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For Ronald Hepburn, professor of Moral Philosophy at the University of Edinburgh,  
1975–1996

## The apotheosis of Merlin

Michael Latham

In the eighteenth century, the two instruments we rigorously distinguish today as the harpsichord and the piano were appreciated alongside each other as two sorts of harpsichord, one with plectra, the other with hammers. This is demonstrated by the music practice at three important European courts, those of the Medici in Florence, of Queen Maria Barbara of Spain and of Frederick the Great of Prussia.

In Florence at the beginning of the eighteenth century, Grand Prince Ferdinando de' Medici, himself a keyboard player, collected a variety of musical instruments, both old and new, including a considerable number of harpsichords with quills, *cembali a penna*.<sup>1</sup> The prince, who employed Bartolomeo Cristofori as his curator of musical instruments, also owned a number of harpsichords with hammers, the *cembali a martelletti* for which Cristofori became famous.<sup>2</sup> The prince is known to have given at least one of these exciting new instruments away as a gift. In a letter dated 17 June 1709 Cardinal Ottoboni thanked Prince Ferdinando for the 'rare harpsichord, which is my favourite'.<sup>3</sup> The cardinal's court in Rome was known for its rich musical life.

In the mid-eighteenth century Queen Maria Barbara of Spain, herself a highly accomplished keyboard player, owned at least twelve *clavicordios*, some with plectra (*de pluma*), others with hammers (*de piano*).<sup>4</sup> Three of these she

1 Giuliana Montanari, personal communication, January, 2004. See also: Giuliana Montanari and Pierluigi Ferrari, 'Presenza del pianoforte alla corte del Granducato di Toscana, 1700–1859: uno studio documentario, con riferimenti alle vicissitudini di clavicembali, spinette e spinettoni', *Recercare* VII, 1995, 163–212 and *Recercare* VIII, 1996, 59–156.

2 See: Giuliana Montanari and Pierluigi Ferrari, 'Giovanni, Giuseppe e Filippo Ferrini: cembali della corte del granducato di Toscana. Uno studio documentario', in: Pio Pellizzari (ed.), *Musicus Perfectus, Studi in onore di Luigi Ferdinando Tagliavini "Prattico & Specolativo"*, nella ricorrenza del LXV° compleanno, Bologna 1995, 29–47.

3 '... raro cembalo, che mi ha favorito'. The letter is published in: Leto Puliti, 'Della vita del ser.mo Ferdinando dei Medici granprincipe di Toscana e della origine del pianoforte: cenni storici. Memoria letta nell'adunanza del dì 7 dicembre 1873', *Atti della Accademia del R. Istituto Musicale di Firenze* XII, 1874, 92–240. I am grateful to Giuliana Montanari for drawing my attention to this source.

4 The list of twelve keyboard instruments owned by the Queen and appended to her will was discovered by Ralph Kirkpatrick. It is now in the library of the Royal Palace in Madrid, signature: VII E 4 305, fol. 228r to fol. 231r and is given in full in the original Spanish in: Ralph



described in her will, drawn up in 1756, as her 'best'. One of the three had hammers, 56 keys and was built in 1730 in Florence by Giovanni Ferrini, Cristofori's pupil. The second had plectra, also 56 keys and was built between 1746 and 1756 by Diego Fernández who, although not yet officially appointed to the court at the time, was effectively the royal instrument maker.<sup>5</sup> This instrument by Fernández was unusual in that it had foot pommels, ten in number, for selecting from the five different stops and the four sets of strings. The third of the queen's best instruments, almost certainly made by Fernández as well and probably no earlier than 1748, had plectra, two sets of strings and 61 notes. In her will Maria Barbara bequeathed these three instruments to Carlo Broschi, the castrato better known as Farinelli. From the year after the queen's accession to the throne in 1747 until her death in 1758, Farinelli had served her as director of the magnificent and extravagant operatic productions held at court.<sup>6</sup>

The quilled harpsichord with the foot pommels was designed by Farinelli together with its maker Fernández. In Giovenale Sacchi's biography of Farinelli, written in 1784, we read:

The queen, casually talking with Farinello, said that she would have loved a harpsichord with more varied voices; she asked him if he had seen such a one. He answered no. Then, without saying more, he left the queen and consulted Fernandez, whose talent he knew, and together they designed one. The work being finished, Farinello let the queen find the instrument in her rooms as a surprise.<sup>7</sup>

Domenico Scarlatti was also at the court in Madrid. He had been Maria Barbara's keyboard teacher already since 1719 when she was eight years old and moved with her to Spain in 1729, the year of her marriage to the Infante of Spain, the future King Fernando VI. Scarlatti remained the queen's teacher until his death in 1757 and must surely have at least approved the acquisition by Maria Barbara of both harpsichords with hammers and harpsichords with plectra. The two sets of manuscript books of Scarlatti's sonatas known today as 'Parma' and 'Venice' belonged to the queen and appear to have been copied out for her. These she also bequeathed to Farinelli in her will.

Kirkpatrick, *Domenico Scarlatti*, Princeton 1953, 361. From the list it is clear that the word *clavicordio* meant both the quilled and the hammered variety of harpsichord.

5 See: Beryl Kenyon de Pascual, 'Diego Fernández – harpsichord-maker to the Spanish royal family from 1722 to 1775 – and his nephew Julián Fernández', *The Galpin Society Journal* XXXVIII, 1985, 35–47.

6 Farinelli's will and the inventory of his instruments are both given in full in the original Italian in: Sandro Cappelletto, *La voce perduta; vita di Farinelli evirato cantore*, Torino 1995, 209. The first biography of Farinelli is: Giovenale Sacchi, *Vita del cavaliere Don Carlo Broschi*, Venice 1784. Sacchi describes two of the instruments owned by both Maria Barbara and Farinelli: the piano made by Ferrini and the special harpsichord with registers designed by Farinelli and made by Fernández. See: Sacchi, *Vita*, *op. cit.*, 47–8.

7 'La Regina a caso parlando con Farinello disse, che avrebbe amato un cembalo di più voci diverse, e l'interrogò, se ne avesse veduto alcuno. Rispose che no. Poi partiosi dalla Regina senz'altro dire consultò il Fernandez, il cui ingegno conosceva, e disegnatane insieme, e poi



Previous to his appointment in Portugal at the court of King João V in 1719 as the teacher of the young Maria Barbara and her uncle, the king's brother Dom Antonio, Scarlatti had visited the Medici court (in the company of his father Alessandro) at least twice, in 1702 and in 1705. Cristofori's *cembalo a martelletti* probably impressed the younger Scarlatti and may have prompted him to recommend the new instruments when he went to take up his post in Portugal. There were certainly *cembali a martelletti* by Cristofori at King João's court; this we know from Niccolò Susier, a theorbo player at the Medici court in Florence. In 1732, on the occasion of Cristofori's death, Susier cited Cristofori as having 'served His Majesty the King of Portugal who paid two hundred *louis d'or* for the said instruments ...'. The 'said instruments' were Cristofori's *cembali a martelletti*, described by Susier as '*Cimbalo del Piano, e Forte*, known throughout Europe.'<sup>8</sup>

Frederick the Great reigned as King of Prussia from 1740 until his death in 1786.<sup>9</sup> By the late 1740s he possessed fine examples of both the quilled harpsichord and the *piano forte*, as Charles Burney called the *cembalo a martelletti*.<sup>10</sup> Burkat Shudi, a Swiss harpsichord maker who had settled in London, made for the king a total of five two-manual plucked harpsichords. The first of these, which Shudi sent as a gift in about 1747, may have had a 'lute' stop and a 'machine' stop.<sup>11</sup> A lute stop comprises an alternative set of jacks to pluck one of the two sets of 8-foot strings. This extra set of jacks is situated close to the nut and thus produces a distinctive and nasal sound analogous to the sound of a guitar when the strings are played close to the bridge rather than above the sound hole. The other special device, the so-called machine stop, is a means of radically changing the registration on both keyboards by means of a single pedal. In two-manual instruments the machine stop usually changes the disposition from two 8-foot unisons and an octave on the lower keyboard with one unison on the upper keyboard, to just one of the unisons on the lower keyboard with

esequita l'opera, fecelo improvvisamente trovare alla Regina nelle sue stanze.' Sacchi, *Vita*, *op. cit.*, 47–8.

8 Quoted and translated in: Pollens, *The early pianoforte*, Cambridge 1995, 55. João V, born 1689, reigned from 1706 to 1750.

9 For much of the information on the harpsichords of Frederick the Great I am indebted to: David Wainwright and Kenneth Mobbs, 'Shudi's Harpsichords for Frederick the Great', *The Galpin Society Journal* XLIX, 1996, 77–94. But see too: A. J. Hipkins (with revisions by E. J. Hopkins), 'Shudi, Burkat', in: H. C. Colles (ed.), *Grove's dictionary of music and musicians*, 3<sup>rd</sup> ed., 5 volumes, New York 1947, vol. IV, 746–8.

10 'Signor Farinelli has long left off singing, but amuses himself still on the harpsichord and viol d'amour: he has a great number of harpsichords, made in different countries, which he has named according to the place they hold in his favour, after the greatest of the Italian painters. His first favourite is a *piano forte*, made at Florence in the year 1730 [...]' Charles Burney, *The present state of music in France and Italy: or, the journal of a tour through those countries, undertaken to collect materials for a general history of music*, 2<sup>nd</sup> ed., London 1773, 211.

