



Fig. 1: Angel with Clavicytherium from Kefermarkt Altarpiece

# An Early Clavicytherium Reconstructed

by Peter Bavington

St. Wolfgang's Church in Kefermarkt, near Freistadt, Upper Austria contains an elaborate three-part altarpiece in carved lime-wood, which was completed and installed in 1497.<sup>1</sup> The central panel is dominated by the life-size figures of St. Peter, St. Christopher and the patron St. Wolfgang. On the sloping underside of the bracket which supports St. Wolfgang is a consort of angelic musicians including one who is holding a tiny clavicytherium - the earliest known representation of an upright harpsichord (Fig. 1).<sup>2</sup>

The instrument is being played with one hand in the style of a portable organ; moreover bass and treble are reversed, the lowest notes being at the right-hand end, away from the player, a feature also seen in some representations of portatives. No detail of the action is shown but the presence of a large rose, with indications of strings (arranged in pairs as on a spinet) leaves no doubt that the original object is a stringed instrument and not an organ.

The Kefermarkt altarpiece, having been ravaged by woodworm and other disasters, was on the point of collapse and had to be extensively restored in 1852-55. I have been unable to discover any precise record of what was done at that time: however it is certain that many details were recarved. A question-mark therefore hangs over the authenticity of the clavicytherium: could it have been originally a portable or perhaps a psaltery?<sup>3</sup>

Documentary evidence of the existence of the upright harpsichord in the fourteenth and fifteenth centuries is scarce and problematical. There is no mention of such an instrument in Arnault de Zwolle's celebrated treatise of c. 1440.<sup>4</sup> Paulus Paulirinus, writing in c.1460, describes an intriguing instrument which is a combination of vertical harpsichord and organ.<sup>5</sup> This is actually the only fifteenth-century reference I have been able to trace; however, much earlier, in 1388, there is a letter of King John of Aragon which refers to 'an instrument similar to an organ which sounds by means of strings', possibly referring to an early portable-like clavicytherium?

These traces are so few and slight that, given the uncertainty over the Kefermarkt carving, the early clavicytherium would probably be thought of as a rare and fabulous oddity, of no real musical interest, were it not for the fact that one has survived. This is the clavicytherium in the Royal College of Music Donaldson collection, which has been reliably dated to c. 1490 and which is therefore the oldest known stringed instrument in existence.<sup>7</sup> It is of South German origin and incorporates (in the lining of the back) a fragment of a lease contracted around 1450 in Ulm - some 200 miles from Kefermarkt. As Elizabeth Wells has pointed out,<sup>6</sup> the workmanship is confident and suggests an established tradition rather than an experimental instrument.

