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Johann Andreas Stein and the search for the expressive *Clavier**

Michael Latcham

It was a miracle of rare device,
A sunny pleasure-dome with caves of ice!

from: Samuel Taylor Coleridge, *Kubla Khan*, probably 1798

Johann Andreas Stein was born on the 6th of May 1728 in Heidelsheim near Karlsruhe and died on the 29th of February 1792 in Augsburg (ill. 1).[1] His initial training, as an organ builder, was with his father, Johann Georg Stein (1697–1754).[2] On the 1st of August 1748, the day Johann Andreas left home on his journeyman's travels, he bought a notebook in Karlsruhe.[3] The notebook, still preserved today, includes poems, sketches, anecdotes, descriptions of his journeys, brief references to the pianos of other makers including Bartolomeo Cristofori (1655–1731) and Franz Jakob Spath (1714–1786), and much other interesting material such as stringing schemes for harpsichords, pianos and clavichords. Stein used the notebook until at least 1777.

As a journeyman Stein spent nearly a year in the Strasbourg workshop of the brothers Silbermann, Johann Andreas (1712–1783), Johann Daniel (1717–1766), Johann Gottfried (1722–1766) and Johann Heinrich (1727–1799). In the notebook Stein wrote that he arrived there on the 4th of August 1748, three days after leaving home.[4] Johann Andreas and the youngest brother Johann Heinrich were

* Eva Hertz used the term *Expressivklavier* in her inspired study of Stein. See: Eva Hertz, *Johann Andreas Stein (1728–1792). Eine Beitrag zur Geschichte des Klavierbaus*, Wolfenbüttel and Berlin 1937, 44 and 53. The author would like to acknowledge his debt to that study.

1 In this essay, all translations are by the author unless otherwise stated. In the translations, any words such as *Piano forte* left not translated have been given in italics.

2 Stein was baptized Johann Georg Andreas Stein. Usually called Johann Andreas in the literature, he is sometimes referred to as Georg Andreas. For further biographical details on Stein see: Hertz, *Johann Andreas Stein*, *op. cit.*

3 « Georg Andreas Stein Von Heÿdelsheim den i Augustus 1748 En ce jour que je m'en suis allé quiter mon peis Je acheté ce livre a CarlsRuhe pour un demi florin. » Johann Andreas Stein's notebook, unpublished manuscript (hereafter *The Stein notebook*), 1. I am much indebted to Wolfgang Streicher for granting me access to the notebook and for allowing me to publish material from it. *The Stein notebook* was paginated in the twentieth century. The page numbers are used here. In my transcriptions I have followed Stein's spelling and punctuation.

4 « Strasbourg Je suis arrive le 4 me jour de mois d'Aout 1748. » See: Stein, *The Stein notebook*, *op. cit.*, 9. As mentioned by Eva Hertz (see: Hertz, *Johann Andreas Stein*, *op. cit.*, 2), the arrival of Stein was noted by Johann Andreas Silbermann in his catalogue of organ makers: „Aô: 1748. den 4 Augusti kam derselbe [Stein] zu meinem Bruder Daniel in Arbeit." (On the 4th of August 1748 the same [Stein] came to work for my brother Daniel.) See: Johann Andreas Silbermann,

away in Colmar tuning an organ so Stein started work with Johann Daniel, eleven years his senior. Stein was allowed to sit at table with Johann Daniel after the other journeymen had been obliged to leave the room.[5] This was mentioned in a letter to his father written by Stein in the first weeks of his work, that is, before Johann Andreas and Johann Heinrich returned from Colmar. When they came back, Johann Andreas, the eldest brother and presumably the leader of the firm, may well have taken over as Stein's master.

In the notebook, the entries that appear to be from Stein's time in Strasbourg and that refer to musical instruments only concern organs; no mention is made of pianos. There is also no evidence to show that the four Silbermann brothers made any *Hammerflügel* in the year in which Stein was with them. It thus seems unlikely that Stein ever saw *Hammerflügel* in the Strasbourg workshop. Nonetheless, some features of the piano of his 1777 *Vis-à-vis* harpsichord-piano suggest that Stein was influenced either by the *Hammerflügel* made by the uncle of the four Silbermann brothers, Gottfried Silbermann (1683–1753) in Freiberg, Saxony, or perhaps by those made by Johann Heinrich. Johann Heinrich was however only one year older than Stein, so it seems more likely that they were both directly inspired by the instruments of the older Gottfried, either in or after the year in which Stein arrived in Strasbourg, 1748, perhaps on a visit to Freiberg, perhaps elsewhere. Johann Heinrich, whose piano actions are remarkably similar to those of his uncle Gottfried, is said to have worked as a fifteen-year-old in his uncle's workshop in Freiberg for a year starting in 1742. Nonetheless, it may not have been then that Johann Heinrich saw the piano action he copied from his uncle; by that year Gottfried Silbermann may not have begun to make the *Hammerflügel* for which he became so famous; the earliest of these that still survives is dated 1746.[6]

„Bericht von Orgelmachern auch Organisten welche sich auf Orgeln verstanden, oder vielmehr haben verstehen wollen", in: Marc Schaefer (ed.), *Das Silbermann-Archiv. Der handschriftliche Nachlaß des Orgelmachers Johann Andreas Silbermann (1712–1783)*, Winterthur 1994, 311. The distance between Heidelsheim and Strasbourg is 117 km, so using the full four days he could have walked.

5 One other journeyman was also allowed to stay. J. A. Silbermann relayed the contents of a letter Stein wrote to his father. The letter included the following: „Straßb den 11 Aug 1748 [...] Ich darf mich rühmen daß er [Johann Daniel] mich sehr lieben mus weilen allemahl nach geschehener Mahlzeit die Ehre habe bey ihme zu bleiben und mit einander discuriren wo die andern Gesellen zur Thür hinaus müßen obwohl auch ein Orgelmachers Gesell dabey ist, der Herr siehet aber wohl daß ich auch etwas im Copff habe. Der älteste und jüngste Herr seyn nicht zuhauß, sie seyn nacher Colmar geholt worden um aldort ein Werck abzustimmen, und habe sie noch nicht gesehen." (I may praise myself that he appreciates me very much because always when the meal is finished I have the honour to stay with him and to converse together whereas the other journeymen have to go out although one other organ maker's journeyman is also there, the master probably sees I have something in my head. The oldest and the youngest master are not at home, they have gone to Colmar to tune an organ there and I have not yet seen them.) See: J. A. Silbermann, „Bericht von Orgelmachern", *op. cit.*, 312.

6 Three pianos by Gottfried Silbermann survive: *circa* 1746, Stiftung Preußische Schlösser und Gärten, Potsdam, Neues Palais (inv. no. V 12); 1746, Stiftung Preußische Schlösser und Gärten, Potsdam, Sanssouci (inv. no. V 13); 1749, Germanisches Nationalmuseum, Nürnberg

Illustration 1: An anonymous oil portrait, probably of Johann Andreas Stein as a young man (Private collection, Augsburg)

According to his notebook, Stein left the Silbermann workshop on the 7th of June 1749, ten months after he had arrived.[7] Later, he spent some months with Franz Jakob Spath in Regensburg. He arrived there on the 16th of October 1749.[8] Between the Silbermann workshop and that of Spath, and between the Spath workshop and settling down in Augsburg in about May 1750, Stein's journeys took him through numerous towns; in some of these he undertook work with organ builders and in others he appears to have taken on work directly for local church authorities. On his travels he also wrote down comments on the beauty of some of the women he saw; he was twenty-two years old at the time.

