

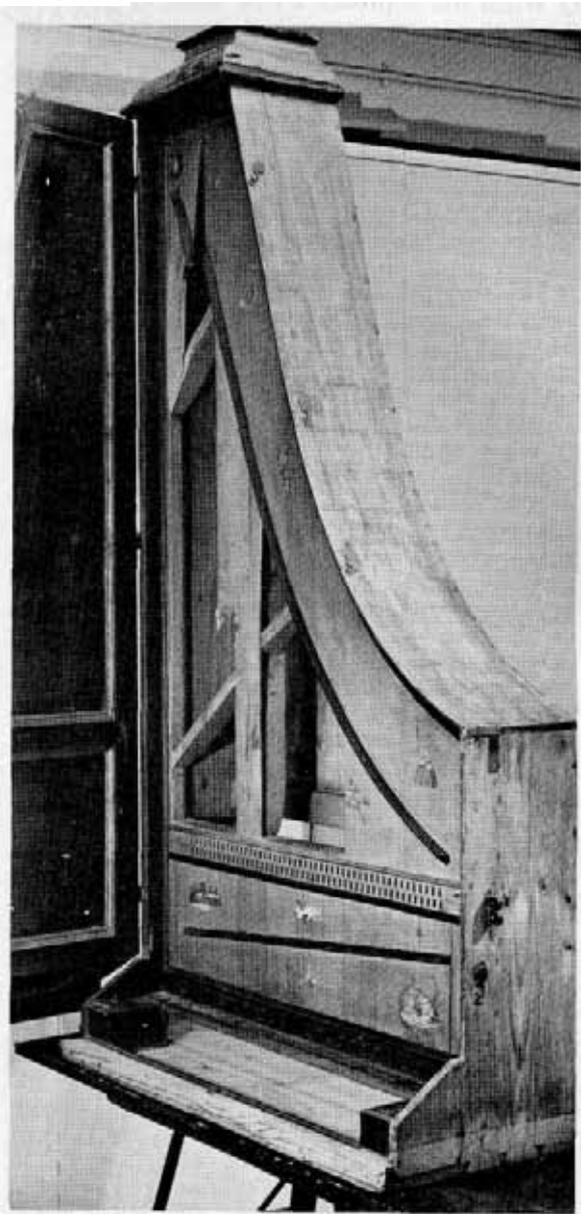
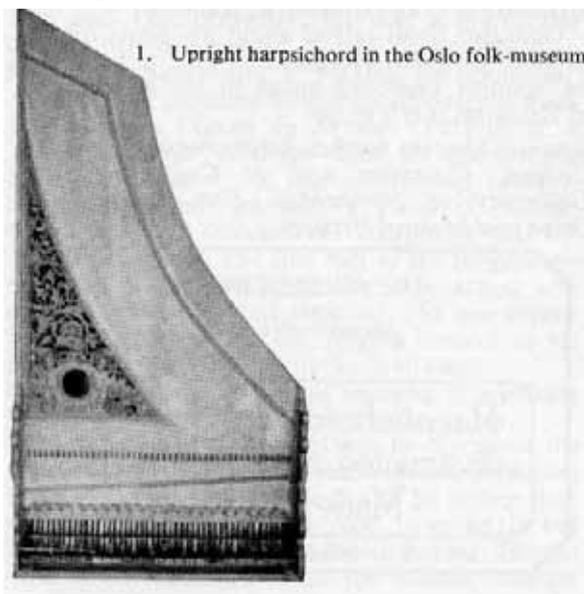
The Upright Harpsichord

by MICHAEL THOMAS

SINCE I first agreed to write an article on the upright harpsichord two articles have appeared in *Early Music* which deal with the subject. The first gives a general survey of the instrument by Dr Van der Meer and the second deals with the early upright in the Donaldson collection. I will therefore only touch on the general history and will concentrate on some specific aspects of which I have gained personal experience by rebuilding, making and playing various clavictheria.

One obvious problem which one finds when one comes to perform on these instruments is the action which can be heavy and unwieldy or light and sensitive. The second interesting problem is whether these instruments were an anachronism when they were made as often their soundboard seem to be constructed in a way which was in common use at a prior date.