When I first studied the R.C.M. instrument it occurred to me that its

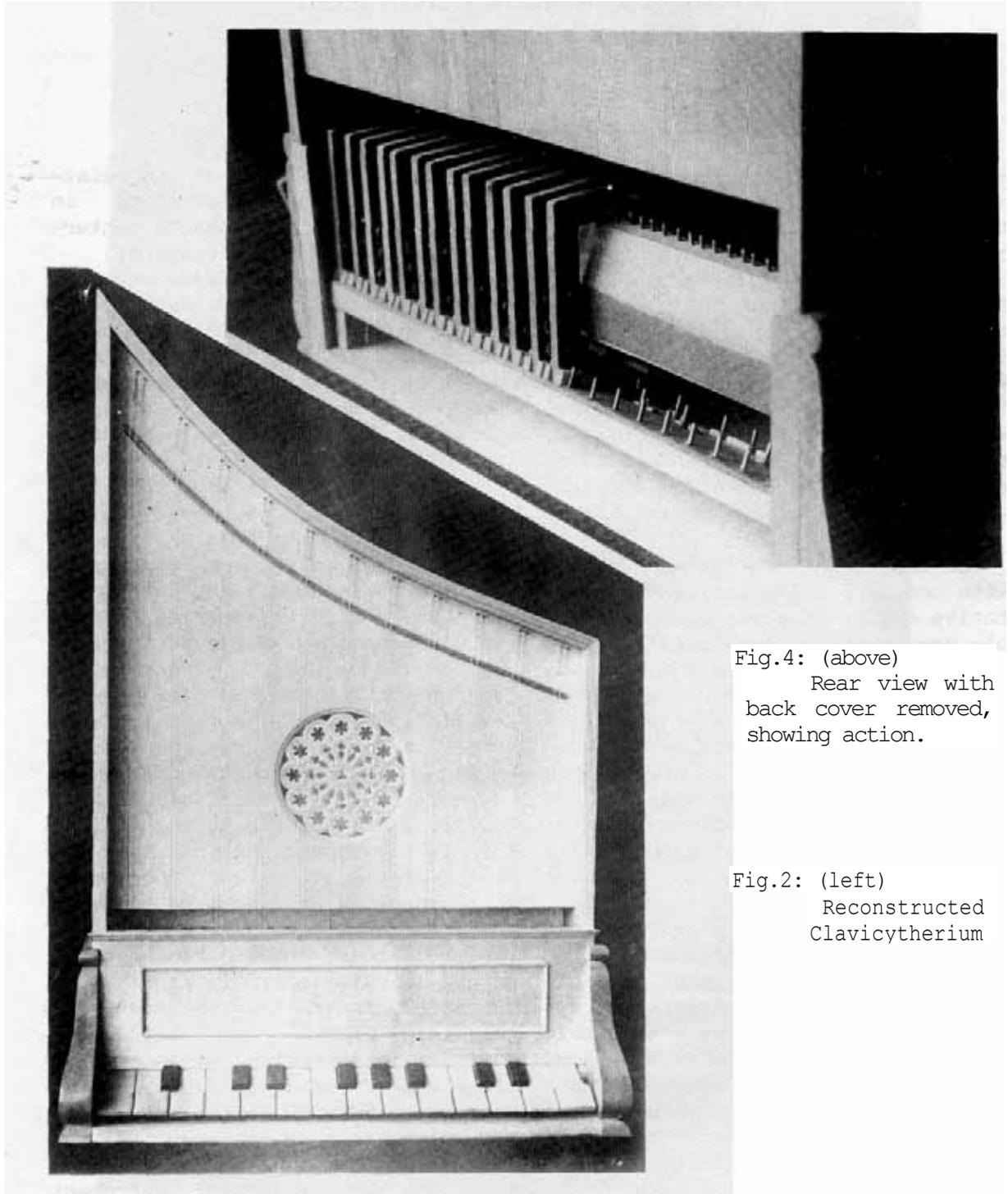


Fig.4: (above)  
Rear view with  
back cover removed,  
showing action.

Fig.2: (left)  
Reconstructed  
Clavicytherium

existence might be taken to support the genuineness of the Kefermarkt clavicytherium. Here we had two early stringed keyboard instruments, closely contemporary and from the same region, both uprights and markedly similar in general appearance, both having a comparatively shallow case without mouldings and an elegant point at the bass end instead of the more usual tailpiece. Even if the carving had been replaced in 1852, it was a fact that by that date the harpsichord (with its soundboard rose) would have been a mere memory and its upright form, never widespread, probably quite unknown. I had no reason to doubt the good faith of those who undertook the restoration; presumably they would have done their best to copy what was left of the original carving. If they had, indeed, been obliged to resort to pure invention, was it not surprising that they had come up with something so similar to the RCM instrument.

Unable at that time to visit Austria to investigate further, I decided to make a small clavicytherium based on the Kefermarkt carving, in order to discover whether such an instrument could have existed and what it would have sounded like if it did. The result is shown in Figs. 2 and 3.

The instrument was made at the London College of Furniture, where I had the benefit of Lewis Jones's encouragement and advice. General shape and layout were derived from measurement of a photograph of the Kefermarkt altarpiece. However not every detail of the carving could be reproduced exactly; for example, a strict scaling-up would have produced sides of over an inch thick, which seemed excessive for such a small instrument. Yielding (somewhat reluctantly) to sensible advice, I put

bass and treble in their usual positions to avoid discouraging those modern musicians who might wish to try the instrument. Details missing from the carving, such as the action and tuning arrangements, were freely adapted from the R.C.M. instrument.

A decision had to be made about the compass of the reconstruction, and the inter-related questions of octave span, size and pitch. The carving shows 22 strings arranged in pairs. Only a few keys can be seen, all naturals. At the size shown there would be room for perhaps 18 of them in all, but they are actually far too small in proportion to the angel's hand.

The main consideration in determining compass and pitch for the instrument ought to have been the music that it would have played. Unfortunately, although we know from numerous representations that very small harpsichords and clavichords were in use in the fifteenth century, we lack firm evidence as to their musical role and repertoire. The earliest surviving collections of identifiable keyboard music (the Robertsbridge and Faenza codices and the Buxheim Organ Book) generally require a greater compass than can possibly have been provided by tiny, portable instruments such as the Kefermarkt clavicytherium.

Taking a hint from the one-hand method of playing, I surmised that the instrument might mainly have been used for single lines, either solo in mediaeval fashion or as part of an ensemble. A compass of 22 notes g-f" without g sharp was eventually chosen, on the grounds that it would accommodate the top part in Burgundian music and in the English fifteenth-century carol repertoire. A fair number of complete keyboard solos from the period can also be played, particularly if transposition by a

fourth or a fifth is accepted: for these one places the instrument on a table plays with both hands in the usual way. Both these ways of playing - one-handed and two-handed - are illustrated in contemporary representations of portatives.

This 22-note compass fitted in well with an octave span of 7 inches (similar to the R.C.M. instrument) producing an instrument some 25% larger in relation to the human body than the one held by the Kefermarkt angel (assuming him to have been a being of natural human size). There is room for a reasonable scale for iron strings in the treble, but the proportions derived from the carving result in quite severe foreshortening on the lower notes, so to maintain sonority these were strung in brass.