Some of the drawings of piano actions in Stein's notebook appear to have been entered either just before he arrived in Regensburg or during the time he spent there with Spath. One entry in the notebook shows Stein's awareness

(inv. no. MI 86). Another, destroyed by fire after a bombing raid in 1945, stated in some sources to have been dated 1747, was to be found in the Stadtschloß in Potsdam. The three Potsdam *Hammerflügel* by Gottfried Silbermann were owned by Frederick the Great. For a discussion of these *Hammerflügel* see: Latcham, *'Pianos and harpsichords for Their Majesties'*, *op. cit.*, 379–87. Of the two *Hammerflügel* by Johann Heinrich Silbermann, one, dated 1776, is now in Berlin (Musikinstrumenten-Museum, inv. no. 12), the other, undated, is in private ownership in Switzerland.

7 « le 7 Juni eu mon congé et paye tout; j'étais le dernière fois dans la Comédie Français den 9. Juny 1749ig quitirt ich Straßburg. » Stein, *The Stein notebook*, *op. cit.*, 11.

8 « 1749 le 16 jour du mois 8br. je m'on suis arive à Regenspurg et on suiter jour comance travailler chez Mr. Franz Spath. » *Ibid.*, 52.

(through secondary sources) of Cristofori's first hammer action and of the giant hammered dulcimer, known as the *Pantalon*, made by Pantaleon Hebenstreit (1667–1750).[9]

Stein's notebook contains a list of thirty stringed keyboard instruments he had made in Augsburg (ill. 2) after he had arrived there.

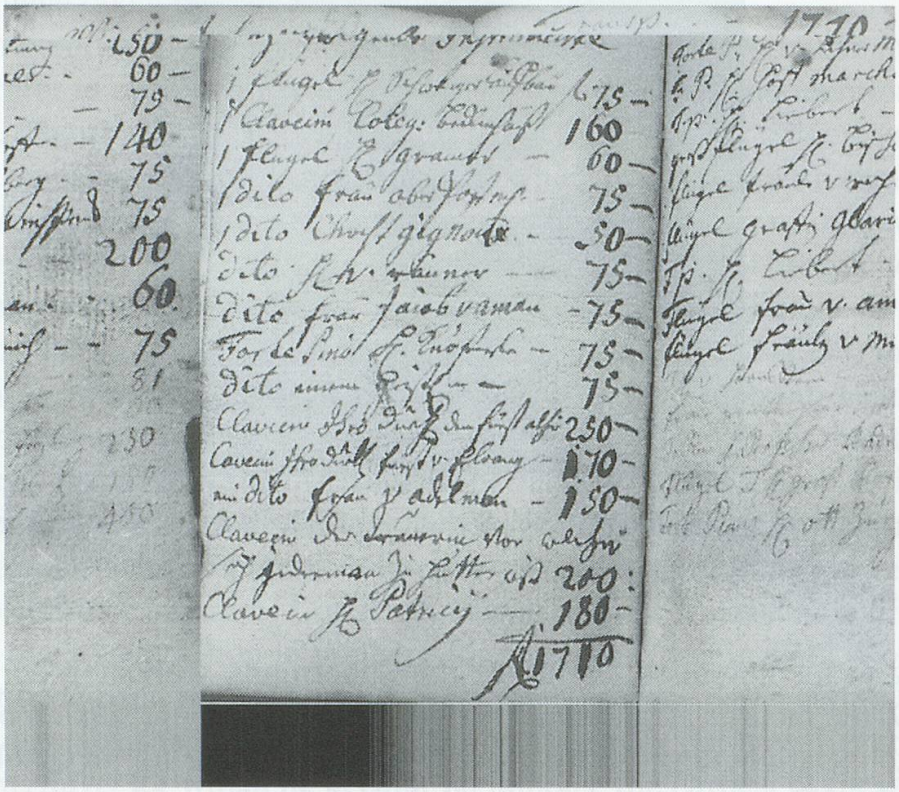

Illustration 2: The list of instruments Stein had made since he came to Augsburg 1750 as given in his notebook on pages 238 and 239

Although his sentence at the top of the list mentions the date of his arrival as 1749, the accounts he kept of his earnings at Spath's workshop indicate that he was in fact in Regensburg until the Spring of 1750.[10] Stein's list of instruments is

9 „Florinto Bartholome Christofilÿ einem bey dem groß Hertzog in diensten stehenden Claviermacher aus Badua geburthig hat die Ehre diesen erfunden zu [?] haben. Es schreibt H. Matthesson an H. Kuhnau nach Leipsig. Es hatte ihn damals schon die viele arbeit abgeschreckt an dem Phantolon. Sonst wäre die anlockung des schönen summenden Klangs wie ein sirenen gesang da er sagt auch dass er weil es darm Saiten immer viel zu corigeren findet. Weiter sagt er, es ginge an wann man sich wie Mr Bandolon nur selten und etwa auf ein halb stündgen hören Lassen, dürfte dabey auch sowohl fürs Stimmen als für spiehlen gelohnt würde. er haißt mit seinem rechten Nahmen Hebenstreit. Konig Louis XIV in Frankreich soll das Instrument getaufft und Pantolon genennet haben. Critica Mus. Pag. 248". Stein, *The Stein notebook*, *op. cit.*, 112–3. I am grateful to Michael Ladenburger for helping to transcribe this passage.

10 „Als ich im Jahr 1749 nacher Augsburg kam so verfertigte ich folgende Instrumente". (Stein, *The Stein notebook*, *op. cit.*, 238.) The 49 has been crossed out in pencil and 50 inserted in a later hand, presumably for the same reasons as those outlined here: on page 53 of *The Stein notebook* Stein's list of his earnings continue into early 1750.

obviously retrospective, but because he often did not use the pages of the notebook consecutively it is difficult to estimate the date or dates on which the list was compiled. Nonetheless, pages 238 and 239, on which the list of instruments is written, are reasonably close to page 283, a page that includes the latest date to be mentioned in the notebook, 1777. These facts suggest that the thirty listed instruments may represent all the stringed keyboard instruments, excepting clavichords, that Stein made between 1750 and about 1777.

The names of the instruments on the list are transcribed below with the prices (most likely in florins) Stein noted for them. The instruments appear to have been entered in groups, perhaps on different occasions. The first group, on page 238, comprises the following:

Flügel	*75,–*
Clavecin	*160,–*
Flügel	*60,–*
dito	*75,–*
dito	*50,–*
dito	*75,–*
dito	*75,–*
Forte Pino [sic]	*75,–*
dito	*75,–*
Clavecin	*250,–*
Cavecin [sic]	*170,–*
dito	*150,–*
Clavecin	*200,–*
Clavecin	*180,–*

Those of the next group, on page 239, appear from the handwriting to have been entered at the same time as those on page 238:

Clav.	*200,–*
Forte P.	*200,–*
Forte P.	*250,–*
F P.	*60,–*
F.p.	*75,–*
gross flügel	*140,–*
flügel	*75,–*
flügel	*75,–*
Fp	*200,–*

The handwriting then changes slightly for the next two entries:

Flügel	*60,–*
flügel	*75,–*

Finally a group of five entries in pencil:

F	*81,–*
–	*60,–*

Fo pian	*230,–*
Flügel	*150,–*
Forte Piano	*400,–*

Except for two instruments called *Forte Pino*, the first group comprises instruments called '*Clavecin*' and '*Flügel*'. It is generally accepted today that the term '*Flügel*' meant a plucked harpsichord in the late eighteenth century. '*Clavecin*', on the other hand, was used for both the plucked harpsichord and the hammered harpsichord, that is, for the *clavecin* and for the *clavecin à piano et forte*. Arguably however, Stein used the name *Clavecin* to mean only the plucked variety. After all, the two distinct price classes for pianos (*Forte pino*, *Fp.* and others) suggest two classes of instruments, the more expensive *Hammerflügel* and the smaller, less expensive instruments, either square pianos or perhaps those called in the modern literature *liegende Harfe* pianos, instruments made in a shape similar to that of a bentside spinet or a harp lying on its side. If the different types of piano available in those days are thus all covered by terms like *Forte Piano* and *F.p.* in the notebook, the term *Clavecin* probably meant a plucked harpsichord for Stein.[11] In that case Stein had two names for the plucked harpsichord, *Clavecin* and *Flügel*. Perhaps to him *Clavecin* meant a French-style instrument while *Flügel* meant a German-style one; he certainly made both types, evidenced by the German-style harpsichord in the 1777 *Vis-à-vis* and the French-style harpsichord in the 1783 *Vis-à-vis*, both described below. The differences in the prices among the *Clavecins* and *Flügel* suggest that Stein made some harpsichords with one keyboard and others with two or more, although other differences, perhaps the external decoration, could also explain the variation in price. Nothing in the list immediately suggests that Stein made spinets unless the wing-shaped lid of a bentside spinet would make it a *Flügel*.