The evidence for the latter idea is by no means conclusive. Readers may remember that in the *E.H.M.* Vol. 1, No. 4, p. 110 I put forward the idea that the incomplete soundboard (i.e. a soundboard just around the bridge) was the earliest way of constructing a soundboard to keep it flat and was used before bars for this purpose. This is based on the idea that the clavictherium in the Donaldson Collection is very early and it has to be admitted that there are signs of Franciolini's work in the painting. It has therefore been assumed that the upright harpsichord in the Oslo folk-museum is very early but the larger compass C/E toe and bigger size count against this (Photo 1). So the



2. Upright harpsichord from Maastricht: The Hague Gemeentemuseum (Photo: B Frequin)

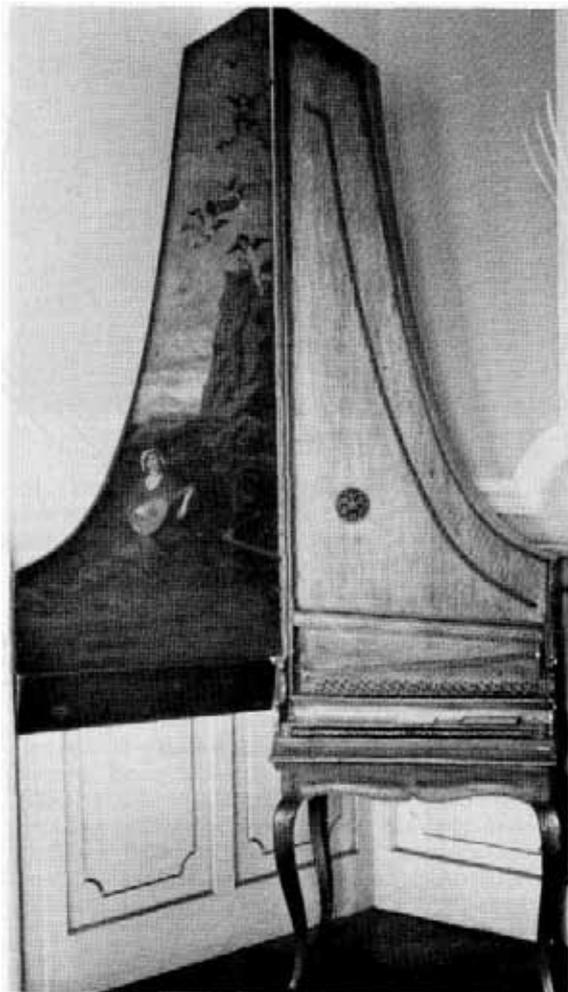
idea that the incomplete soundboard is the earliest cannot be said to be clearly established. If the Oslo instrument is late sixteenth century or early seventeenth century, and the incomplete soundboard is the early type, the anachronism becomes greater. Certainly the other method I gave of forming an

incomplete soundboard (fig. 1) was to have one which appeared to be complete but part of it rested on the frame of the instrument (fig. 2). This system is found in the 1747 upright from Maastricht which does seem very late for such a structure (Photo 2). This same system is used in the harpsichord of Hungarian or Spanish origin in the Courtauld Institute in London which is thought to date from the beginning of the seventeenth-century. That clavicitheria existed before harpsichords seems to have been suggested by Fétis and quoted in Brinsmead's book on the piano. Brinsmead writes that according to Fétis the clavicembalum jack developed from the clavichord tangent with a plectrum glued to it, the tangent later becoming smaller when tongues were added and remaining as the brass spring. Such a crude jack would need a considerable amount of power to make it return. Such power would be given in an upright harpsichord in which the jacks are generally pulled back with considerable force. If the upright harpsichord preceded the horizontal harpsichord it would account for various early traditions of string lengths, size and compass and soundboard construction being still found in them at a later date. This is probably the reason that copies of Arnaut de Zwolle's diagram c. 1440 made in Belgium (Fétis country) are usually made upright. Here I rely on Brinsmead as I have not been able to find this passage in Fétis.

Against this theory is the fact that Mersenne, in 1636, describes the instrument as a new instrument found in Italy (but then he is obviously wrong as we know it existed in Norway.) Also my own interpretation of Arnaut de Zwolle is that it could easily have been a horizontal instrument. Indeed the weights he describes to work the jacks and the keys being pivoted at the back and glued there by bitumen (hinges) as in a positive organ, suggest that his second and third methods must have described a horizontal harpsichord.