11 The instrument made by Shudi for Queen Charlotte of England in 1740 also had a lute stop and a machine stop. See: Hipkins, 'Shudi', *op. cit.*, 746–8.



the contrasting lute stop on the upper keyboard.<sup>12</sup> The machine stop not only serves to change the timbres available on the two keyboards, however. Used judiciously it can serve as a *decrescendo* and *crescendo* device for the lower keyboard. By carefully pressing down or releasing the pedal the octave and second unison are gradually withdrawn (*decrescendo*) or brought on (*crescendo*).<sup>13</sup>

The other four harpsichords owned by the king were ordered from Shudi in 1763 and were duly made in 1765 and 1766. The oldest of them had both the lute stop and the machine stop. The two made in 1766 not only had these two special devices but also the so-called Venetian swell. This consists of a series of wooden laths individually hinged in a frame to cover the whole of the soundboard. When the pedal on the right is pressed down, the laths open, producing a *crescendo* or sudden *forte*.<sup>14</sup> Because the machine stop and the Venetian swell were operated by pedals, they could be used while playing.

According to A. J. Hipkins, King Frederick also possessed at least three *Hammerflügel* by Gottfried Silbermann, all said to have been made in 1746.<sup>15</sup> In 1881 Hipkins saw these pianos, one at each of the royal residences, that is, Sans Souci, the Neues Palais and the Stadtschloß. The two *Hammerflügel* belonging to Sans Souci and the Neues Palais are still in Berlin.<sup>16</sup> They both have a means of making a sound said to imitate the quilled harpsichord: hand levers can be used to lower little plates of ivory onto the strings, either in the bass or in the treble or in both, giving a bright and silvery sound. The action of these two *Hammerflügel* closely resembles the action found in Cristofori's surviving *cembalo a martelletti*. The latter are dated 1720, 1722 and 1726.<sup>17</sup>

12 In fact the machine stop takes away all the stops previously engaged on the lower keyboard except the 8-foot stop which can only be played from the lower keyboard.

13 See: Edwin Ripin, 'Expressive devices applied to the eighteenth century harpsichord', *The Organ Year Book* I, 1970, 65–80. By pressing the pedal slowly the octave and the upper manual unison are retracted in turn. As each plectrum extends gradually less and less under its string a weaker and weaker pluck is made, giving a *decrescendo*.

14 Edwin Ripin argued that machine stops were also intended to produce *crescendi* and *diminuendi* and that the machine pedal was often more effective in this respect than the Venetian swell pedal. See: Ripin, 'Expressive devices', *op. cit.*, 65–80.

15 See: A. J. Hipkins, 'Silbermann', in: H. C. Colles (ed.), *Grove's, op. cit.*, 755.

16 The pianos by Gottfried Silbermann in Berlin are *circa* 1746, Stiftung Preußische Schlösser und Gärten, Potsdam, Neues Palais, Berlin (inv. no. V 12) and 1746, Stiftung Preußische Schlösser und Gärten, Potsdam, Sanssouci, Berlin (inv. no. V 13). The third, in some sources dated 1747, was destroyed in a fire in 1945. There is also a *Hammerflügel* by Johann Heinrich Silbermann (1727–1799) in Berlin which is dated 1776 (Musikinstrumenten-Museum, inv. no. 12).

17 The three Cristofori pianos are of 1720 (Metropolitan Museum of Art, New York), 1722 (Museo degli antichi strumenti musicali, Rome) and 1726 (Musikinstrumenten-Museums der Universität Leipzig). See: Pollens, *The early pianoforte, op. cit.*, chapter 6, especially 206, for a comparison of the actions of the pianos of Cristofori and Silbermann.



Carl Philipp Emanuel Bach was employed at the Prussian court from 1740 to 1767 and must have known the *Hammerflügel* by Silbermann and the first harpsichord sent by Shudi. Bach was obliged to play the keyboard instruments in the king's concerts. These took place every night of the week except Mondays and Fridays, the opera nights. It is not known which of the keyboard instruments Bach preferred or which ones he played to accompany the king. After twenty-seven years of service, he finally managed to get away from Potsdam and took up the post of *Kapellmeister* in Hamburg. He had probably already left Berlin when the four new harpsichords by Shudi arrived.

## The combination of the harpsichord and the piano

The two instruments we distinguish as the harpsichord and the piano thus existed side by side in three important courts in Europe, courts both prestigious and musical. There is some circumstantial evidence to show that at all three courts there were times when the harpsichord with hammers may even have been the preferred instrument of the two. Grand Prince Ferdinando seems to have especially favoured Cristofori's invention of a harpsichord with hammers from about 1700 onwards.<sup>18</sup> When still a princess in Spain, Maria Barbara probably already had a Florentine piano at each of three of the royal palaces, those in Madrid, El Escorial and Aranjuez.<sup>19</sup> The first of her three 61-note quilled harpsichords probably did not arrive until 1748, that is, after her accession to the throne. The other two did not arrive at El Escorial and Aranjuez until ten weeks before Scarlatti's death in 1757 and a year before the Queen's death in 1758. Similarly, King Frederick already had a *Hammerflügel* by Silbermann at each of three royal palaces in Berlin when Shudi's gift of a quilled harpsichord arrived in 1747. It took another fifteen years before the King ordered another three quilled instruments from Shudi.

Other quilled instruments were certainly in use at each of the three courts alongside the instruments with hammers. Perhaps the different instruments were deployed for different uses, the harpsichords with hammers for more intimate occasions and those with plectra for more public ones. In any case we can say that both harpsichords with plectra and those with hammers were made, used and appreciated throughout most of the eighteenth century. It is thus not surprising to find announcements of keyboard instruments – and surviving instruments – which combine a hammer action with a plucking action.

18 See: Montanari and Ferrari, 'Presenza del pianoforte', *op. cit.*

19 See: Michael Latcham, 'The twelve *clavicordios* owned by Queen Maria Barbara of Spain and the seven *cembali* owned by Carlo Broschi, known as Farinelli. Facts and speculation', to appear in the proceedings, edited by Luisa Morales, of the FIMTE conference held in 2004.



Probably the earliest mention of the combination of the two actions is to be found in the presentation by Jean Marius to the French Royal Academy of Sciences in 1716 of plans for various versions of his *clavecin à maillets*. One of these combined a plucking action with a hammer action.<sup>20</sup> Although Marius's plans were probably never fully realised, a model of one of his instruments was demonstrated in front of the Academy in 1717.

Another maker who designed combination instruments was Wahl Friedrich Fickert of Zeist. He was cited in the *Leipziger Post-Zeitungen* as the inventor of a 'Cymbal-Clavir' already in 1731. According to the description, the *Cymbal-Clavir*, meaning a hammered dulcimer with a keyboard (for us an early piano), had the shape of a large harpsichord. It had four sets of strings, was strung with wire, and had a down-striking action.<sup>21</sup> There was a stop which imitated the sound made by the hammered dulcimer played with its hammers bound with cloth – presumably a moderator with which woven woollen tabs were inserted between the hammers and the strings – and another for damping the strings when required, perhaps a single damper which silenced all the strings at once. The 1731 report concludes with the remark that the whole had the quality of the very famous instrument called the *Pandalon*, a reference to the giant hammered dulcimer of Pantaleon Hebenstreit.<sup>22</sup> The instrument by Fickert cannot

20 See: Albert Cohen, *Music in the French Royal Academy of Sciences, A study in the evolution of musical thought*, Princeton 1981, 47. For a discussion of Marius's invention of a hammer action see: Albert Cohen, 'Jean Marius' *Clavecin brisé* and *Clavecin à maillets* revisited: the "Dossier Marius" at the Paris Academy of Sciences', *Journal of the American Musical Instrument Society* XIII, 1987, 23–38. For more on Marius see: Pollens, *The early pianoforte*, *op. cit.*, 215–23. Marius's invention of a hammer action was not approved as novel by the Academy at the time. Like Merlin, Marius had a great zest for invention. He designed a portable folding harpsichord, a portable organ and a bowed keyboard instrument. His other inventions included a folding umbrella, a collapsible tent and more. See: Cohen, 'Jean Marius' *Clavecin brisé*, *op. cit.*, 23.

21 The mention of wire was presumably to make sure the reader understood that the instrument was not strung in gut.

22 'Denen Liebhabern der edlen Musique dienet zur Nachricht, das von dem Orgel- und Instrument-Macher, Nahmens Wahl Friedrich Fickern in Zeitz, abermahl ein neu musicalisches Instrument inventariet und verfertigt worden, welches Cymbal-Clavir genennet wird; es ist in Form ein 16-füßigen Clavicymbels, und 4 Chörig, met Drat-Saiten bezogen; an Gravität und Force übertrifft es den stärcksten Clavicymbel, und stehet in der Stimmung so lange, als ein gut Clavichordium ohne die geringste Accomodirung, lässet sich also leichte tractiren, da doch die Hämmergen auf 2½ Zoll von oben herabwärts an die Saiten schlagen. Überdiß hat es auch einige Veränderung: 1) eine angenehme Dämpffung, als ob mit betuchten Hämmergen gespielt würde; 2) kan man auch, vermittelst eines Zuges, das Untereinandersausen in wärenden Spielen verhindern, gleichwie das Tuch in der Tangente eines Clavicymbels die Saite stille machet. Dieses Instrument, welches um einen civilen Preiß zu haben, hat die Eigenschafft des von dem hochberühmten Pandalon erfunden Cymbals, und ist von vielen Virtuosen admiriret und approbiret worden.' *Leipziger Post-Zeitungen*, 23 October 1731, 668, quoted in: Christian Ahrens, 'Zur Geschichte von Clavichord, Cembalo und Hammerklavier', in: *Cembalo und Hammerflügel. 10. Tage alter Musik in Herne*, catalogue, Herne 1985, 59.



be shown conclusively to have been a combination of a harpsichord and a piano but curiously, two of its features, the down-striking action and the four sets of strings, both appear again in the combination instruments of Merlin some fifty years later.