At the beginning of the list, plucked harpsichords predominate while towards the end there are more pianos, at least, if the above analysis is correct. The last item on the list, a *Forte Piano* costing twice the price of the most expensive of the other instruments, may have been a special instrument, perhaps a *Claviorganum*, combining a *Hammerflügel* with an organ, or perhaps a *Hammerflügel* combined with a harpsichord. As will be seen below, Stein made examples of both these types of instrument.

The sort of action of the pianos on Stein's list cannot be determined. They might have had a *Stoßmechanik* (in which the hammers pivot in, or are hinged to, their own rail), probably without an escapement mechanism, or a *Prellmechanik* (in which the hammers either pivot in forks mounted on the keys or are attached to

11 Stein, *The Stein notebook*, *op. cit.*, 216–7. Stein's harpsichords were still recommended by Christian Friedrich Daniel Schubart (1739–1791) in his *Ideen zu einer Ästhetik der Tonkunst* (p. 287), written in 1784/5 in prison and published posthumously in 1806. Schubart had a predeliction for the clavichord. On page 284 of the *Notebook* Stein gives a stringing list for a *Forte Piano petit*. The notes FF to C were to have covered strings and gauge 6 was to start at d♯3, suggesting that the range was FF to f3.

the key in some other way), again probably without an escapement mechanism. But there is no evidence that Stein had invented his German action before 1781 and thus no reason to suppose any of the pianos mentioned in the notebook had that action.

Stein was an organ maker, as were his two masters, Johann Andreas Silbermann and Franz Jakob Spath. Stein was also an accomplished organist, as were other keyboard instrument makers, certainly including Spath and most probably Silbermann as well. Stein played in the *Barfüßerkirche* in Augsburg. The magnificent organ he completed in 1757 for that church was destroyed in the Second World War (ill. 3).[12] Furthermore, an organ by Stein of 1763 survives in the St. Thekla church, Welden, not far from Augsburg.[13] Although there is thus good evidence for Stein's activities as an organ maker after 1750, he did not include any organs on the list of instruments in the notebook. Similarly, although he certainly made clavichords before and after 1777, not one is included on the list.

Gerber wrote in his *Lexikon* of 1813/14 that more than seven hundred instruments by Stein were dispersed in Europe.[14] If this is true, and if Stein only produced thirty stringed keyboard instruments, excluding clavichords, between 1750 and 1777 (those on the list), he produced more than six hundred between 1777 and his death in 1792, an average of more than forty a year. This might make Stein seem to have been extraordinarily prolific; there were however Viennese builders in the next generation who made instruments at comparable yearly rates. In the early nineteenth century, Stein's daughter Nannette Streicher (1769–1833), after moving to Vienna in 1794, continued the activities of her father's firm, producing more than a hundred *Hammerflügel* a year.[15] Ferdinand Hofmann (1757–1829)

12 For a contemporary description and full specification, see: Anonymous, 'Nachricht. Von einer neu erbauten Orgel, aus dem 6ten Stück der Augspurgischen Kunst-Zeitung, den 5ten Febr. 1770', *Musikalische Nachrichten und Anmerkungen*, xi (1770), 86–8, xiv (1770), 108–9. Photographs of the instrument exist in the *Barfüßerkirche* in Augsburg. There were three manuals and a pedal. The *Hauptwerk* had a 16' stop, seven 8' stops, four 4' stops, a 3' stop, a 2' stop, a mixture (4–8 ranks) and a 1' stop. The *Oberwerk* had six 8' stops, two 4' stops, a 3' stop, a 2' stop, a 1' stop and a 2' carillon. The *Brustwerk* was still being built when the description was written and was to have „... 6 besondere, und zum affectuösen Spielen bestimmte Register." (6 special stops intended for expressive playing.) The *Pedal* had three 16' stops, three 8' stops, a 4' stop and a 2' stop. All the manuals and the pedal could be coupled.

13 The organ has a single manual: C-c3, *Coppel* 8', *Waldflöthen* bass 8', *Waldflöthen* treble 4', *Prinzipal* 4', *Flöthen* 4', *Quint* 3', *Mixtur* 4 rank; and a pedal: C-g, *Subbaß* 16'. See: Georg Brenninger, *Orgeln in Schwaben*, Munich 1986, no. 38, pp. 132 and 137).

14 „Von seiner Melodika und seinen Pianofortes sind über 700 in ganz Europa verbreitet." Ernst Ludwig Gerber, *Neues historisch-biographisches Lexikon der Tonkünstler*, 4 vols., Leipzig 1813/14, IV, col. 264. The *Melodica* (Stein's spelling) was a small organ, placed on top of the piano or harpsichord, capable of dynamic variation through touch. See below. It seems unlikely that Gerber's remarks were based on his own first-hand knowledge, however, and he may have confused more than one source. Very few contemporary descriptions of the *Melodica* survive, unlike the numerous descriptions of Stein's *Hammerflügel*, so it is likely that the number 700 refers mainly to *Hammerflügel*.

15 For a full description of the firm's activities in the late eighteenth century and the early nineteenth century see: Michael Latcham, 'The development of the Streicher firm of piano builders

and his eight journeymen, also in Vienna, were reported to have finished one instrument every week in 1804.[16]

Stein certainly had journeymen working for him; Mathäus Schautz (1755–1831), Franz Joseph Wirth (1760–1819), Ignace Joseph Senft (*fl.* 1790–1817), Johann David Schiedmayer (1753–1805) and Jacob Friedrich Conrad (*fl.* 1793–1810) are five of the numerous instrument makers known to have worked with him.[17] Pianos by these five (and by other journeymen who were with Stein) have survived.[18] From the likelihood that they were with Stein in their twenties, their dates of birth suggest that they would have been at Stein's workshop from the 1770s onwards. This is certainly known to have been the case with some of his journeymen. Entries in *The Schiedmayer notebook* show that Johann David Schiedmayer started with Stein in 1778 as a twenty-five-year-old man and left when he was twenty-eight in 1781.[19] Schautz had left Stein's employment by 1783 when he was twenty-eight years old.[20] Although Stein could have had journeymen working for him during his early period in Augsburg, the evidence there is thus indicates that the journeymen who later became well known as piano makers

under the leadership of Nannette Streicher, 1792–1823' in Beatrix Darmstädter, Rudolf Hopfner and Alfons Huber (eds.), *Das Wiener Klavier bis 1850*, the proceedings of the symposium on the development of the piano in Vienna in the first half of the nineteenth century held in the Kunsthistorisches Museum, Vienna from 16 to 18 October 2003, Tutzing 2007, 43–71.