If we assume the Donaldson instrument to be late 14th century, this suggests that the partial soundboard was a feature of this period. Arnaut in 1440 (circa) gives a complete soundboard with three bars passing under the bridge and another soundboard below it. As far as I can tell by tapping, the simple upright harpsichords (e.g. Munich and Paris Conservatoire) (Photo 3) are of the common type of Italian soundboard with three bars passing under the bridge, (fig. 4, also E.H.M., Vol. 1, No. 4, page 111 fig. 11). So far as I have not seen the single bar parallel to the bridge (fig. 3) which was a feature of the early Venetian instruments. I have not been able to see inside one but there is no reason to think such instruments did not exist and the Bedard upright is based on a Venetian Instrument.

The nearest thing (of which I know) to the



3. Upright harpsichord in Munich museum

parallel barred instrument is in the Germanisches National Museum, Nürnberg. (fig. 5). (My notes on this instrument are brief but full detailed information can be obtained from Dr Van der Meer's many articles). The soundboard has no hitch-pin rail (boudin) or central bar but just small diamonds in beech to hold the 4' pins into the soundboard. The main bar is beyond the 4' bridge and parallel to it with two bars at right angles to it to mask off the triangle of soundboard that remains. In other words it's like a 'parallel' sound board except that the little triangle on the left is not free to vibrate. There is a large rose between these two bars. The soundboard appears to be cypress in a pine case. There is a large area of free soundboard around both bridges as there is no hitchpin rail for the 4' (no boudin), an arrangement also found in my own late German harpsichord and in the Swedish Bromen (1750).

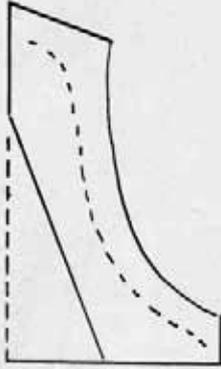


Fig. 1 Incomplete sound board.

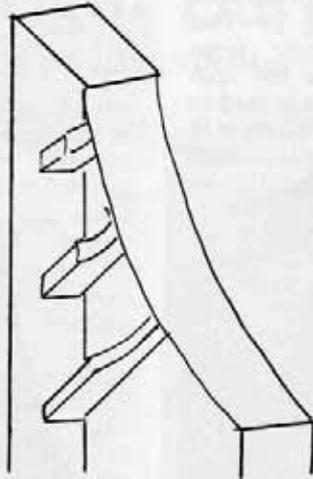


Fig. 2 Soundboard partly masked by solid frame (Delin)

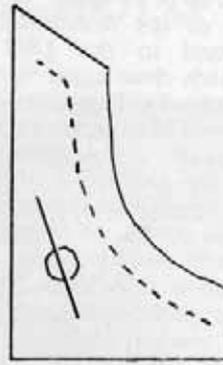


Fig. 3 Italian single bar

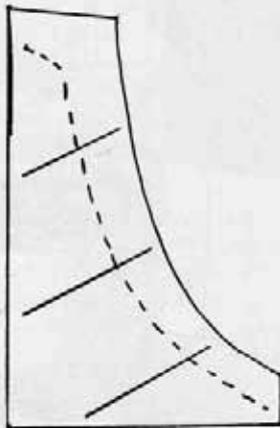


Fig. 4 Italian cross bars

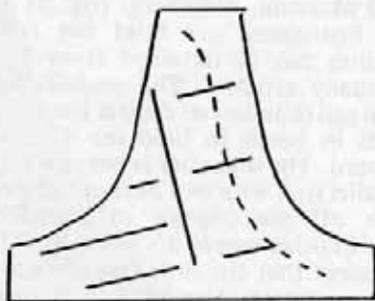
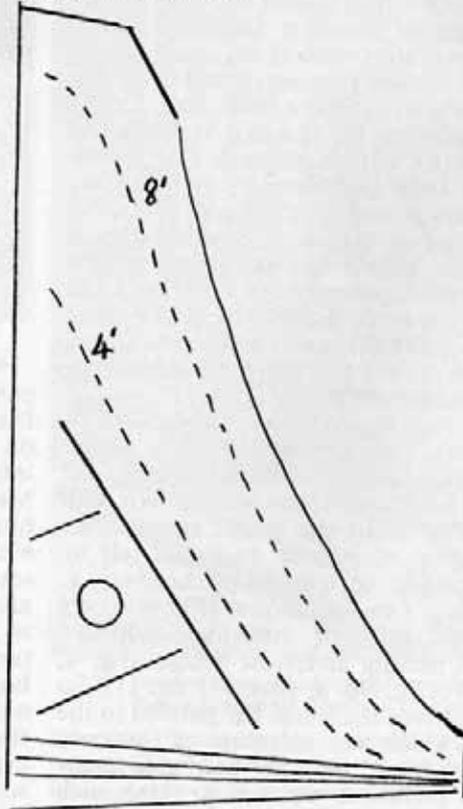