Another instrument by Fickert (or Ficker, as he was also known), similar to the one described in 1731 but this time almost certainly a combination instrument, was mentioned in 1742 in the *Leipziger Post-Zeitungen*:

It is a new *Clavicin* made with three keyboards, of which the two lowest keyboards govern four choirs of strings, and with various combinations of stops. But the third keyboard is like a *Cymbal*, using hammers and again various combinations of stops.<sup>23</sup>

This instrument appears to have been a double-manual quilled harpsichord combined with a harpsichord with hammers.

In 1765 an announcement was made in another Leipzig newspaper describing a combination instrument by Franz Jakob Spath of Regensburg. A *Forte-piano-Clavecin*, probably his *Tangentenflügel*, was combined with a quilled *Flügel*, meaning a quilled harpsichord:

The above-mentioned Hr. Spath is generally known for his *Clavecins*. It is undeniable that these have many advantages, in particular their silvery, majestic sound and their accuracy. Now, for even greater enjoyment, he has combined the above-mentioned *Forte-piano-Clavecin* with the quilled *Flügel* in the most beautiful arrangement, including two keyboards, to give much delightful variety.<sup>24</sup>

Stein spent at least a few months of 1749 (and possibly longer) as a journeyman in Spath's workshop in Regensburg before settling down in Augsburg.<sup>25</sup> During that time Spath may have inspired Stein to make instruments with hammers and

23 'Es ist ein neues Clavecin mit 3. Clavieren verfertigt worden, woran die 2. untersten Claviere 4 chor regieren von unterschiedlichen Veränderungen, das dritte Clavier aber ein Cymbal mit regierenden Hämmergen und unterschiedlichen Veränderungen vorstellt.' *Leipziger Postzeitung*, 22 December 1742. Quoted in Ahrens, 'Zur Geschichte', *op. cit.*, 44–72.

24 'Gedachter Hr. Spath, welcher bekanntermaßen seinen Clavecins, puncto des silberhaften majestätischen Klanges und der Accuratesse, ohnstreitig sehr vieles zum Voraus besitzt, hat noch zu grösserm Vergnügen gedachtes Forte-piano-Clavecin mit dem bekielten Flügel vermittelst zweyer Manualien zu vergnügter Abwechslung in schönster Einrichtung verbunden.' *Leipziger Zeitungen*, 10 September 1765, 564.

25 In his unpublished notebook, page 52, Stein wrote: '1749/le 16 jour du mois 8br./ je m'on suis arive à Regenspurg et on suiter/ jour comance travailler/ chez Mr. Franz Spath'. The accounts which then begin go on into 1750. But in the notebook on pages 238–9 Stein gives a list of the instruments he made headed by the words 'Als ich im Jahr 1749 nacher/Augsburg kam so verfertigte/ich folgende Instrumente' (in ink), indicating that he came to Augsburg in 1749. The date 1749 is crossed out in pencil and 1750 written instead. If this pencilled date is Stein's he may have worked longer than three months with Spath. I would like to thank the Streicher family for kind permission to examine Stein's notebook and Michael Ladenburger for making this possible.



perhaps even combination instruments as well. Spath, half a generation older than Stein (Spath was born in 1714, Stein in 1728) appears to have constructed even more complex combination instruments than those we know by Stein; the advertisement for Spath's instruments of 1765 continues:

... To different courts this artist has also delivered complex and large works of art, *Clavecins* with two or three manuals placed one above the other. These also have a *Flauto-Traverso* and *Violoncello* besides many other excellent *Veränderungen* for playing accompaniments, instantaneously playing *forte*, *piano* and *pianissimo* in an incomparable way. By his own able performances he [Spath] has made himself famous in almost every place. *Liebhaber* can find these excellent and artful instruments by the above mentioned Hrn. Spath in Regensburg.<sup>26</sup>

Four years later, in 1769, Stein's *Poli-Toni-Clavichord* was announced in the *Augsburger Intelligenzblatt* of 5 October.<sup>27</sup> The *Poli-Toni-Clavichord* combined a plucked harpsichord (with a 16-foot stop and three 8-foot unison stops) with a *Pianoforte*.<sup>28</sup> Just over half a year later, in J. A. Hiller's *Musikalische Nachrichten und Anmerkungen die Musik Betreffend* of 30<sup>th</sup> April 1770, Spath announced his combination of his *Clavecin d'Amour*, an instrument with his *Tangirung*, with the *Flügel*.<sup>29</sup> By *Tangirung* he must surely have meant his tangent action, in those days considered to be a type of hammer action, and by *Flügel* he meant the plucked harpsichord.<sup>30</sup> While Spath's *Clavecin d'Amour* had two keyboards giving 'fifty different changes of timbre', Stein's *Poli-Toni-Clavichord* had three keyboards and, as its name suggests, could produce 'many different sounds'. Spath's announcement of 1770 declared his instrument to be a 'new invention' even though he had already announced a very similar instrument in 1765. Perhaps Spath needed to repeat his claim for a new instrument because of Stein's similarly 'new' invention of 1769.

26 'Auch ist dieser Künstler auf eine ganz neue vortreffliche Probe verfallen, das Ziehen und Wachsen der Töne ganz zärtlich und rührend auf dem Clavichord anzubringen; und da überhaupt dieser Meister an verschiedene Höfe bereits weitläufige und große Kunststücke von Clavecins mit 2 und 3 übereinander liegende Manualien, wobey nebst andern vielen vortrefflichen Veränderungen auch eine Flauto-Traverso und Violoncello, zum Accompagnement ganz unvergleichlich forte piano und pianissimo im Moment zu spielen, angebracht ist, geliefert, und sich durch selbst eigene geschickte Vorspielung fast aller Orten sehr berühmt gemacht, so können Liebhaber diese vortrefflichen und künstlichen Instrumente bey erstgedachten Hrn. Spath in Regensburg selbst finden.' *Leipziger Zeitungen*, 10 September 1765, 564.

27 Anonymous, 'Von Erfindung eines Poly-Toni-Clavichordii oder musikalischen Affecten-Instruments, und von Verbesserung eines neuen Orgelwerks', *Augsburger Intelligenzblatt* XL, 5 October 1769, no pagination.

28 The words *Poli-Toni-Clavichord* and *Pianoforte* appear to be Stein's. The first can be interpreted to mean 'the stringed keyboard instrument' (*Clavichord*) 'with many tones' (*Poli-Toni*).

29 See: Franz Jakob Spath, [Advertisement], *Musikalische Nachrichten und Anmerkungen die Musik Betreffend* IV/18, 30 April 1770, 142.

30 See: Michael Latcham, 'Franz Jakob Spath and the *Tangentenflügel*, an eighteenth-century tradition', *The Galpin Society Journal* LVII, 2004, 150–70.



## Surviving combination instruments

The earliest surviving instrument which combines a plucking action with a hammer action was built in 1746 by Giovanni Ferrini.<sup>31</sup> This instrument, in the Tagliavini collection, Bologna, has two keyboards, the upper one for the hammer action, the lower one for the two sets of harpsichord jacks. The hammers and the jacks share the same two sets of 8-foot strings but cannot be combined on either of the keyboards.

The next dated instrument to have survived which originally combined both actions was made in Bern and is signed *par Hellen 1763*; it is in the Giulini collection, Brioso.<sup>32</sup> The two actions, both played from one keyboard, had separate strings which shared one soundboard; the piano action had three 8-foot strings for each note, the harpsichord action one. Each of three other similar instruments, unsigned but probably all *par Hellen*, once combined a hammer action with a harpsichord action.<sup>33</sup>

Two harpsichord-pianos by Johann Andreas Stein survive.<sup>34</sup> These can be played by two persons, one at each end, and are therefore called *vis-à-vis* instruments. The one of 1777, now in Verona, has three keyboards at the harpsichord end and one at the piano end. The harpsichord has a 16-foot stop and three 8-foot stops, like the *Poli-Toni-Clavichord* described in 1769. All four of the harpsichord stops can be combined with the piano action together on the lowest of the three keyboards at the harpsichord end.<sup>35</sup> There is a buff stop for one of the sets of plucked strings as well as a moderator and a means of lifting the piano dampers for the hammered strings. Both the moderator and the sustaining device can be engaged from either end of the instrument. The 1783 instrument, now in Naples, has only two keyboards at the harpsichord end and only three harpsichord stops, an 8-foot stop plucked by soft leather plectra and an 8-foot stop and an octave both plucked by quill plectra. The three knee levers at the piano end serve the following functions: one is for combining the piano action

31 For a description, see: Luigi-Ferdinando Tagliavini, 'Giovanni Ferrini e il suo cembalo "a penne e a martelletti"', in: Thomas Steiner (ed.), *Instruments à claviers – expressivité et flexibilité, Actes des rencontres internationales harmoniques, Lausanne 2002*, Bern, Berlin, etc., 2004, 13–32.

32 For this and other instruments *par Hellen*, see: Michael Latham, 'The musical instruments *en forme de clavecin* by, or attributed to, Johann Ludwig Hellen', *Musique – Images – Instruments* VI, 2004, 68–94.

33 One, undated, is in the Germanisches Nationalmuseum, Nuremberg, inv. no. MINe 105; the second (of before 1779) is in the Musikinstrumenten-Museum, Berlin, inv. no. 2165 and the third is in private ownership in France.