16 „Die interressantesten Orgelbauer und Claviermacher sind Anton Walter, der bey 20 Gesellen hält; Ferdinand Hoffmann [sic], welcher mit seinen 8 Gesellen auch auf jede Woche ein zu Stand gebrachtes Fortepiano rechnet; Johann Schanz, Joseph Donahl, Joseph Brodmann u. s. w." Josef Rohrer, *Bemerkungen auf einer Reise von der türkischen Gränze über die Bukowina durch Ost- und Westgalizien, Schlesien und Mähren nach Wien*, Vienna 1804, 288.

17 Although J. D. Schiedmayer appears to have had no journeymen working for him, the cases for his pianos were made for him and he did have three labourers working with him for relatively short periods. He produced a maximum of three instruments a year. See: Michael Latcham, 'The *Hammerflügel* of Johann David Schiedmayer', *Early Keyboard Journal* 23, 2005, 7–31. By contrast, it seems that Stein may have had at least half a dozen journeymen working for him at any one time during the latter part of his career.

18 For lists of the *Hammerflügel* made by Schautz, Wirth, Senft, J. D. Schiedmayer and other journeymen at Stein's, see: Michael Latcham, *The stringing, scaling and pitch of* Hammerflügel *built in the southern German and Viennese traditions, 1780–1820*, 2 vols., Munich & Salzburg 2000, I, xix-xx.

19 „Nach Augsburg kam ich zum zweÿten mahl den 11 Julli 1778 und den 17 kam ich beÿ H Stein in Arbeit." Johann David Schiedmayer and Johann Lorenz Schiedmayer, *The Schiedmayer notebook*, fol. 6r., transcribed and translated in: Preethi de Silva, *The fortepiano writings of Streicher; Dieudonné and the Schiedmayer: two manuals and a notebook, translated from the original German, with commentary*, Lewiston 2009. Later, a facsimile edition of the *Schiedmayer notebook* edited by the present author will appear followed by a similar facsimile edition of the *Stein notebook*.

20 „Ein Schüler von Herrn Stein, Hr. Matthäus Schauz von Sontheim an der Brenz, hat sich im Jahr 1783. hieher gesetzt, und verfertiget gute Piano forte, Claviere und andere dergleichen Instrumente." (A pupil of Herrn Stein, Hr. Matthäus Schauz of Sontheim an der Brenz settled here in 1783 and makes good *Piano forte*, *Claviere* and other such instruments.) Paul von Stetten the Younger, *Kunst- Gewerb- und Handwerks-Geschichte der Reichs-Stadt Augsburg, Zweiter Theil oder Nachtrag*, Augsburg 1788, 56.

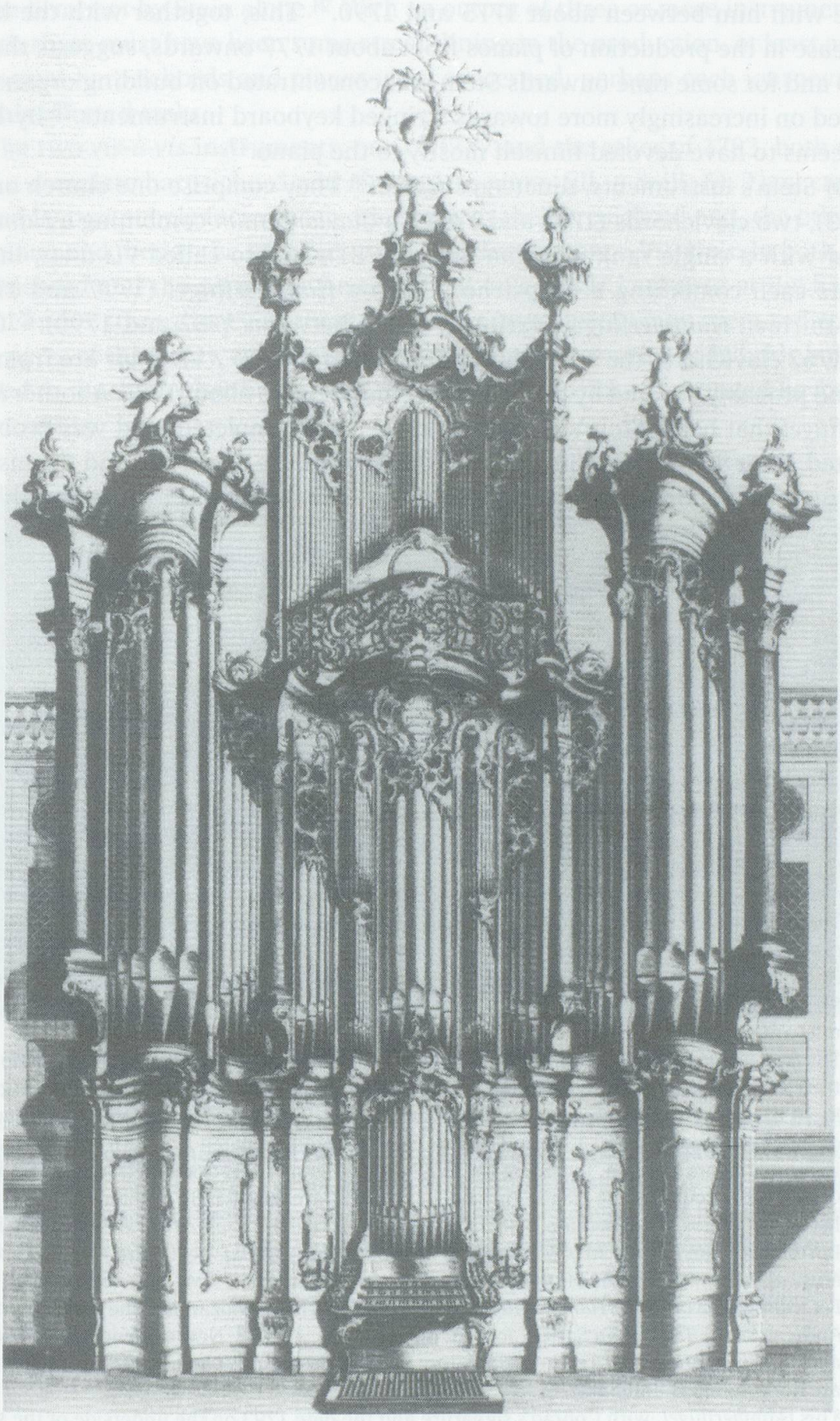

Illustration 3: The organ built by Stein for the Barfüßerkirche in Augsburg between 1755 and 1757. Stein was also the organist in the church. Etching. (Private collection)

were with him between about 1775 and 1790.[21] This, together with the large increase in the production of pianos from about 1777 onwards, suggests that in 1750 and for some time onwards Stein still concentrated on building organs but moved on increasingly more towards stringed keyboard instruments.[22] By 1775 he seems to have devoted himself mostly to the piano.[23]

Of Stein's instruments, nineteen survive.[24] They comprise one church organ (1763), two clavichords (1762 and 1787), a *Claviorganum* combining a *Hammerflügel* with a single rank of organ pipes (1781), two so-called *Vis-à-vis*, instruments each combining a harpsichord with a *Hammerflügel* (1777 and 1783), and thirteen *Hammerflügel* (variously dated between 1782 and 1790).[25] Only the 1762 clavichord, the 1763 church organ and the 1777 *Vis-à-vis* are from the period probably covered by the notebook, that is, up to about 1777. Another *Hammerflügel* that bears Stein's label must have been completed, and was probably started, after Stein's death in 1792. The label gives the date 1794 and the inscription under the soundboard includes the date 1793.[26] Then as now, it would have been normal to continue to use the name of the firm – in this case *Jean André Stein* – after the death of the founder; furthermore, the instruments were made

21 Stein himself left his last master (Spath) in the month he became twenty-two.

22 Georg Brenninger mentioned a letter by Stein of the 20th of June 1779 in which he noted that he had not made organs for 15 years „um seine Kräfte denen Saiten Instrumenten allein zu widmen". See Brenninger, *Orgeln in Schwaben*, *op. cit.*, p. 34.