Fig. 6 Irish upright with additional cross bars

Fig. 5 German upright almost free sound-board. Two masking bars

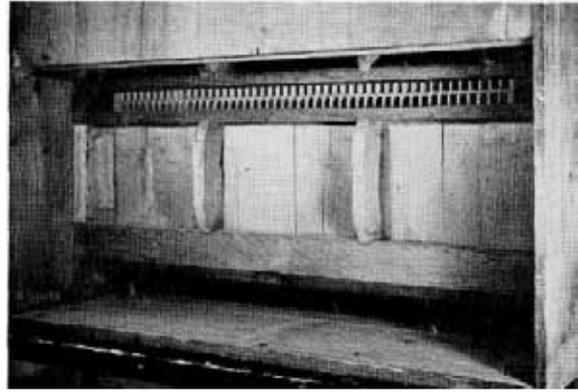


However, this too is really an anachronism as this arrangement was common in Venice at the end of the sixteenth Century.

The German upright has the same arrangement of three eight-foot stops on two strings as the 1746 Weber and many other earlier instruments including the 1537 Miiller. The jacks fan out (6" and 1 1/2") in a way which is found in several German instruments including the 1720 Carl Conradt Fleisher in which they slope backwards (10 1/2"), and the instrument in the Courtauld Institute, London. In the German upright they



4. Upright harpsichord by Henry Rother 1774 at the National Museum, Dublin



5. Hollow wrest-plank of instrument from Maastricht (Photo: B. Frequin)

also divide between the treble and bass (this does not mean it's Spanish!) The tail is truncated in the same way as the Courtauld harpsichord.

The interesting point about the guides of the Nurnberg instrument is that they fan out to five the maximum tonal contrast being 1.3", 6" and 7.7" away from the 8' bridge at the bass. This contrasts with the Irish Weber instrument discussed below in which two of the three 8' registers seem to be made to pluck the strings at an almost identical length. The soundboard of the Irish Weber is very similar because there is no 4' to need a boudin. There is a possibility that there were also little bars passing under the bridge. We are just about to make a fuller examination on this soundboard and I will write a note when I have more definite information.

The Rother harpsichord 1774 (Photo 4) also made in Dublin was definitely of this kind of construction (fig. 6). It was a standard 'Ruckers' type soundboard with a 4' boudin as the main bar and another bar running parallel to the 4' bridge with small masking bars masking off the triangle. So far it was quite usual but the interesting feature was that there were three small bars under the 8' bridge and this was the last British example (1774) of these cross-bars as far as I know. Indeed it was made fifty years after this practice had ceased in England. However, in France in 1774 Erard was using little cross bars to keep his thin flexible soundboard flat.

As I have already mentioned the upright harpsichord from Maastricht (Photo 2) was still using the incomplete soundboard in 1747. Another interesting point about this instrument is that it has a hollow wrestplank (see Photo 5) in which the supporting struts do not touch the wood under the bridge, a feature found in the English 1622 harpsichord. It is true that in 1740 Cresci Pilaso of Levano was still using a hollow wrestplank like the early Baffo's but this was a very archaic



6. Late Delin (undated): The Hague Gemeentemuseum (Photo: B. Frequin)

instrument.

The best known uprights are by Delin in Brussels and in the Hague (Photo 6). Some years ago two well-known players and I were sent to record the instruments in Brussels. We were to record the upright Delin on which the slides are divided and came rather inaccessibly through the sides. One of us was working the bass side and I worked the treble side while the third played. This player told us that every time she nodded her head she wanted the stops changed. However utter chaos followed as she appeared to nod her head for every beat!