34 See: Michael Latham, 'Mozart and the pianos of Johann Andreas Stein', *The Galpin Society Journal* LI, 1998, 114–53.

35 There are trackers connecting the two keyboards in a false bottom underneath the instrument.



with that of the harpsichord action; one is for disengaging the piano dampers and the third is for gradually taking off the two stops using quill plectra leaving just the one using soft leather plectra. In comparing the two *vis-à-vis* instruments we can say that the one of 1777, with a 16-foot stop and with hand-operated levers for the harpsichord stops, makes a German impression while the one of 1783, with its soft leather plectra for one 8-foot stop, the disposition of the harpsichord (two 8-foot unison and an octave) and its *genouillères* (one for making a *decrescendo*), shows the influence of the French harpsichord and piano maker Pascal Taskin.

A fascinating instrument, made in Murcia by the Spaniard Tadeus Tornel in 1777, originally combined a harpsichord action, a simple piano action and a rank of organ pipes (fig. 1).<sup>36</sup> The single keyboard is beautifully made with covers for the naturals of a dark streaky tropical wood, possibly *lignum vitae*, and solid bone sharps. The case, in solid walnut, has a double-curved bentside in the style of the harpsichords made by Hieronymous Hass of Hamburg. The stand, also reminiscent of the North German school, has seven turned baluster legs; these are joined by a stretcher at the bottom and a moulded frame at the top. There are three strings for each note throughout the five-octave compass, GG to g3, and there was once a set of organ pipes, from d1 to g3, installed under the keyboard.<sup>37</sup> The pipes have been gone since at least 1881 although the intermediate levers which once activated the organ pallets are still present under the keyboard. These couple with the keyboard above when the appropriate pedal is pressed.<sup>38</sup> The space under these levers is large enough for a set of stopped wooden pipes, perhaps breaking back to open metal pipes for the top notes, at 8-foot pitch.<sup>39</sup> The double bellows under the instrument still produce a

36 Museo Arqueológico, Murcia, inv. no. 2257. The piano action is a *Stoßmechanik* without an escapement mechanism. I am grateful to Luisa Morales for bringing this instrument to my attention and for arranging for me to see it. I am also grateful to Mariángeles Gómez Ródenas, curator at the Museo Arqueológico, for arranging for me to document the instrument and do some conservation work on it. My thanks also to María Sanz Nájera of the Spanish Ministerio de Cultura for granting permission for this project and for providing funds to enable the project to be realised.

37 The gauges for the strings are marked on top of the damper jacks in ink and start at gauge 000 (0.66 mm) for GG and end with gauge 6 (0.27 mm) from c3 to the top. The longest GG string has a sounding length of 1876 mm and that of c2 303 mm. The slender bridge, with the strings back-pinned all the way, is S-shaped. For a discussion of string gauges see: Michael Latcham, *The stringing, scaling and pitch of Hammerflügel built in the southern German and Viennese traditions*, 2 vols., München und Salzburg 2000, I, 32–5.

38 In the museum there are documents which show that a plan was made (but never carried out) to restore the missing organ pipes in 1881.

39 The c1 pipe of such a stopped diapason at 8' pitch in the 1781 *Claviorganum* by Stein in the Gothenburg Historical Museum (inv. no. 4478) has a speaking length of 295 mm. The top octave has open metal pipes. The depth of the space under the keyboard for the pipes (which began at d1) in the Tornel instrument is 480 mm, giving plenty of space for an 8' stop of the type in Stein's instrument.





Figure 1: *The 1777 harpsichord-organ-piano by Taddeus Tornel in the Archaeological Museum in Murcia. Three of the four pedals can be seen as well as the two knee levers for the organ bellows. The organ pipes were housed under the keyboard.*

stream of air through a hole in the baseboard (under the keyboard in the bass) and are pumped by two knee levers.

The extra effects on Tornel's instrument include a harp stop, which operates from under the strings next to the nut, and a means of disengaging the dampers. The latter have their own set of jacks riding in a box slide. The slide, situated against the wrestplank in the gap, moves vertically by a few millimetres to lift all the jacks together, thereby also lifting all the pairs of cloth damper flags off the strings. The jacks originally served a double function; they not only acted as damper jacks for the hammer action but also had plectra in pivoting tongues (as in normal harpsichord jacks) which plucked the left-hand string of each choir of three. Although the tongues of the jacks have all been removed, some of their bristle springs for returning them after they plucked and many of their brass axles are still present. The harpsichord stop was engaged when the jack slide shifted to the right in the normal fashion. Whether this 8-foot harpsichord



stop was on or off the two damper flags mounted in each jack reached across all three strings of the respective choir.

This harpsichord-piano-organ never had any means to engage the stops by hand. Instead, there are four pedals for the purpose discreetly projecting from under the broad part of the stretcher, in fact a shallow box, which joins the two front legs. There appears never to have been a means of hitching the pedals in their pressed-down positions. From left to right the pedals performed the following functions: the first raised the harp stop batten and its three loosely-secured layers of different-coloured woven wool so that the latter touched the strings; the second pedal disengaged the treble hammers and simultaneously engaged the organ pipes; the third pedal lifted all the damper jacks off the strings but appears to have left the plectra below the level of the strings so that the instrument could be played with the quill action but without dampers; the fourth pedal put the hammers out of action and simultaneously engaged the plectra. The plucking action and the hammer action could not be combined. The linking levers operated by the pedals are still contained inside the stretcher. These levers lift four vertical wooden rods hidden in a large flat box which vertically joins the stretcher of the stand to the top of the stand on the spine side. These wooden rods, visible only when the instrument is lifted from the stand, enter another flat box attached to the spine of the harpsichord. Both in shape and contents, this last box is similar to the box and mechanisms of an English machine stop.

It is likely that similar mechanisms must have linked the foot pommels to the stop action of another, earlier Spanish instrument, the one by Fernández designed by Farinelli for Queen Maria Barbara. Nevertheless, in the latter instrument, the rods, some fourteen metal ones rather than four wooden ones, were concealed inside the two front legs.<sup>40</sup> While some of the ten pommels of Maria Barbara's instrument operated a complete stop others engaged only half of a divided stop. Others again operated two or more stops at a time. The first pommel, for instance, engaged the complete 4-foot stop while the third engaged the gut strings and the harp stop in the bass.

The possibilities available on the instrument by Tornel can be summed up as follows. Without pressing any pedals the hammers were engaged. In this mode the player could use his feet to disengage the dampers or to engage the harp stop, both intermittently. By pressing the pedal which engaged the harpsichord jacks the hammers were put out of action. The player then had one foot free for three options: first, the flute could be added to the harpsichord in the treble; second, the harp stop could make the harpsichord sound *pizzicato*; third, the

40 French eighteenth-century harps often contain seven metal rods in their slender hollow columns. The detailed description of Maria Barbara's instrument is to be found in the inventory of Farinelli's instruments cited in: Cappelletto, *La voce*, *op. cit.*, 209. I discuss the description in: Latcham, 'The twelve *clavicordios*', *op. cit.* (to appear).



dampers could be disengaged. Only one of these three options was possible at once; the pedals are so far apart that with one foot only one of them can be pressed down at a time. By pressing the pedal which engaged the flute in the treble the treble hammers were automatically disengaged, thus leaving only the bass hammers engaged. This again left one foot free for three possibilities: first, to swap the bass hammers for all the harpsichord jacks; second, to engage the harp stop; third, to disengage the dampers.

These various combinations or *Veränderungen* (as they were called in Germany) might have been advertised in the eighteenth century as 'more than ten different *Veränderungen*' or as 'many different changes of stops' or even as 'not dissimilar to a complete group of many instruments'. If the description had been more specific it might have given the names of instruments to the different sounds available: the flute, the harp, the *Pianoforte*, the harpsichord and probably the *Pantolon*.

The latest combined harpsichord-piano of the eighteenth century to have survived is to be found in the Smithsonian Institution, Washington D.C.<sup>41</sup> The nameboard, which dates from the 1920s, declares the instrument to have been made by Robert Stodart in 1777. There seems no doubt however that the maker of the instrument was James Davis; the instrument matches Davis's 1792 patent specification in practically every respect down to such details as the design of certain metal parts of the pedal mechanisms. The instrument and the drawing are in any case the same in all qualitative respects relevant to the mode of operation.<sup>42</sup> To quote from the patent application (and to describe the drawing which accompanies the application) thus serves to describe the existing instrument:

... The Piano Forte has one Row of Keys for its own Action and the Harpsichord has also one Row of Keys for its own Action ./- the Upper Row of Keys is for the Piano Forte and the under Row of Keys is for the Harpsichord so that when a person plays either of these Rows he plays either a complete Piano Forte or a complete Harpsichord./.<sup>43</sup>

41 At present in storage at the Smithsonian Institution in Washington D.C., cat. no. 315,718. I am grateful to Cynthia Hoover for her permission to examine this instrument and for her help, and to Steve Velasquez for his kind and patient assistance.

42 There are discrepancies between the measurements of the case of the instrument and the corresponding measurements in the drawing, using the scale given on the drawing. But the vellum of the drawing is more than two hundred years old and obviously distorted.

43 See: *Patents for inventions. Abridgments of specifications relating to music and musical instruments A.D. 1694-1866*, London 1871 (facsimile: London 1984), 27. The original manuscript application, transcribed here, is to be found in The National Archives, Kew, London, signature: c54/ 7069. The peculiar punctuation follows the original. The 1871 publication of the applications provided them with punctuation (which most of the eighteenth-century patent applications did not have) and in some cases with spelling changes. I am grateful to Rosemary Hall for preparing the ground and helping me with my research in The National Archives.