23 Evidence from Schiedmayer and Schiedmayer, *The Schiedmayer notebook*, *op. cit.*, folios 18r. to 23r. indicates that while J. D. Schiedmayer was with Stein from 1778 to 1781 as a journeyman, his duties included tuning unspecified instruments, tuning and voicing harpsichords, making small repairs to instruments and delivering instruments including, on one occasion, an organ. The instruments involved included harpsichords and possibly *Hammerflügel*, probably clavichords and possibly smaller instruments, perhaps spinets, square pianos or so-called *Liegende Harfe* pianos, those in the shape of a bentside spinet. See De Silva, *The fortepiano writings of Streicher; Dieudonné and the Schiedmayer*, *op. cit.* for a transcription and translation of the relevant pages.

24 The fretted clavichord (C-f3, C-H single strung, c-f3 double strung) by Stein known as Mozart's travelling clavichord (Hungarian National Museum, inv. no. 1965.42) is of 1762, the organ by Stein in the St. Thekla church, Welden is dated 1763 (see: Brenninger, *Orgeln in Schwaben*, *op. cit.*, no. 38, pp. 132 and 137) and the *Vis-à-vis* in Verona is dated 1777. All the other surviving instruments by Stein, including the 1787 single-strung unfretted clavichord (C-f3) in the Gemeentemuseum in The Hague (inv. no. 1933-0712) are dated 1781 or later. For a complete list of the pianos, see: Latcham, *The stringing, scaling and pitch*, *op. cit.*, I, xi. The piano in the Boston Museum of Fine Arts may have been a *Saitenharmonika*. See: John Koster, *Keyboard Musical Instruments in the Museum of Fine Arts, Boston*, Boston 1994, 133–46.

25 For a discussion of Stein's *Hammerflügel*, see: Michael Latcham, 'Mozart and the pianos of Johann Andreas Stein', *The Galpin Society Journal* LI, July 1998, 114–53. New evidence shows that the assertion in that article that the moderators in the 1777 *Vis-à-vis* and the 1781 *Claviorganum* are not original is untenable.

26 This *Hammerflügel*, with Conrad's signature and the date 1793 on the underside of the soundboard, bears a Stein label with the date 1794 and is in the Kunsthistorisches Museum, Vienna, inv. no. SAM 626. Another instrument by Conrad, dated 1801, is in the Museum Spaans Gouvernement in Maastricht, inv. no. 356.

by the firm, not by Stein alone.[27] With an output of three or more instruments a month there must have been some streamlining in the production, at least as far as normal harpsichords and pianos were concerned; perhaps each journeyman had his allotted tasks.

The two *vis-à-vis* instruments, one of 1777 and the other of 1783, both combine a complete harpsichord and a complete piano (ill. 4 & ill. 5). They can be played by two people facing each other, one at the harpsichord end, the other at the piano end, hence the name given to such instruments: *Vis-à-vis*. In both, the harpsichord and the piano can be combined on a single keyboard at the harpsichord end. Extraordinary as these particular instruments may seem today, the next parts of this essay will show that they are not curiosities or hybrids but are related to much of what had preceded them in the history of stringed keyboard instruments.

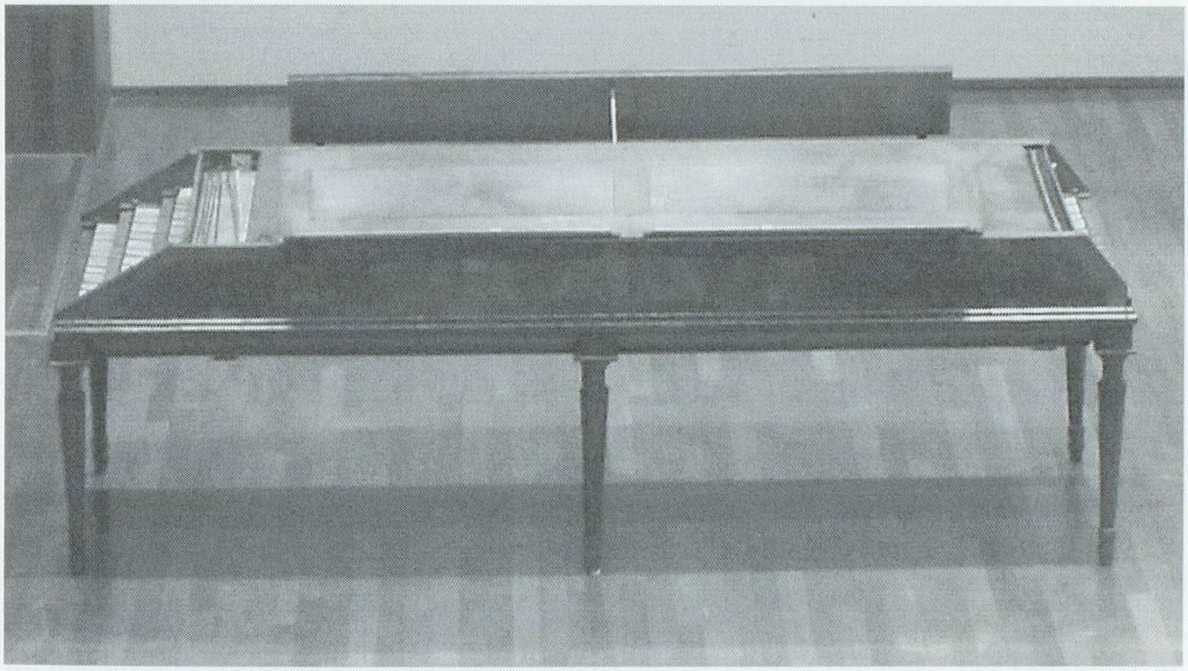

Illustration 4: The 1777 *Vis-à-vis* in the *Accademia filarmonica*, Verona, on loan from the *Museo di Castelvecchio*, Verona.
The two main lids fold in half in the middle and when raised and supported by their respective lid sticks (as shown here), can serve as music stands for a small standing orchestra. On the left three keyboards can be seen: the upper two for the harpsichord, the lower one for the piano at the other end and for coupling the piano and the harpsichord. At the right-hand end there is a single keyboard for the piano

27 Some of the instruments bearing the inscription 'Spath und Schmahl Regensburg' or variants thereof include in their inscriptions dates well after the death of Franz Jakob Spath in 1786.

In the last part of this essay a number of Stein's instruments, including the two *Vis-à-vis*, will be discussed in chronological order to illustrate the changes that apparently occurred between 1769 and 1783 in Stein's attitude to expression. As is clear from many written sources, not the least significant of which is Mozart's famous letter to his father of the 17th of October 1777, Stein was regarded in his day as the foremost keyboard instrument maker in the German-speaking world.[28] The changes that took place in his attitude to expression between 1769 and 1783 may therefore be taken to reflect some of the leading changes in ideas on expression, at least at the keyboard, that took place in Mozart's world during the same period, that is from when Mozart was thirteen to when he was twenty-seven years old.