The Delin soundboards (fig. 7) are very interesting because they get the bright tone which the makers of upright harpsichords seem to be trying to reach, by limiting the soundboard in a different way. Although there is no 4' there is a heavy boudin which is bent like a 4' hitch pin rail. This is supported by another solid straight piece of wood which runs underneath it from the straight side to the header. The result is the effect of the 'incomplete soundboard' which may be considered an archaic feature. When I examined the Delin 1768 of Mr Martinod in Paris and later when my assistant Mr West revoiced this instrument for Mr Gilbert, he examined and confirmed this. Limiting the soundboard in this way by a heavy boudin and perhaps even by beech in a later instrument gives an immediate brilliant effect in the tenor. I

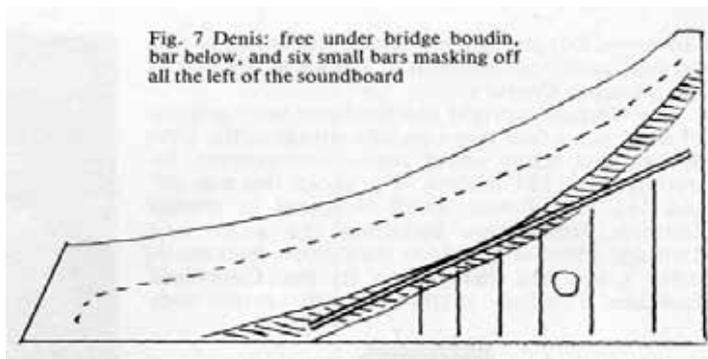


Fig. 7 Denis: free under bridge boudin, bar below, and six small bars masking off all the left of the soundboard

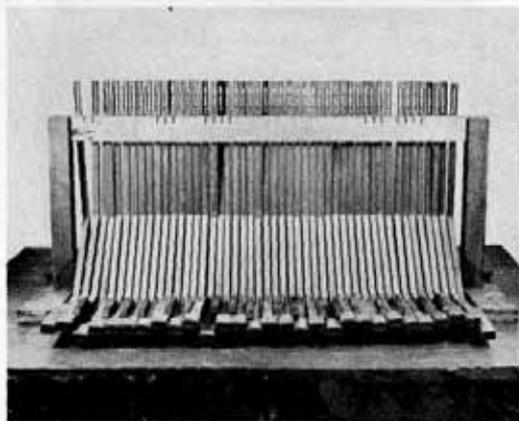
suggest that this may have been a revival of the old custom of having an incomplete soundboard which seems to have been particularly preserved in clavicytheria.

The compass of upright harpsichords is often

7. Key of Primary action (Maastricht harpsichord) The Hague Gemeentemuseum (Photo: B. Frequin)

Fig. 8	Compass
Arnaut (1440) upright (?)	B-a ¹
M. Mersenne 1635	(3 octaves)
Praetorius 1619	19 notes
Munich upright	C/E-c ¹
Olso upright	C/E-c ¹
Martin Kaiser (1700?)	GG-c ¹
German upright (1700?)	C/E-F
M.C.H., The Hague 1747	C-c ¹
Weber 1740? 1760?	GG-g ¹
Rother 1774	(5 octaves)
Woffington 1785?	FF-g ¹
Delin, The Hague	GG-F
	AA-F

7A Action of the same



very small for their time (see fig. 8). Thus Delin

The diagram shows the action of the Rother which works very well. Sometimes in the smaller instruments such as the early instrument in the Deutches Museum, Munich, very small stickers are employed to connect the keyboard to the square and it is difficult to see why they could not have been all made as one (see Photo 11). On



11. Action of the upright at Munich. There are small sticks about 1" long between the key and the square.

the contrary the big instrument in Niirnberg has the fundamental simple action with flat pieces of wood coming up from the key carved with a sort of hook on them which interlocks with the tail of the jacks which are then pulled back by gravity.

It is surprising to find the simple action in such a big instrument but with four rows of jacks fanning out it is difficult to say what the leverage should be anyway. It is 1:1 for the middle of the rows of 8 jacks. This does not make the parts unduly long. The tendency for the square to move in an arc is to some extent compensated by leaning the uprights backwards. This is one of the great problems with upright actions. The squares move in the arc of a circle. Sometimes a pad is used to push the jacks forward which are controlled by double guides. This produces a lot of extra resistance as the pad is moving in the arc of a circle and is slipping at the bottom of the jack. A much better way is the hooking method described above which needs no under jack-guide. Another successful and common method is to have the top of the square built like a cage which contains the tail of the jack and not only acts as an under jack-guide but both pushes and pulls. The movement is usually achieved by a small pin going across the cage and the jack sits on it with a small notch on its side.