In the drawing which accompanies the original patent application the two actions are shown sharing the same strings. Both the bridge and the nut are divided and the instrument is triple-strung throughout.<sup>44</sup> The escapement action is typical of that used in English grand pianos of the time. In this instrument the leathered hammers would normally strike all three strings of each choir while each pair of harpsichord jacks, if engaged, would pluck the two outer strings of the three. As in the harpsichord-piano by Ferrini, although each action has its own keyboard, the two actions cannot be coupled on one keyboard. The two keyboards are aligned and each key is positioned directly under its respective strings, allowing the hammer action to function correctly. The keys of the lower (harpsichord) keyboard are not cranked at the back (as are the harpsichord keys in Ferrini's instrument) to accommodate vertical jacks, so each jack has to lean slightly away from the string it plucks in order to rise up between two choirs of three strings and pluck the outermost string of one choir.<sup>45</sup> The drawing shows two pedals for the piano, one for raising the dampers (again mounted in their own jacks and stretching over all three strings) and one for an *una corda*. Each of the two sets of harpsichord jacks can be disengaged using a hand-operated lever. In this last respect the drawing differs from the surviving instrument. In the drawing the levers protrude through the nameboard, in the instrument they do not.<sup>46</sup>

## Expressive keyboard instruments

We thus have evidence for keyboard instruments combining a plucking action and a hammer action from 1716 (Marius) to 1792 (Davis).<sup>47</sup> In some of the instruments which have survived and in some of those described in contemporary literature the two actions share the same strings. In others the two actions have separate strings and in others again there are separate soundboards as well. All these instruments appear to have been designed to produce a variety of different sounds. The same is true of other, less complex keyboard instruments

44 The gauges for the strings are stamped on the nut and start at gauge 14 (0.825 mm) for FF and end with gauge 9 (0.575 mm) from f1 to the top. The longest FF string has a sounding length of 1815 mm and that of c2 283 mm. All the strings are back-pinned on the bridge. One might say that the scalings, like those in the Tornel instrument, are typical of a piano rather than of a harpsichord.

45 In the 1792 instrument, the jacks are long (271 mm), however, so that the angle is small. Originally both sets were quilled. They now have leather plectra.

46 The levers themselves may not be original however and the nameboard is certainly a replacement.

47 For a more extensive treatment of this theme, see: Latcham, 'The combination of the harpsichord and the piano', *op. cit.*, 68–94.



which, although they do not combine the two actions at least provided the player with numerous stops.

The surviving historical instruments (and those we know from historical descriptions) of both types – those with the two actions and those with one action but with a variety of stops – fall into different sorts. In some the various timbres could be combined simultaneously on one keyboard, as in Stein's magnificent *vis-à-vis* instruments, while in others the different timbres could be selected in succession using knee levers, as in the harpsichords by Taskin with the *peau de buffle* stop and with *genouillères*. Sometimes the various sounds could only be selected using hand levers, as on many German square pianos and on the so-called *liegende Harfe* instruments, or by using both hand levers and knee levers, as on the *Tangentenflügel* of Spath and Schmahl. Other instruments, for instance the *cembalo di registro* by Fernández, the combination instrument by Tornel and the anonymous *Cembalo Angelico* announced in Rome in 1775, have or had pedals for changing the sound.<sup>48</sup> In the English harpsichords with a machine stop the stops could be changed using a single pedal or individually selected using hand-operated levers. In many instances the different timbres could be contrasted using different keyboards, for instance in the instruments with two or three keyboards described above, those variously by Ferrini, Stein, Davis and Shudi, and in the two-manual harpsichords by Taskin. Sometimes different timbres could be contrasted on a single keyboard by using divided stops, as in the *cembalo a martelletti* announced by Paolo Morellati in 1775, or by using stops which only operated for one half of the compass, as is in the instrument by Tornel in which, for instance, the right hand could play a flute solo while the left hand could accompany using the piano action.<sup>49</sup>

In many of these instruments dynamic variation of the sound was possible, not only through the use of a varied touch but also through special devices, some of which enabled the player to change the dynamic level while playing. The availability of an assortment of timbres and the means to vary the sound dynamically can both be understood as means to expression. The sources and instruments given above are only a selection. If we take into account all the surviving instruments and all the sources describing keyboard instruments in which such expressive resources were or are available we are struck by the persistence of an interest in such instruments throughout the eighteenth century.

48 For the *Cembalo Angelico* see: Michael Latcham, 'Four eighteenth-century *cembali*', to appear in the proceedings (Luisa Morales, ed.) of the FIMTE conference held in 2003.

49 For Morellati, see: Michael Latcham, 'The *cembalo a martelli* of Paolo Morellati in its eighteenth-century context', *Recercare* XV, 2003, 149–67. Morellati's instrument could produce many different sounds including those of 'un cembalo a penna de' più sonori' (a quilled harpsichord of more sonority) and a 'spinettina' (an octave spinet).



Not all of the historical instruments or those which are described in the historical sources are as spectacular as those described above. But in some cases we are prevented from fully appreciating particular instruments by our modern view point. The *Clavecin roïal* of Johann Gottlob Wagner, for instance, we see merely as a rather large square piano, defined as such for us by its hammer action.<sup>50</sup> Wagner considered however that his instrument, defined not by the action but by the sounds it made, was capable of being instantaneously transformed into a harpsichord, a *Pantolon* or a piano. It could also imitated the lute and the harp, in the latter case even creating harp sounds of which the harp was not capable. The sounds of all these instruments were produced using various devices, all familiar from the instruments described above. Not only that, dynamic effects could be achieved using touch and by operating a specially designed cover which could be lifted to produce sudden *forte* effects. The changes from one instrument sound to another could all be made without removing the hands from the keyboard, another advantage already noted in many of the instruments described above.

Other misunderstandings involve the adoption of 'period' instruments for playing eighteenth-century music without fully accepting the possibilities which those instruments offer. It is of course true that our point of view must remain modern and that the context in which we use old instruments is always a modern one. If nevertheless it is our endeavour to embrace as nearly as possible an eighteenth-century understanding of performance practice, we will be going against that endeavour by ignoring aspects of eighteenth-century instruments which do not fit our modern point of view, for instance by neglecting the possibilities offered by the types of instruments described above or indeed by negating the existence of those instruments in the eighteenth century. For instance, some of the possibilities offered by the harpsichords made or enlarged by Taskin are often ignored.<sup>51</sup> Many of them have two keyboards which can be coupled and there are two 8-foot stops and an octave stop. This disposition is familiar in today's terms as the 'French' disposition. But such harpsichords often have an extra set of jacks with the soft *peau de buffle* leather plectra and a set of knee pommels, the so-called *genouillères*. These, the means for making dynamic variation and for making changes of timbre, are examples of the resources used for expressive playing which were of interest in the eighteenth century. Nevertheless they are often omitted in copies of the originals and rarely used when they are available. Other similar examples could be mentioned. We tend to reject, for instance, the idea that the sound of hammers striking the strings

50 For a detailed treatment of the *Clavecin roïal*, see: Michael Latham, 'The *Clavecin roïal* of Johann Gottlob Wagner in the context of the eighteenth century', to appear in: Monika Lustig, (ed.), *Zur Geschichte und Bedeutung des Tafelklaviers (Michaelsteiner Konferenzberichte, Band 68)*.

51 For the *peau de buffle* and the *genouillères* see: Latham, 'The combination', *op. cit.*, 115–7.



could ever have been simultaneously combined with the sound produced by plectra plucking the same strings.<sup>52</sup> Our rejection of this combination is probably based on our assumption that the opposition between the harpsichord and the piano was as definite in the eighteenth century as we have made it today.

The instruments described above all illustrate an interest in different timbres and in dynamic variation. We might choose to strip the instruments of some of the possibilities they possess and simply call some pianos and others harpsichords. We might then proceed to oppose these two groups and establish a chronology for them in which one group supplanted the other. This then entails that the most exciting of such instruments are described as hybrids, *curiosa* or transitional. But rather than falling back on this interpretation of history it is at the least a salutary exercise to understand eighteenth-century keyboard instruments all as members of a single group. Some were designed to produce one or other timbre while others offered multiple timbres, some offered less possibilities for making dynamic variation, others offered more, some gave the player the possibility of altering the volume or timbre while playing, others did not. None of these parameters appears to have followed a single chronological development and none of them appears to have been exclusive to either of the instruments we define as the harpsichord and the piano.

In the eighteenth century, the interest in keyboard instruments offering dynamic variation and offering different sound colours is admirably illustrated in the work of Stein.<sup>53</sup> In his search for new means to expression in keyboard instruments, Stein was not even satisfied with the touch-sensitive keyboard of his *Pianoforte*. For him there appears to have been little to choose between the quilled harpsichord and the *Pianoforte* in one important respect: in neither instrument could each sound be modified while it sounded, that is, after the strings had been set in vibration; this was the enviable prerogative of the violin. In 1772, when Stein was already building *Hammerflügel*, he wrote a description of his *Melodica*, a special kind of expressive organ he had designed. In it he wrote:

52 The 1769 description of Stein's *Poli-Toni-Clavichord* singles out the combination of the 16-foot harpsichord stop with the hammer action as a solo registration, taking the accompaniment on one of the other keyboards, that is, using harpsichord stops. See: *Anonymous*, 'Von Erfindung eines Poly-Toni-Clavichordii', *op. cit.*, no pagination.

53 The idea that Stein's own development as an instrument maker should be seen as a search for the truly expressive keyboard instrument is the central conclusion of: Eva Herz, *Johann Andreas Stein (1728–1792). Eine Beitrag zur Geschichte des Klavierbaus*, Wolfenbüttel and Würzburg 1937.