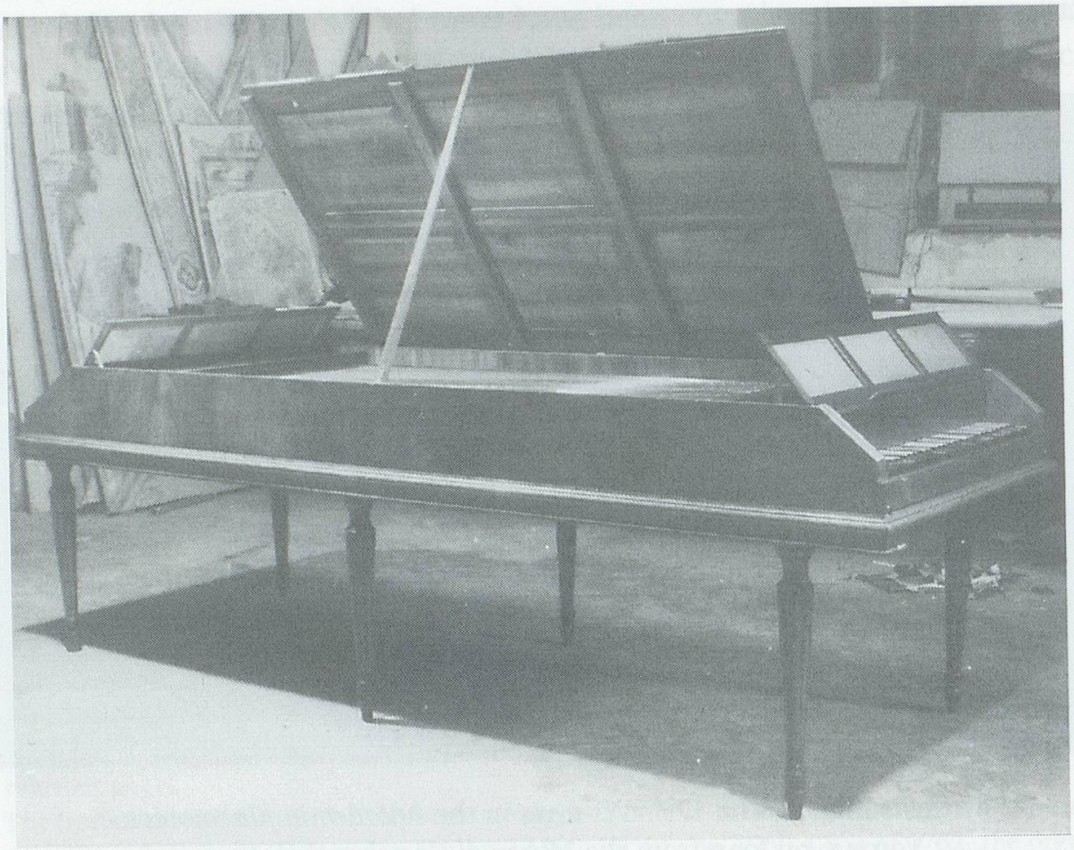

Illustration 5: The 1783 *Vis-à-vis* in the *Conservatorio di Musica San Pietro a Majella*, Naples. The piano end, shown here, has only one keyboard. At the other end there are two keyboards, the lower one for the harpsichord, the upper one for the piano and for coupling the harpsichord and the piano

28 The letter to his father of 17th October 1777 starts as follows: „Nun muß ich gleich bey die steinischen Piano forte anfangen. Ehe ich noch vom stein seiner arbeit etwas gesehen habe, waren mir die spättischen Clavier die liebsten; Nun muß ich aber den steinischen den vorzug lassen […]". (Now I shall begin right away with Stein's *Piano forte*. Before I had seen the work of Stein, Spath's *Clavier* were my favourites; now however I must give the preference to Stein's […].) Wolfgang Amadeus Mozart, *Briefe und Aufzeichnungen. Gesamtausgabe*, collected by Wilhelm A. Bauer and Otto E. Deutsch, 7 vols., Kassel, Basel, London, New York 1962–1975, II, 1962, 68. Stein's fame was considerable, during and after his lifetime. In 1833, Nannette Streicher's

The harpsichord and the piano in the eighteenth century

At the beginning of the eighteenth century, the harpsichord was of course well established, having already played an important part in secular musical life in the seventeenth century. The piano, on the other hand, did not emerge until the very end of the seventeenth century when Cristofori, working for Grand Prince Ferdinando de' Medici (1663–1713) in Florence, invented a hammer action for the harpsichord. Although the piano did not flourish in London and Vienna until quite late in the eighteenth century, hammered harpsichords – as they were often called – were certainly appreciated and used in other places and at various times throughout the eighteenth century. The piano found favour alongside the harpsichord in centres of cultural life, not the least of which were the courts of the Medici in Florence and of Cardinal Pietro Ottoboni (1667–1740) in Rome at the beginning of the century, the court of King João V of Portugal (1689–1750) around 1720, the Spanish court from 1730 to at least 1750, and the court of Frederick the Great of Prussia (1712–1786), probably from about 1745 until King Frederick's death.[29] These periods cover almost the entire eighteenth century.

In Florence, Grand Prince Ferdinando collected numerous instruments, old and new, including a number of spinets and harpsichords by such revered makers as Domenico da Pesaro (*fl.* 1533–1575) and Girolamo Zenti (*c.* 1610–1666).[30] The prince, himself an able keyboard player, particularly prized his new pianos by Cristofori and gave one of them to Cardinal Ottoboni in Rome. On writing to the prince to thank him for the gift, the cardinal wrote that the instrument was his favourite. The court of the young cardinal was renowned for its music. Arcangelo Corelli (1653–1713) lived at the cardinal's palace from 1690 to 1712 and wrote numerous pieces for performance there.

Domenico Scarlatti (1685–1757) and his father visited Prince Ferdinando in Florence in 1702 and again in 1705. Later, in 1719, Scarlatti was appointed by King João V to be in charge of the music at the court in Lisbon. His duties included teaching the king's daughter Princess Maria Barbara (1711–1758) at the keyboard. The king had a number of pianos by Cristofori, possibly acquired on the advice of Scarlatti. When Maria Barbara moved to Spain to marry the Spanish *Infante*, Prince Fernando, Scarlatti followed her and continued to be her tutor until his death in 1757. When Maria Barbara died in 1758, the list of her

husband Andreas wrote that „Nannette Stein[s] [...] Vater war Andreas Stein, mit vollem Rechte berühmt als gründlicher Klavier- und Orgelspieler; als Erbauer einer der herrlichsten Orgeln, als Erfinder einer Mechanik, die den rohen Pantalon in das jetzt überall eingeführte Pianoforte umwandelte; [...]." (Nannette Stein's father was famous, and quite rightly so, as a thorough keyboard player and organist, as the builder of one of the most wonderful organs, as the inventor of an action that transformed the raw *Pantalon* into the *Pianoforte* that is now established everywhere; [...].) *Allgemeine musikalische Zeitung*, June 5th 1833, col. 373–80.

29 See: Michael Latcham, 'Pianos and harpsichords for Their Majesties', *Early Music* XXXVI/3, August 2008, 359–96, here 372–87.

30 I am grateful to Giuliana Montanari for bringing these details to my attention.

keyboard instruments comprised seven harpsichords and five pianos.[31] Carlo Broschi (1705–1782), better known as Farinelli, who served the Spanish court from 1737 to 1758, inherited the three best of these, two harpsichords and one piano.

In Potsdam, Frederick the Great had inherited at least one harpsichord from his grandmother through his mother before he became King of Prussia in 1740. In that year he appointed Philipp Emanuel Bach (1714–1788) as his accompanist. Bach stayed with the King until he left for Hamburg in 1767. In that period, 1740 to 1767, King Frederick acquired at least three pianos by Gottfried Silbermann and probably at least three of the five harpsichords made by the Swiss Burkat Shudi the Elder (1702–1773) in London. The first is said to have been a gift to the King and the other four were ordered.