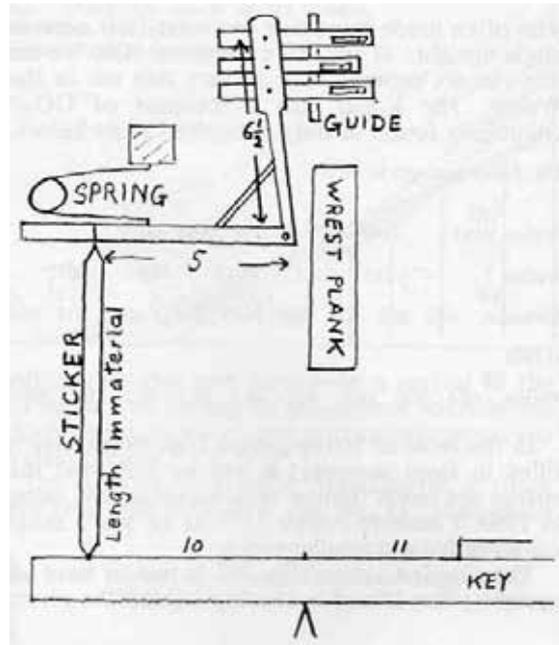


Fig. 11 Secondary action + spring (Rother) Leverage - $2x \wedge = 5:6$

This double action (separate keys and squares connected by stickers) can be made to work like the first simple method just by gravity and this is probably the best way. Although some instruments, like the Rother, have pallet springs on the back of the square to assist return (fig. 11). One variation of this method is to put a roller between

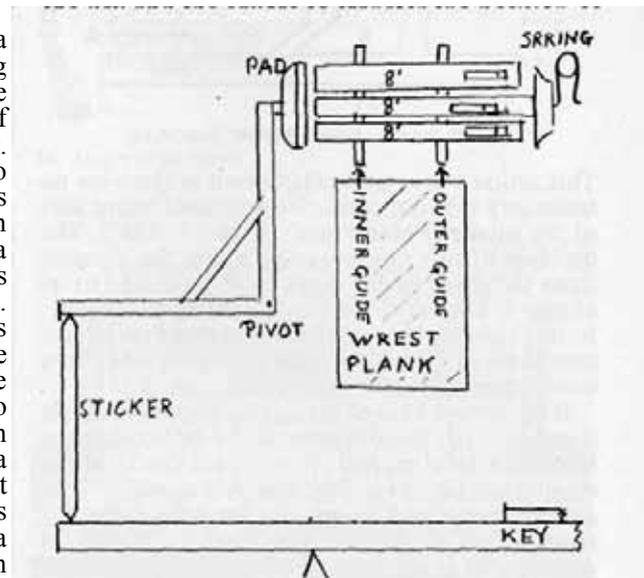


Fig. 12 Third system activated by spring onto middle jack. Two guides.

the key and the square to transfer the position of

the strings. In this way the largest strings come central as in the Kaiser instrument in Vienna. When I had to complete the Woffington of Dublin the keys existed with holes for stickers. I ran these stickers to quite small organ squares. To the tail of each jack I glued an organ wire which had two buttons on it, one to push the jack forward and one for the return. I also put buttons on the stickers in the same way. So it was possible to use a very small accurate square and still get a gravity return. This method seems very successful although in this particular instrument the original leverage of the keys, the pivots and the levers to the organ, which went behind it, are all very poor. Nevertheless the harpsichord part behaved very well for several recordings.

A third type of action is when there are three separate moving parts — the key, the square and the jacks (fig. 12). The jacks are linked together so that they are independent from the square and returned by the middle jack, which has a large head to push the others back. This head has a pallet spring going to it. This method not only has the disadvantage of the pivoting pallet giving extra resistance (see above) but the force from the spring at one end, and the finger at the other, are directed at opposing ends of a system with four sliding parts. These parts are also pushed sideways as they are under continual stress and the resistance is enormous. The action of the Upright Weber works in this way and when I restored it I found it impossible to get it to work freely. Previous restorers had covered the jacks with black lead to lubricate them and what I took to be the oldest jacks had been cut out hollow. This did not help as the problem is not one of weight.