I have always pitied the keyboard player. He must have considerable skill to conquer the difficulties of his instrument and yet must be inferior to a violinist or flautist as far as true effect is concerned.<sup>54</sup>

Stein's *Melodica* was a small organ designed as a solo melody instrument to be placed on top of a larger keyboard instrument, a *Hammerflügel* or a quilled harpsichord. On the *Melodica* one could continue to mould each sound until it was silenced; the harder one pressed the keys, the greater the volume – a *crescendo* on a single note was possible. Stein created this instrument not for the harpsichord player or the piano player but simply for the poor keyboard player.

## The creation of combined keyboard instruments

There appear to be at least three reasons why combination instruments came into being. In the first place, as has become clear, such instruments must have been intended to answer a need for expressive instruments, that is, instruments capable of different timbres and of dynamic variation. These expressive effects were created by using touch, by swapping from keyboard to keyboard and through the use of the various stops and devices. These practices are well described in the announcement of Stein's *Poli-Toni-Clavichord*, written in 1769 and already mentioned above. Part of that description reads:

The combination of this many-toned instrument is so constituted in its construction that the most difficult things can easily be played, and then too with *piano* and *forte*, such that it not dissimilar to a complete group of many instruments; it is the coupled mechanism of this *Poli-Tono-Clavichordii* which enables the player to create a sound now pleading and emotional, now gentle and fluent. The *Forte Piano* at the same time imparts to the *Flügel* a most agreeable *Crescendo* and *Decrescendo* such that one can hardly believe it is not the harpsichord itself which possesses this quality even though it actually originates in the *Forte Piano*. On the other hand the harpsichord gives the *Forte-Piano-Instrument*, if it is played undamped, a soft pleasantness, swirling from one level of the affects to another, even in distant keys, without upsetting the ear.

54 'Ich habe immer den Clavieristen sehr bedauert. Er muß große vorzügliche Geschicklichkeit besitzen, um die Schwierigkeiten seines Instruments zu übersteigen, und doch einem Violinisten oder Flötenspieler, was die wahre Wirkung betrifft, nachstehen.' Johann Andreas Stein, 'Beschreibung eines neuerfundenen Clavierinstrumentes, Melodica genannt, von Johann Andreas Stein, Orgel=Instrumentmacher, und Organisten bey der evangelischen Kirche zu den Barfüßern in Augsburg', *Neue Bibliothek der schönen Wissenschaften und der freyen Künste* XIII/1, Leipzig 1772, 109; translation: Edwin M. Ripin, 'Johann Andreas Stein's Melodica', *The Organ Yearbook* VIII, 1977, 56–60.



One can easily understand from this that by the selective use of the four upper stops, as well as through the choice of three keyboards, through swapping the hands, and through the damped and undamped *Forte-Piano-Instrument*, very many changes of registration can be made on this newly invented *Politono Clavichordio*.<sup>55</sup>

In the second place, such combination instruments put at the command of a single player a variety of sounds, satisfying at a time when the idea of variety in unity, the microcosmic reflection of a varied universe under the seeing eye of a single deity, was still attractive. This idea, stronger perhaps in the seventeenth century than in the eighteenth, is particularly well represented in the illustration and description of the famous *Machina Organica* by Michele Todini given in his *Dichiarazione della Galleria Armonica* published in Rome in 1676.<sup>56</sup> In the *Machina Organica*, which appears to have filled a large room, four harpsichords were combined with an organ. All of these could be played from the keyboard of one of the harpsichords, a *Clavicytherium* or vertical harpsichord. The *Clavicytherium* also contained some sort of *Geigenwerk* or bowed keyboard instrument. There were two stops which allowed gut strings to be bowed, probably using rotating rosined wheels. At a single keyboard the player could thus combine the sounds of both plucked and bowed strings with the sounds of what was apparently quite large organ.

In the third place, a delight in ingenuity and inventiveness is apparent in the construction of many of the surviving instruments and is often mentioned in the eighteenth-century announcements of such inventions. This delight, as we shall see in the case of Merlin, may have had its origins in certain metaphysical ideas.

55 'Die Verbindung dieses viel thönigten Instruments ist nach seiner Bauart so beschaffen, daß die schweresten Sachen leicht, und zwar so piano und so forte darauf gespielt werden können, daß es einer complecten Music mit mehreren Instrumenten nicht unähnlich gleichet: indeme durch den zusammen gesetzten Mechanismus dieses Poli-Tono-Clavichordii [sic], im Spielen, jenes bald diesem sein Schmeichelhaftes und Pathetisches, dieses aber bald jenem sein Sanftes und Geläufiges, gibt, und sodann das Forte Piano Instrument dem Flügel zugleich das *crescendo* und *decrescendo* auf die angenehmste Art mittheilet, so daß man nicht anders glaubt, als daß der Flügel selbst diese Eigenschaft habe, da es doch bloß vom Ersten herkommt. Der Flügel hingegen gibt dem Forte-Piano-Instrument, wenn es ohngedämpft gespielt wird, eine sanfte affectuose Annehmlichkeit, und reißt jenen gleichsam von einer Stufe der Affecten zur andern, in fremden Ton-Arten mit fort, ohne das Ohr zu beleidigen.

Man kan demnach hieraus leicht begreifen, daß sich durch das Ab- und Zuziehen der obern 4 Registern sowohl als durch die Wahl von 3 Clavieren, wie auch durch das Abwechslen der Hände, und durch das gedämpfte und ungedämpfte Forte-Piano-Instruments, sehr viele Veränderungen auf diesem neu erfundenen Politono Clavichordio [sic], anbringen lassen.' Anonymous, 'Von Erfindung eines Poly-Toni-Clavichordii', *op. cit.*, no pagination. The author of the description, perhaps Stein himself, seems to have enjoyed the quasi-Latin declension of the name of the new invention.

56 Michele Todini, *Dichiarazione della galleria armonica*, Rome 1676, reprint: Lucca 1988, 7-15.



## Merlin

The background illustrated and discussed above sets the stage for the arrival in London of John Joseph Merlin, brought over in 1760 by the new Spanish Ambassador Extraordinary to the British court.<sup>57</sup>

Merlin was born in 1735 in the town of Huy, near Maastricht and died in London in 1803. Among his numerous inventions were various musical instruments including new members of the violin family and some special keyboard instruments, a number of which has survived. Two harpsichord-pianos and a harpsichord converted by Merlin into a combined instrument are discussed in detail below. First however, two other keyboard instruments are briefly described. One of these, made by Merlin in 1784, combines a single-rank organ with a double-strung square piano and allows the pipes and the strings to be played separately or together; there is also a sustaining device for all the dampers of the strings and a true *una corda*, unusual in a square piano.<sup>58</sup>

The second instrument, a quadruple-strung grand piano of 1786, offers the player two pedals, one for lifting the dampers and another which enables the whole keyboard mechanism to be moved laterally so that from using the down-striking hammers to play four strings each the player can reduce gradually to just one. One of the catalogues of Merlin's own museum describes such an instrument:

XX. Grand Patent *Four Unison Piano-Fortes*, in which the Hammers strike one, two, three or four Strings, at the Option of the Player, who can thus produce the most minute shades of *Diminuendo* or *crescendo*. Price from 60 to 80 Guineas.<sup>59</sup>

Although the reader will remember the quadruple stringing and the down-striking action from Fickert's work, described above, it seems unlikely that there could have been any connection between Fickert and Merlin.

57 For these and further details of Merlin's life and production see: Anne French *et al.*, *John Joseph Merlin, The Ingenious Mechanick*, London 1985. See too: Clare Williams (ed. and translator), *Sophie in London 1786 being the diary of Sophie v. la Roche*, London 1933, 139–41.

58 In the Colt Collection, Bethersden, inv. no. M514M. The keyboard is moved manually a few millimetres towards the player whereby the hammers each strike one string rather than two. Other square pianos with an *una corda* are rare: only one by Johannes Pohlman, *circa* 1785 (Gemeentemuseum, The Hague, inv. no. 2000–0003) and a number by Adam Beyer are recorded. All of these have a pedal for the *una corda*. For Adam Beyer, see: Michael Cole, 'Adam Beyer, piano maker', *The Galpin Society Journal* XLVIII, 1995, 94–119. Cole points out that Beyer was probably the first to use such an *una corda*.

59 Quoted in: French *et al.*, *John Joseph Merlin, op. cit.*, 91. The existing piano of this type is privately owned in England and is described in: French *et al.*, *John Joseph Merlin, op. cit.*, 102–3. Interestingly, the *crescendo* and *decrescendo* appear to be obtained using the pedal rather than through touch.