At these courts, the coexistence of the harpsichord and the piano was peaceful in the sense that there was no question of one of them taking over from the other. Nevertheless, the two instruments were certainly distinguished according to their different qualities and preferences for the one or the other were held. Scipione Maffei (1675–1755), for instance, remarked on the special technique required for playing Cristofori's pianos already in 1711 after seeing them in 1709.[32] Scarlatti may well have preferred the piano earlier in his career as the tutor of Maria Barbara but later, after she became the Queen of Spain in 1746, the harpsichord. Farinelli seems to have preferred the harpsichord for accompanying singers and the piano for playing solos.[33] For the regular evening concerts at Potsdam in which he played the flute, King Frederick was accompanied by Philipp Emanuel Bach on one or other of the Silbermann *Hammerflügel*; the harpsichords at Potsdam were apparently preferred for larger-scaled performances including those of operas. In the second part of his *Versuch*, Ph. Em. Bach expressed his preference for the piano for improvisation.[34] Other writers also had their likes and dislikes. Voltaire

31 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', in: Luisa Morales (ed.), *Five Centuries of Spanish Keyboard Music*, proceedings of FIMTE conferences 2002–2004, 255–81. Two of the five pianos were converted to harpsichords.

32 See: Scipione Maffei, "Nuova invenzione d'un Gravecembalo col Piano e Forte aggiunte alcune considerazione sopra gli strumenti musicali", *Giornale de' Letterati d'Italia 5*, Venice 1711, 144–59. "[...] *ma essendo strumento nuovo, ricerca persona, che intendene la forza vi abbia fatto sopra alquanto di studio particolare, così per regolare la misura del diverso impulso, che dee darsi a' tasti, e la graziosa degradazione* [...]." (But because it is a new instrument, it requires a person who understands its power, and above all who has made a special study of it and can thus control the measure of the various impulses that the keys require, and the charming shading [...].) It has been convincingly shown that Maffei's description of the instrument came from Cristofori himself. See Denzil Wraight, 'Recent approaches in understanding Cristofori's fortepiano', *Early Music* XXXIV/4, November 2006, 635–44, here 636–7.

33 See: Latcham, 'The twelve *clavicordios*', *op. cit.*

34 See: Carl Philipp Emanuel Bach, *Versuch über die wahre Art das Klavier zu spielen*, Berlin 1762, ii, *Von der freyen Fantasie*, § 4, 121. „Das ungedämpfte Register des Fortepiano ist das angenehmste, und, wenn man die nöthige Behutsamkeit wegen des Nachklingens anzuwenden weiß, das reizendeste zum Fantasiren." (The undamped stop of the *Fortepiano* is the most agreeable

(1694–1778), for instance, is well known for his deprecating remark in a letter written in 1774 to the Marquise Mme de Deffand that the piano was nothing but a tinker's instrument in comparison with the harpsichord.[35] No doubt Voltaire was referring to early square pianos however, rather than to such instruments as the *clavecins à piano et forte* by Johann Heinrich Silbermann already known in the 1760s in Paris.[36]

Another preference for the harpsichord is contained in the following anonymous piece published in Leipzig by Johann Adam Hiller (1728–1804) in 1769:

A harpsichord voiced in raven's quill and of good size has proved itself to be the most useful instrument for accompaniment, for small pieces and for concerts. One might however be able to reproach it with the fact that when two manuals are not available, *forte* and *piano* may only be expressed using a most unsatisfactory means, that is, by increasing or decreasing the number of voices.

The instrument that carries the name *Fortepiano* (up to now only made by Silbermann, and to which type belong innumerable instruments, some copies, some self-invented) is for most *Liebhaber* uncommonly beautiful, especially when it is used with the dampers engaged. But as pleasing as this instrument may be under certain circumstances (and if one hears it at some distance), there is perhaps no other instrument of which one tires so quickly. While we were enjoying ourselves together at a Silbermann *Fortepiano*, Mr. Daquin, a capable organist at Notre Dame in Paris, said about it: 'The harpsichord is the bread and the *Fortepiano* a tasty dish of which one soon becomes weary.' The piano is also not as good for accompanying a group of musicians as for a concerto or for solos. Besides, there have also been complaints that the touch is heavy, and, as Herr Bach remarked in his *Versuch über die wahre Art das Clavier zu spielen*, not every ornament could be performed equally well on it. It is certainly a painful situation when not everything that is part of the music can be expressed. How can this instrument be improved? One would wish that the instrument makers had more musical insight and could work with a spirit more sensitive to music; then they would keep on changing their mechanisms until they achieved the perfection in their instruments that would satisfy the connoisseur and that would be of no disadvantage to the music whatsoever.

An able organ and instrument maker, who at the same time is the organist at the Evangelical Barfüßerkirche in Augsburg, Herr Johann Andreas Stein, has been working for ten years on the improvement of the deficiencies to be found

and, if one knows how to use the necessary caution because of the reverberation, it is the most beautiful for improvising.)

35 « Cela est bien assez bon pour un piano-forte qui est un instrument de chaudronnier en comparaison du clavecin », letter of the 8th of December 1774, *Correspondance générale* in *Oeuvres complètes*, Paris 1838, vol. XIII, 466, quoted in Daniele Pistone, *Le piano dans la littérature française. Des origines jusqu'en 1900*, Paris 1975, 18.

36 See: Latcham, 'Pianos and harpsichords for Their Majesties', *op. cit.*, 366–7.

in the *Pianoforte*. He has produced an instrument that will be highly praised and admired by connoisseurs.[37]

Perhaps Louis-Claude Daquin (1694–1772), seventy-five years of age when the above was published, disliked the piano, as indeed others certainly did, but the author of the description did not entirely share this antipathy; he was happy with Stein's newest *Pianoforte*, if not so happy with those of other makers.

In the eighteenth century, certainly in the first half, it was often not a question of an exclusive or absolute preference for the harpsichord or for the piano. Rather, the choice of instrument was frequently made according to the occasion and the circumstances. The context may have demanded the harpsichord for its greater volume and incisive character or the piano for its greater dynamic sensitivity and softer sound; the harpsichord might have been preferred for continuo work at the opera while the piano was enjoyed more for chamber music; the harpsichord may have been thought to befit the formality of large reception rooms while the piano might have been considered more suited to the private music room.

37 „Ein mit Rabenkielen befiederter und gut mensurirter Flügel hat sich schon von langen Zeiten her, als das brauchbarste Instrument zum Accompagniren, zu Handstücken und Concerten bewiesen. Was man ihm etwan vorwerfen könnte, ist, daß man, wenn nicht eine doppelte Claviatur vorhanden ist, das *forte* und *piano* nicht anders als durch Vermehrung oder Verminderung der Stimmen, auf ein sehr unvollkommene Weise, auszudrücken vermag.
„Das Instrument, das den Nahmen des Fortepiano führt, so wie es bisher nur Silbermann verfertigt hat, und zu welcher Classe man eine Menge da und dort, theils nachgemachter, theils selbst erfundener Instrumente nicht zählen muß, ist für die meisten Liebhaber ungemein reizend, zumal wenn es gedämpft gebraucht wird. So angenehm aber auch dieses Instrument unter gewissen Umständen, und wenn man es in einiger Entfernung hört, seyn mag, so wird man doch auch vielleicht kein anderes sobald überdrüßig. Mr. Daquin, ein braver Organist bey Notre Dame zu Paris, sagte daher, als wir uns mit einander auf einem silbermannischen Fortepiano ein Vergnügen machten: ‚Der Flügel ist das Brodt, und das Fortepiano eine leckerhafte Speise, die man bald überdrüßig wird.' Es ist dasselbe auch nicht so gut zur Begleitung einer Musik, als zu einem Concert oder Solo zu gebrauchen. Man hat sich außerdem bisher beschwert, daß es hart zu tractiren sey, wie denn auch Herr Bach in seinem Versuche über die wahre Art das Clavier zu spielen, anmerkt, daß nicht alle Manieren gleich gut darauf heraus zu bringen wären. Gewiß ein schlimmer Umstand für die Musik, wenn sie nicht alles ausdrücken kann! Wie ist nun diesem Instrumente zu helfen? Es wäre zu wünschen, daß die Instrumentmacher mehr musikalische Einsichten hätten, und mehr mit einer für die Musik empfindbaren Seele arbeiten möchten; sie würden alsdann an ihrem Mechanismo so lang verändern, bis sie einem Instrumente die Vollkommenheit gegeben, die den Kenner auch in Kleinigkeiten befriedigte, und der Musik in keinem Stücke mehr nachtheilig wäre.
„Ein geschickter Orgel- und Instrumentmacher, der zugleich Organist an der evangelischen Barfüßerkirche zu Augspurg ist, Herr Johann Andreas Stein, hat an der Verbesserung der Mängel, die sich bey dem Pianoforte finden, seit zehn Jahren gearbeitet, und ein Instrument zu Stande gebracht, das von Kennern sehr gelobt und bewundert wird." Anon., „Nachricht von Verbesserung des Pianofortinstruments", in: *Anhang zu den wöchentlichen Nachrichten und Anmerkungen die Musik betreffend*, 24th of July, 1769, 32. The Silbermann piano was probably by Johann Heinrich.