There is some doubt as to the date of the Weber. Russell gives the date as 1775 but Boalch says that the date 1764 was found pencilled on the back of the soundboard during repairs in the early 60's. These repairs were necessitated as the instrument had become shockingly damp, but were very nearly disastrous. I am told that the repairers wanted to put in a new soundboard! Luckily the owner prevented this but it is not quite clear whether the soundboard has been interfered with as the tone has deteriorated enormously. I am hoping to restore it fully in the near future and hopefully I will have the opportunity of clearing up the mystery of the date. I have always thought it to be much earlier than 1764 as the casework is far more teutonic than Weber's other instruments and that suggests that he built it soon after coming to Dublin from Germany. Also it has 3x8' stops on three strings. Use of 3x8' strings is found in Germany, as we have stated, in the instrument by Hass in Copenhagen and the Braumen in Stockholm. It also occurs in a number of Venetian instruments (Fitzwilliam Museum, Cambridge;

Claudius Collection, Copenhagen) and in the Swiss double manual described in E.H.M. Vol.2, P. 40. I don't know of any English instrument of 3 x 8' on separate strings after the 1622 at Knowle. The Weber of 1746, which I also restored, has 3x8' stops but like the Muller of 1537 and the Hayward of 1683 they act on two strings. There are only two pedals to the 1746 instrument and they probably acted in the following way (fig. 13).

Fig. 13	
LEFT PEDAL	RIGHT PEDAL
Lute	Middle register
Nothing	Nothing
Principal 8'	Harp
Possible arrangement for three eight-foot registers on two strings. Both up gives the maximum: both down, minimum. The right pedal can be used as a swell	

Three strings are not much louder than two so the 1746 system seems a much more viable and flexible one, and would therefore seem to postdate the system on the upright.

In the German upright in Niirnberg the 3 x 8 contrast each other because of the plucking position but the Weber instrument has two 8' plucking at virtually the same position fairly close to the bridge. The nearest jacks obviously will pluck in this position but the middle row of jacks, which must go in the middle as they activate the outside ones, have the low tongue to pluck the strings of the low bridge. This low bridge is just about the width of a jack guide nearer the strings than the other so the plucking position becomes the same. There is no extreme stop like a lute.

What can be gleaned from this? Perhaps that while there were a few soundboards of the resonant hollow type in Italy and the German upright, most soundboards of upright harpsichords were of the incomplete or heavily masked type. This may be due to the fact that 'roundness' of tone is automatically added when one is facing the soundboard, but if these instruments tended to be archaic, it suggests that the earliest way of stiffening a soundboard was to limit the size.

All sorts of other features are found at later dates in the uprights, the G compass, the small compass, the eight-foot strings, the registers coming through the side, cross-grained soundboards in 1751, hollow wrestplanks in 1747. The Italian hollow soundboard was usual in the first half of the sixteenth century, yet it appears much later in the German upright. The bars under the bridge are usual in France, England and Italy in the seventeenth century, yet they still appear in 1774 in Ireland.

Does this mean that the makers of uprights were more adventurous in an esoteric way? Mersenne says 'you can make an infinity of other sorts of spinets'. Perhaps these other sorts of

spinets had roots in antiquity before the harpsichord became standardized in, say, 1500. This would account for the variation found, that we see echoes from partially lost traditions.

It seems wrong to believe that the string gauges, compasses, construction are all the same at a particular date for all instruments. Not only were there currents of opinion across Europe, but each instrument had its own tradition. I have already said that I believe virginals often followed contemporary harpsichords in pitch, compass and as far as possible, string length. But there are many virginals which are more difficult to explain. The virginals, spinets and upright harpsichords had their own traditions. They could be, as in the time of Arnaut, of no fixed pitch and of a size and shape to suit the performer. The harpsichord, so often used as a continue instrument, had to have the pitch of the cornets and the necessary compass for the continue. By comparison it is a contrived

and mathematically worked out instrument from Pythagorean principles. Really, by saying nothing, Mersenne tells us a lot.

Let us compare the compasses of the instruments in Praetorius, 1619.

Little spinet: C/E-a² Square Spinet:
C/E-d³ Upright Spinet: C/E-c³
Positive: C-c³ Pentagonal Spinet:
C/E-f³ Pentagonal Clavichord: C/E-
f³ Little Clavichord: C/E-a² Other
Positive: C/E to c³

The last, which is probably that of the harpsichord, is of course, the most common.

So perhaps it is this sense of freedom in the upright, this meeting of schools and dates, and indeed sometimes anticipating, that gives it its great appeal.

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