The action, which is similar in principle to that of the R.C.M. instrument, is shown in figure 4. It consists of a pillar mounted on the rear of each key which carries at its top a very short version of the usual harpsichord jack, with its pivoted tongue bearing the plectrum in the usual way. All three parts, key pillar and jack, are rigidly fixed together. When a key is pressed, it rocks about its pivot point, and the jack moves forward in a gentle arc and effects the pluck. Brass guide pins are set between the keys at the rear to prevent them from slewing sideways. A second set of pins is set into the top of the wrestplank, comb-fashion, one on either side of each jack, to control the lateral position of the jacks. Since the length of key projecting in front of the pivot point is so much greater than the rear part, it proved necessary to attach lead weights to the pillars to make the keys fall back. Once this was done, the action proved remarkably easy to adjust and very

reliable even in florid passages.<sup>9</sup>

The slope of the keyboard is a feature of the carving and is also found in some representations of portatives; possibly it was thought to facilitate playing in the one-hand position. In order to enable the keys to be removed easily for voicing etc. I found it necessary to reduce the amount of slope somewhat compared with the model.

The sides of the instrument are of spruce, as are the soundboard and backboard. These are glued to a single wide liner, also of spruce (see fig. 5). The rose is of sycamore and vellum, the design being derived from the carving (with some elaboration). The lower part of the instrument is of sycamore, including the two shaped brackets (the ancestors, perhaps, of those found on Italian harpsichords). The keys are covered with holly and cherry.

The instrument proved remarkably loud for its size, with a bright sound akin to that of a small wire-strung harp. Within its small compass there are three distinct registers: a wiry 'lute-stop' effect in the extreme treble where the plucking point is of necessity close to the nut, giving way to a rounder, more ringing mid-range and in the lowest four or five notes a boxy "twang" assisted by the air resonances of the soundbox.

The ethereal harp-like effect is enhanced by the absence of any dampers. There is no convincing evidence of their use on stringed keyboard instruments before the sixteenth century (the traces of dampers on the R.C.M. instrument are probably not contemporary). I was surprised to find, however, that some degree of articulation is possible when playing the instrument due to the fact that the plectrum on its return past the string damps it to some extent.



Fig.3: Instrument and maker, showing one possible playing position.

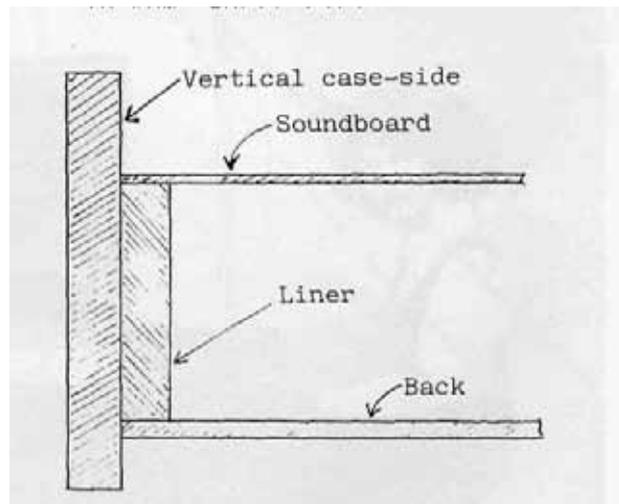
Authenticity cannot be claimed for this reconstruction which, as will be seen, is largely the result of guesswork and invention. However, I think I have shown that an instrument like the Kefermarkt clavicytherium is not intrinsically implausible. I hope also to have provided a further resource for the musician of today aiming to recreate the music of the fifteenth century and before.

#### NOTES

1. For an account of the altarpiece and its nineteenth-century restoration see F. Oberchristl: *Der Gtitscher Flugetaltar zu Kefermarkt*, Linz, 1923.
2. Photograph reproduced by kind permission of the copyright owner from Dr A. Buchner: *Musical Instruments - as Illustrated History*, published by Octopus Books, London, 1973
3. One authority states positively that the clavicytherium is a replacement added in the course of restoration, see J.H. van der Meer

'A Contribution to the History of the Clavicytherium<sup>1</sup> in Early Music, April 1982.

4. For a brief account of this MS see John Lester: 'The Musical Mechanisms of Arnault de Zwolle<sup>1</sup> in EHM October 1982.
5. See S. Howell: 'Paulus Paulirinus of Prague on Musical Instruments' in *Journal of the American Instrument Society*, Vol V/VI, 1979/80
6. For the original text see the Appendix to E.M. Ripin: 'Towards an Identification of the Chekker<sup>1</sup> in GSJ XXVIII, April 1975.
7. For an account of this instrument see Elizabeth Wells: 'The London Clavicytherium<sup>1</sup> in Early Music, October 1978.
8. Ibid.
9. For a further discussion of clavicytherium actions see Michael Thomas: 'The Upright Harpsichord<sup>1</sup>



in EHM, April 1979.

Fig.5: Section through soundbox, showing wide liner supporting both soundboard and back.

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