the bass (7") and tenor registers. The wrest plank bridge is strongly curved towards the keys to give a wide plucking position in the tenor. This instrument was probably the most sonorous of all.

This instrument in cedar with a continuous soundboard to give a soundboard on the wrest plank may be related to the 'Pisaurensis' made in cedar, in Leipzig, but I have not seen the latter. So, of course, has the Oslo upright (Photo No. 1).

Neither the 4' Trasuntius nor the cedar instrument has a solid header but a bar under the soundboard at the front just before the jacks, which further increases the roundness in the tone and softens the treble.

The Miiller of 1530 also has a continuous soundboard but in spite of constant visits, I have not seen it myself.

This idea occurs in England in its most sophisticated form with the Izzard of 1622. The wrest plank is a complete box with a secondary soundboard as its bottom which also forms the under jack guide $_x$and continues to the lower header. The upper header is so light that it must be meant to vibrate and activate the lower soundboard. It is removed from its slots in Photo No. 8.



8. The upper header of the Izzard removed to show how light it is. It forms a connection between the main soundboard and a subsidiary soundboard which is also the lower jack-guide. It is doubtful if this improves the treble tone.

The upper soundboard probably continued over the jacks to be a third soundboard formed on the wrest plank.

So far I only know of such a sophisticated arrangement occurring in Italy in 1740 with Cresci, of Livorno or Leghorn. In this, the bass of the wrest plank bridge is in the middle of free soundboard like the Prague harpsichord.

We carefully reconstructed an instrument with a double soundboard in which the wrest plank bridge was entirely on free soundboard. It caused the tone to be loud and immediate but short lived, presumably the two soundboards fight each other being out of phase.

This may be another way in which the early makers tried to change what would have been a gentle tone of the larger early Venetian instruments to make them more immediate in tone. Sometimes they may have done the wrong thing, for soundboards in which the treble is not rigid but only resting on a bar, tend to have a weak, non-sustaining, but mellow treble. Yet this double soundboard may have been intended to improve the treble for it is common in 4' harpsichords. The Taraglia has a really well-proportioned treble and the tone lives up to the expectations, the wrest plank is solid.

19. The musical uses

We have already seen that many characteristics of the construction of these instruments affected the tone. The use of single strings was of help in constructing instruments with more than 12 notes to the octave and may have suggested the idea of contrasted plucking positions in a very early period.

The most famous theorists, Zarlino and Vincento, had archecembali made by Domenicus Pisaurensis and Guido Trasuntinis respectively. The latter is in the Museo Civico in Bologna. The former was brought to England in the eighteenth century but has disappeared.

It would seem natural that such musicians, sensitive to the exact pitch of the notes, and thereby requiring 14, 19 or 31 divisions to the octave would play legato and perhaps slowly to hear the sonorities. Certainly this was the style of the German organists, which was brought to Venice by Willeart. The keys of these instruments are usually long, *I\"* accidentals and If" naturals. Also on some archecembali the notes are widely spaced to make extra room for the strings. (Sometimes the compass, as in a virginal I have, was enlarged up to f3 by using the extra strings for normal semitones and a smaller octave span.)

These large keys would make it possible to play legato even with straight knuckle joints.

Diruta especially states that the harpsichord must sustain. To help the sustaining power of the harpsichord it is necessary to decorate a note (tremoli and accenti). He recommends a study of Claudio (Merula).

A piece of music by Merula, taken at random, La Rolanda, shows such decorations 22 times in the treble and only 9 times in the bass. This confirms that they were aware of the lack of sustaining power in the treble of most harpsichords.

These divisions or ornaments are all smooth harmonic 'filling', beginning on a harmony note. This means they begin on a harmonic of the louder bass and tenor harmony and emphasise and sustain resonances already in the soundboard, as the soundboard is not separated by bars, and the upper divisions mingle with what was already there.

English ornamentation always began (I accept Purcell's table as correct for reasons too long to give here) on a discordant accent and went in comparatively straight lines. The Italian ornamentation between the beats is florid, and if the melody is to go up the ornamentation may well start by going down first to give circular changing note patterns.

The infilling, largely diatonic, adds to the existing harmony but does not often add the extra minor tensions of accental passing notes which we find in later Italian music (as in Zipoli, for example).

The complete picture of smooth music, with the sustaining tenor and lightly strung treble is enhanced by the fingering with the fourth finger on the accent and the third finger on the upbeat. There is not the articulation, the percussive jump which appears to give an accent onto the beat.

The accented discord of the English ornaments amplify this with the English fingering. Willeart and Cipriano de Rore were very conscious of the block effect of the harmony. To play Gabrieli on a Venetian organ in a spacious church makes one more aware of the block effect of the chords than the tremoli and decoration. The organs give this roundness as there are no very small pipes, the fifteenth doubling in length at" c3 and the high registers breaking back sooner. The smooth harpsichords too develop the tone of the chord, rather than the note.

Was Diruta just one school? Was the more percussive fingering also used in Venice? The block chords of Giovanni Picchi are rhythmic and in a dance metre requiring articulate phrasing. Who were the masters of playing in the ballet style? Did they use cross barred instruments like the Dominicus Pisauri (1553) (or the Irish 'Pisaurensis') or did they use the virginals? Certainly the virginals, sometimes with a longer treble scale would give the angularity and rhythmic life of the music of Picchi. The open 5th in the bass would give an 'acoustic' bass to the virginals often lacking in this register.

CONCLUSIONS

1. The 'Venetian' instruments with their peculiar shape may be the most common survivors of an earlier type of instrument, which may have had a wide geographical distribution.

2. They had considerable variation and so far they have been almost completely neglected by historians although of all harpsichords they are the ones most directed towards beauty of tone, and entirely different in conception from the popular view of an 'Italian'.

3. This beauty of tone was sometimes got by having the whole instrument in one wood like the Baffo in cypress, or the Taraglia which is all in pine. The large instruments in the north of the Hamburg-Stockholm school reflect the casework of these instruments, although they may be cross barred to give the angularity for part music.

4. The Spanish instrument recently discovered seems also related but it had a double bent side like the Swedish instruments. But the long tail of the Venetians could easily be transmuted to a bend. The strings are very light.

5. Various other styles of music have required a lingering resonant tone and it would seem that some late seventeenth century French music, in block chords, requires this. The English Tisseran is known to have Venetian barring and as it is so similar to some French instruments it is possible that the two large walnut French instruments and perhaps even the Hitchcock will reveal themselves to have Venetian barring. If so the whole style of playing this type of music will have to be rethought.

Orlando Gibbons seems to pursue *a.* more resonant style than, say, Bull and it is quite possible that he would have had a Venetian harpsichord or a large kind of Venetian virginals with a big soundboard with a recessed keyboard such as existed at that time.

Therefore having done my early experiments on some of the ideas found in Venetian instruments, when I was able to go and look at instruments abroad, I felt that many of the ideas in them could be seen in all the countries linked by the sea in Europe. They may have originated either from the Venetians, or from a common source with them. Although almost entirely neglected to date, they in fact contain many of the more beautiful elements in harpsichord making.