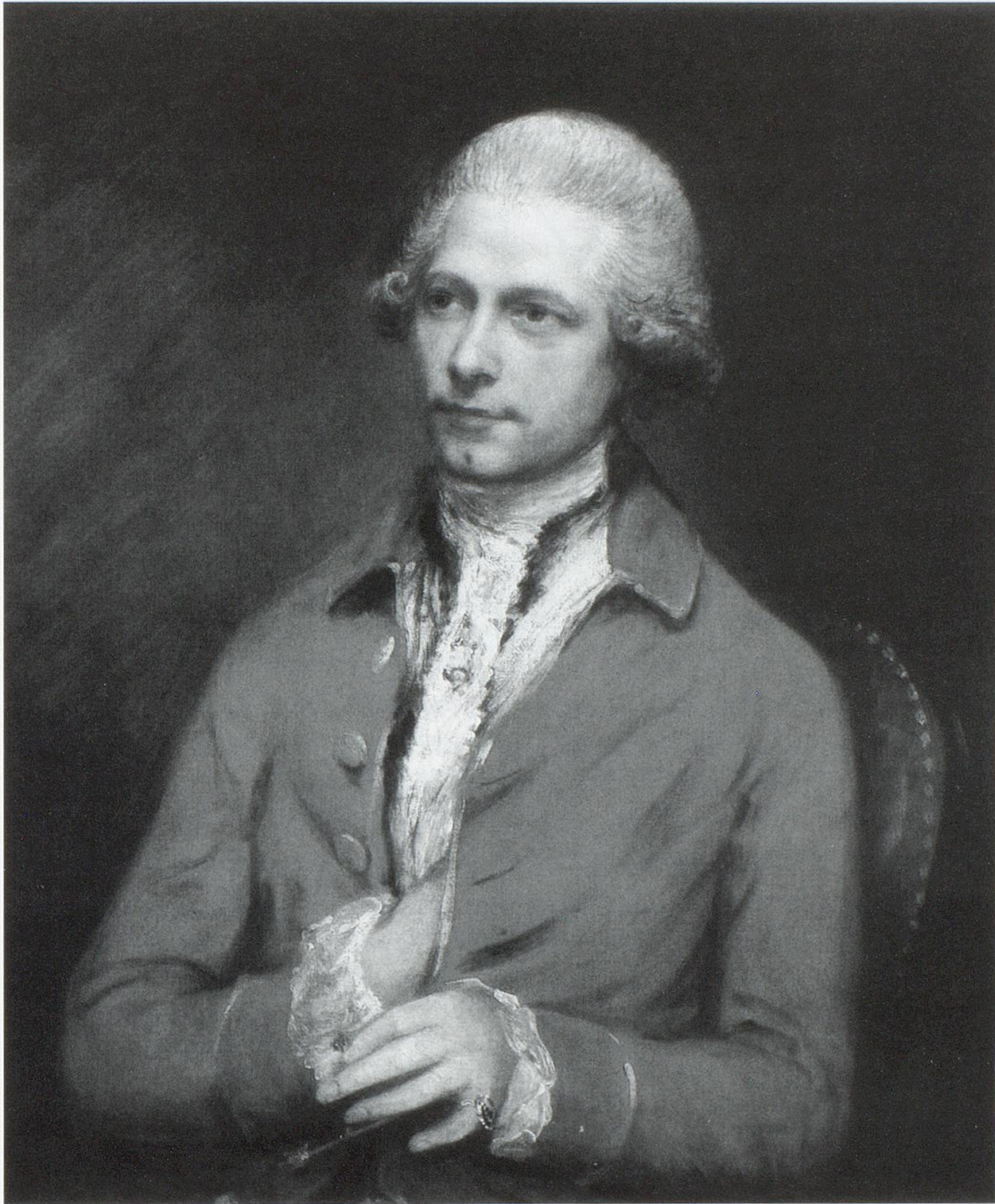


Figure 2: John Joseph Merlin (1735–1803). Portrait by Thomas Gainsborough (1727–1788), 1781 (or earlier). Merlin is shown holding a pocket weighing scale of his own invention.



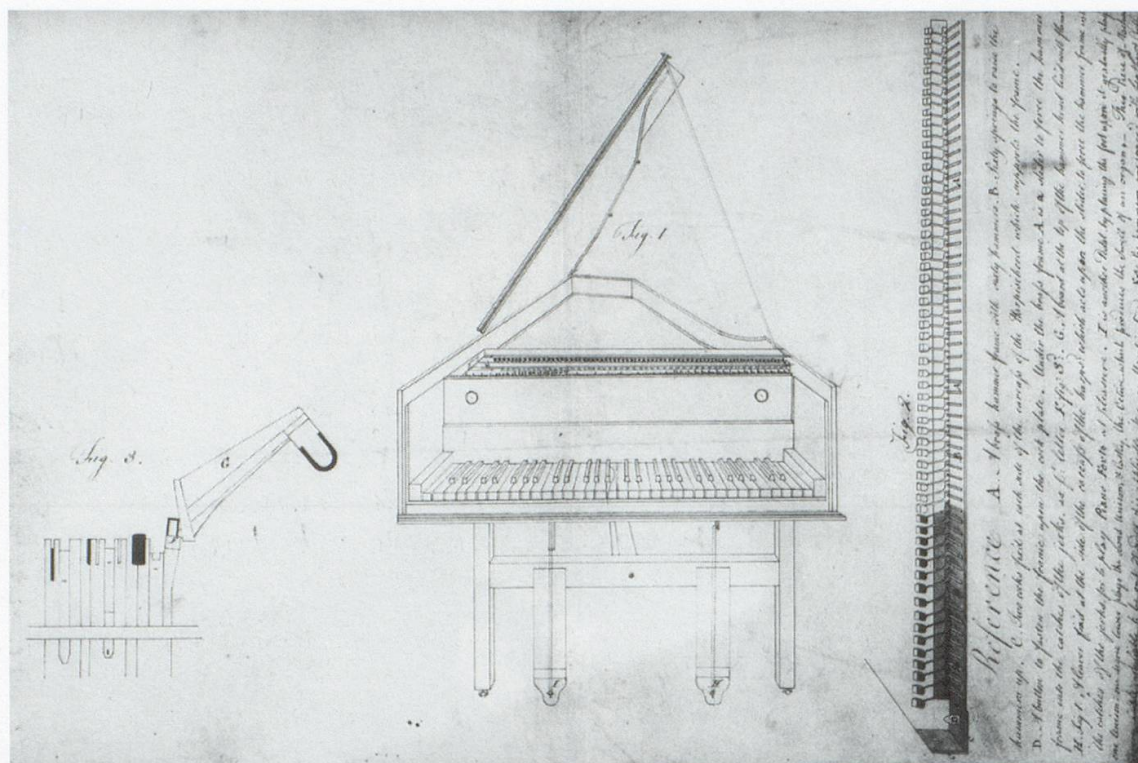


Figure 3: The drawing accompanying Merlin's application of 1774 for adding a down-striking hammer action to an existing harpsichord and for a complete harpsichord-piano. Photo courtesy of the National Archives, Kew, London.

In 1774 Merlin patented both a combined harpsichord-piano and a down-striking hammer action which could be added to any harpsichord.<sup>60</sup> These two inventions are described in the following extract from the patent specification:

... a new kind of Compound Harpsicord in which besides the Jacks with Quills a Set of Hammers of the Nature of those used in the kind of Harpsicords called Piano Forte are introduced in such manner that either may be played separately or both together at the Pleasure of the Performer and for adding the aforesaid Hammers to an Harpsicord of the Common kind already made so as to render it such Compound Harpsicord.<sup>61</sup>

One single-manual harpsichord survives with a hammer action added by Merlin. Now in the Boston Museum of Fine Arts, it was built by Jacob Kirckman in 1758 and altered by Merlin 1779.<sup>62</sup> The original disposition of the harpsichord,

60 *Patents for Inventions*, op. cit., 9f. The original manuscript application (quoted here) is to be found in The National Archives, Kew, London, signature: c210/15.

61 The words 'so as to render it such Compound Harpsicord' occur twice in the original manuscript application.

62 See: John Koster, *Keyboard musical instruments in the Museum of Fine Arts, Boston*, Boston 1994, 97–107. The instrument is no. 14 in the catalogue and has acc. no. 1977.56. The brief description here is based on my own observations.



retained by Merlin, comprises two 8-foot unisons and an octave. For the row of jacks nearest the player, Merlin substituted a new set of jacks which, while still capable of plucking one set of the 8-foot strings, could also activate the hammers, hinged in their own rail above the strings.

In a harpsichord with two sets of 8-foot strings, the two 8-foot strings for each note are widely spaced. In a piano, the two or three strings of each choir are placed close to each other (with the wider spaces between the choirs) to allow the hammers to strike them as a group. In order to incorporate his hammer action in the harpsichord by Kirckman, Merlin changed the arrangement of the strings from the wide pairs of a harpsichord to the narrow pairs of a piano. One set of the harpsichord jacks for the 8-foot strings remained as before the alteration. Those of the other set had to be angled suitably to pluck the other string of the narrow pair.<sup>63</sup> Merlin also added two pedals: the one on the left cumulatively engages the harpsichord stops in turn, that is, first one 8-foot stop, then the second 8-foot stop and finally the octave, to give a *crescendo*; the pedal on the right engages the piano action.

The two combined harpsichord-pianos built in their entirety by Merlin, one in private ownership in Switzerland (undated) and the other in the Deutsches Museum in Munich (1780), are two of the most ingenious combination instruments to have survived.<sup>64</sup> These single-manual instruments have a number of stops which can be combined to give different timbres. In both instruments the harpsichord has a 16-foot stop, for which the jacks have leather plectra, and an 8-foot stop and an octave, both quilled. The hammers of the down-striking piano action, activated by the harpsichord jacks for the 16-foot stop, can strike the same 16-foot and 8-foot strings used by the harpsichord action as well as another set of 8-foot strings, reserved for the hammers only. The hammers are covered with one thin layer of compact red leather, quite hard and with the smooth side out. A buff stop called the 'Welsh Harp' can be applied to the 16-foot strings whether these are struck by the hammers or plucked by the leather plectra, or indeed when they are plucked and struck simultaneously. A sustaining device called the 'Celestiale Harp' raises the dampers from all the 8-foot strings, also whether they are being plucked or struck, or again when

63 Merlin, keeping the keys below the larger spaces between the strings, retained one more-or-less vertical jack and had the other one rise at an angle large enough to reach the next wide space. The 4' strings, at a lower level, and their jacks could remain where they were. Davis, in his patent specification, had each key directly under its narrow choir of three strings with both sets of jacks at a lesser angle. Merlin's two combination instruments have a similar arrangement to that in the Davis patent specification in this respect.

64 The instrument dated 1780 is in the Deutsches Museum, Munich, acc. no. 1915-43872. The undated instrument is in private ownership in Switzerland. I am grateful to Pierre Goy for bringing the latter instrument to my attention and for taking me to see it. The idea mentioned in the catalogue of the Deutsches Museum that more combined harpsichord-pianos by Merlin are known to survive is a misunderstanding.



they are being both plucked and struck simultaneously. The damper cloths are attached to the harpsichord jacks for the 8-foot strings and each reach out over both 8-foot strings of the respective choir whether the jacks are engaged to pluck or not. The sustaining device lifts the jacks just high enough to raise the damper cloths off the strings but to leave the plectra under the level of the strings so that they can still be plucked. A similar sustaining device was noted above in the 1777 instrument by Tornel.

All these stops on Merlin's two surviving 'Compound Harpsicords' are more than enough to support his claim in an advertisement of the late 1770s for his 'superb *Patent Double Bass Pianoforte-Harpsichord*, with twenty different Stops'. By the latter he must have meant twenty different combinations of stops.<sup>65</sup>

In both the harpsichord-pianos by Merlin the 8-foot unison stop and the octave stop for the harpsichord are engaged using two knobs placed on the left in the key well and which bear the names 'Unison' and 'Octave'. The Celestiale Harp and the Welsh Harp have similar knobs on the right bearing their respective names. The undated instrument has two pedals: the one on the left engages the jacks for the 16-foot strings; the one on the right engages the hammer action, either above both sets of 8-foot strings or above these and the 16-foot strings as well.<sup>66</sup> In addition to the two pedals there are two knee levers. The left knee lever doubles the function of the left pedal, engaging the 16-foot harpsichord stop, while the one on the right disengages the piano action. The dated instrument (1780) has a similar configuration of stops, hand levers and pedals but no knee levers. There is however a third pedal with which the piano action can be disengaged by degrees, first so that the hammers no longer strike the 16-foot strings and both sets of 8-foot strings but only both sets of 8-foot strings, then just a single set of 8-foot strings and finally no strings at all, leaving on any harpsichord stops which had previously been engaged.

In these two combination instruments, each of which has just one keyboard, it is thus possible, while playing, first, to engage and disengage the piano action, second, to choose how many strings the hammers strike and third, to engage or disengage the 16-foot harpsichord stop. It would also have been possible to regulate the volume produced by the leather plectra for the 16-foot strings by careful use of the appropriate pedal while playing. By pressing the pedal gradually, the extent to which the plectra protruded under the strings would have increased, thus making a *crescendo*; releasing the pedal slowly would

65 Quoted in: French *et al.*, *John Joseph Merlin*, *op. cit.*, 90. Theoretically, seven stops allow 2<sup>7</sup> or 132 different combinations, far more than the twenty different stops advertised by Merlin.

66 This system, operated by pulleys, strings, levers and springs, was not completely clear in its function when I examined it. It may originally have worked in the same way as the system in the instrument in Munich.





Figure 4: The undated harpsichord-piano by Merlin in private ownership in Switzerland. The stop knobs for the Vnison (8-foot) and Octave (4-foot) harpsichord stops can be seen on the left, those for the Welsh Harp (the buff stop for the 16' strings) and the Celestiale Harp (the sustaining mechanism for the two 8' unisons) on the right.



have given a *diminuendo*. By contrast, the 8-foot and octave harpsichord stops, the buff stop for the 16-foot harpsichord strings and the damper-lifting device could only be engaged or disengaged at suitable breaks in the music using the hand-operated levers. In most English square pianos of the period the buff stop and the dampers are also operated by hand.

## Apotheosis

In a number of cosmologies the world was thought to have been made by a deity who must have created the best of all possible worlds, a world which therefore contained the greatest possible variety.<sup>67</sup> For instance, the revival of Platonism in the Italian Renaissance, led by Marsilio Ficino, propounded the idea that the teeming plenitude of the world around us was the work of the god-head, the so-called Demiurge, who through his goodness had made all manner of different beings to fill a vast and wonderful hierarchy, a great chain of being stretching from the lowest of the mundane to the highest of the celestial. The variety ranged from stones to plants, flowers and trees, to fish, animals and birds, to the lower ranks of heavenly beings, to the angels above them, to the archangels and finally to the divinity at the pinnacle of the whole. Man alone occupied a special place; he had the freedom to move within the marvellous structure, to choose his direction and place, to attain apotheosis or to be weighed down by his miserable passions into the abyss.<sup>68</sup>

Although adopted by some Christian believers and often reflected in orthodox Christian thought, some of the Platonic ideas, at least as they were developed in the Renaissance, were considered heretical by the Christian authorities. Unlike the Christian Creator, the Platonic Demiurge was not all-powerful but had to work with the recalcitrance of primeval matter. The potential friction between the Renaissance Platonist and the dogmatic Christian sometimes became evident in their approaches both to freedom and to creation. Plato had likened the work of the Demiurge to that of a carpenter, hampered at times by the irregularities of his wood. The Renaissance Platonists not only adopted this idea (if not always its implication regarding the omnipotence of the deity) but

67 This section was inspired by: Arthur O. Lovejoy, *The great chain of being. A study of the history of an idea*, Cambridge, Massachusetts, 1936.

68 The freedom of man in the chain of being is eloquently described by Giovanni Pico della Mirandola. See: Giovanni Pico della Mirandola, 'Oration on the dignity of man', in: Ernst Cassirer, Paul Oskar Kristeller and John Herman Randall (eds.), *The renaissance philosophy of man*, Chicago & London, 1948, 223–254. Pico was a friend of Ficino. For many years Pico was in conflict with the papal authorities; they considered a number of his ideas to be heretical.



also the idea that man had the freedom to ascend the great chain of being. The consequences for man were as momentous as those for the deity, but in man's case to his possible advantage; the Platonic artist at work had the freedom to rise to imitate or even share in divine creation, to add to the plenitude and variety at least intended, if never fully realized, by the deity. In opposition to these ideas, the orthodox Christian Creator, alone in his omnipotence, must of himself and because of his perfect goodness have entirely filled the best of all possible worlds. No mere human could add to the plenitude, already completed in a manner beyond human understanding, by the all-powerful himself; human artistic creation could never be equated with God's divine work and must be of a lower, mundane order.

We note then two principles at work in the Italian Platonist thinking of the Renaissance. First, one result of the divine creation of the world is that it is characterized by fullness and diversity; second, man has the freedom to rise to a position in which he can take part in the divine creation, a principle which can be considered heretical in that it allows man qualities normally reserved only for the divine. John Joseph Merlin appears to have been imbued by these principles, both in his work and in his life. He made an extraordinarily wide range of inventions, from roller skates to invalid chairs and from fine watches to automated carriages. His 'Compound Harpsicords' exhibit in themselves a delight in variety. Not only do they each contain a harpsichord with various strings and two different sorts of plectra but also a piano in which one, two or three strings can be struck by each hammer. There is also a buff stop for the 16-foot strings and a sustaining device for the 8-foot strings.

If the principle of plenitude is illustrated in Merlin's inventions, the principle of freedom is exhibited in Merlin's movement within society. He appears to have used his charisma and charm together with an allowance of individualism and wit to avoid any set predicament within the hierarchy of the English social structure; his life was not some hypocritical presentation of position, not fixed or pretentious. Rather, Merlin seems to have been himself, whether with the young Sarah Slater, the delightful daughter of the stable keeper whose premises backed onto Merlin's garden, or at Charles Burney's table teasing his daughter Fanny with his 'undisguised freedom of speech' on all subjects, whether as a tradesman's apprentice or sitting for Gainsborough to be painted like an aristocrat, whether in his guise as the ingenious mechanic or as the reincarnation of Britain's ancient magician himself.<sup>69</sup>

The commonly held view that Merlin made use of his status as a foreigner and his so-called eccentricity to infiltrate the gentry and the aristocracy in order to gain them as clients seems ill-fitting and inappropriate for a man of such

69 This sketch is gleaned from: French *et al.*, *John Joseph Merlin*, *op. cit.*



sparkle and imagination. His movements in society were, I believe, an expression of his spirit of freedom, the same that fired his ingenuity and his creativity. The best-known anecdote which can be interpreted to illustrate both points of view is that of Merlin's arrival at one of the famous – or infamous – masquerades given by the Viennese adventuress Theresa Cornelys at Carlisle House in London in the 1760s and 1770s.<sup>70</sup> These masquerades were highly fashionable at the time and attracted all levels of society, from a hurdy-gurdy player with his dancing bear at one extreme to members of the Royal Family at the other. In 1825 Thomas Busby wrote up the story of Merlin's appearance on one of these occasions as follows:

One of his ingenious novelties was a pair of skaites contrived to run on small metallic wheels. Supplied with a pair of these and a violin, he mixed in the motley group of one of the celebrated Mrs. Cornelys' masquerades at Carlsisle-house, Soho-square; when, not having provided the means of retarding his velocity, or commanding its direction, he impelled himself against a mirror, of more than five hundred pounds' value, dashed it to atoms, broke his instrument to pieces, and wounded himself most severely.

Probably the only surprise to Merlin was that he injured himself, if indeed he did, which I doubt. And surely the last thing a creator approaching the status of the divine would need would be brakes. What could have been closer to his spirit of freedom and creation than literally gliding through the echelons of society, combining the use of one of his inventions, a pair of roller skates, with a performance on the violin, and breaking through a mirror, that decorated symbol of vanity? As the metaphysical poet George Herbert (1593–1633) wrote in *The Elixir*:

A man that looks on glass,  
On it may stay his eye,  
Or if he pleaseth, through it pass,  
And then the heavens espie.

70 See: French *et al.*, *John Joseph Merlin*, *op. cit.*, 115–8.