Combining advantages

Given the coexistence of the piano and the harpsichord it is not surprising to find the advantages of both combined in single instruments. Although expression could be achieved through such generally available means as the use of rubato and articulation, the dynamic variation provided by the piano's hammers gave a player with a good touch a wealth of expressive possibilities ranging from subtle change to sudden contrast. In the eighteenth century however numerous harpsichords and pianos were provided with another means of expression: a palette of different timbres made available through the use of different stops or other devices. Sometimes these stops were explicitly intended to imitate specific stringed instruments such as the harp and the lute, effects achieved by keeping the normal dampers disengaged but partially damping the strings with leather or cloth to imitate the sound of plucked strings. In other instances, woodwind instruments such as the horn, the oboe, the clarinet and the bassoon were imitated without recourse to organ pipes but rather by manipulating the sound of the vibrating strings.[38] Sometimes the different timbres available were not specified but described in general terms, often as *Veränderungen*, literally 'changes'. The numbers of these were proudly announced: twenty, fifty and on one occasion 'more than two-hundred-and-fifty'; sometimes an instrument would simply be described as 'not unlike a complete orchestra'.[39] To make an instrument that combined the harpsichord and the piano was obviously worthwhile in this context. Not only were the advantages of both instruments combined but two very different timbres were also made available at a single instrument.

Some harpsichords were made with a means other than hammers to give the dynamic advantages of the piano. These enriched harpsichords included those with a *peau de buffle* register, invented in Paris in 1768 by Pascal Taskin the Elder (1723–1793).[40] The soft leather of the plectra was explicitly intended to enable

38 Exactly how this was done is never clear. For imitations of the flute, the recorder and the horn, see: Michael Latcham, 'Four eighteenth-century *cembali*', in: Luisa Morales (ed.), *Five Centuries of Spanish Keyboard Music*, proceedings of FIMTE conferences 2002–2004, 233–53; and of the clarinet and the bassoon, see: Michael Latcham, 'The *cembalo a martelli* of Paolo Morellati in its eighteenth-century context', *Recercare* XV, 2003, 149–67, here 157–8; and for P. J. Milchmeyer's claim that his combined harpsichord-piano could imitate many instruments including the flute, the clarinet and the bassoon just by using the strings, see: *Magazin der Musik*, I/2, ed. C. F. Cramer, Hamburg 1783, 1025. The earliest reference to an instrument with a plurality of stops and a means of changing them while playing may be the descriptions of the *clavicordio de registros* designed by Farinelli and made by Diego Fernández (1703–1775) for Queen Maria Barbara of Spain in about 1750. See: Latcham, 'The twelve *clavicordios*', *op. cit.*

39 For a longer discussion of the *Veränderungen*, see: Michael Latcham, 'Franz Jakob Spath and the *Tangentenflügel*, an eighteenth-century tradition', *The Galpin Society Journal* LVII, 2004, 150–70, here 156–8. It was Milchmeyer who claimed more than 250 *Veränderungen* for his harpsichord-piano. See: note 38.

40 For more on the widespread use of leather plectra, see: Michael Latcham, 'The combination of the harpsichord and the piano in the eighteenth century', in: Thomas Steiner (ed.), *Instruments*

the player to produce dynamic variation – and hence expression – through touch alone. According to Gilbert Trouflaut (1736–1820), writing in 1773, Taskin's soft buffalo leather plectra produced:

> ... delicious & velvety sounds; these could be increased at will by pressing more or less hard on the keyboard. By this means rich, pithy and suave tones were obtained, voluptuous to the most epicurean ear. Are passionate, tender, or dying sounds required? The *buffle* obeys the pressure of the finger; it does not pluck any more but it caresses the string. The touch, only the touch, of the harpsichordist suffices to bring about these charming variations, this without changing either keyboard or registers.[41]

Taskin's harpsichords with the *peau de buffle* stop were usually equipped with knee pommels – the *genouillères* – for changing the choice of stops while playing. These were also described by Trouflaut. One was for making a diminuendo, achieved by slowly disengaging the three stops in quill (a 4-foot stop and two 8-foot stops) in turn, leaving engaged a single 8-foot stop in *peau de buffle*.[42] By slowly releasing the same pommel, the process was reversed, giving a crescendo. Both through a varied touch using the *peau de buffle* stop, and through the use of the diminuendo knee pommel Taskin's harpsichords thus afforded the player the advantage of dynamic variation, normally considered the prerogative of the pianist.

Taskin combined the advantages of the harpsichord and the piano without using hammers. Other makers built pianos that gave the player the advantages of the harpsichord, in particular its more incisive character, not by using plectra but by means of wooden hammers with no covering. One such piano was the *Clavecin roïal* invented in Dresden in 1774 by Johann Gottlob Wagner (1741–1789).[43]

à claviers – expressivité et flexibilité, Actes des Rencontres Internationales harmoniques, Lausanne 2002, Bern, Berlin, etc., 2004, 113–52, here 115–20.

41 'De l'effet de cette peau sur la corde de l'instrument, il résulte des sons veloutés & délicieux; on enfle ces sons à volonté, en appuyant plus ou moins fort sur le clavier; par ce moyen on obtient des sons nourris, moëlleux, suaves, ou plutôt voluptueux, pour l'oreille la plus épicurienne. Désire-t-on des sons passionnés, tendres, mourans? Le buffle obéit à l'impression du doigt; il ne pince plus, mais il caresse la corde; le tact enfin, le tact seul de Claveciniste suffit pour opérer alternativement, & sans changer ni de clavier, ni de registres, ces vicissitudes charmantes.' M. [Gilbert] 'Lettre aux auteurs de ce journal, sur les clavecins en peau de buffle, inventés par Mr. Pascal. [...] le 20 Décembre 1773', *Journal de musique, par une société d'amateurs* V, 1773, 10–19, here 13.

42 See, for instance, the harpsichord 'Fait par Pascal Taskin a Paris 1782' in the Museu da Música in Lisbon, inv. nr. MM 1096. For Ruckers instruments reworked by Taskin and supplied by him with knee pommels, see for instance the 1646 Andreas Ruckers two-manual harpsichord enlarged by Taskin in 1780, Cité de la Musique, Paris, inv. no. E.979.2.1 and the harpsichord of 1764 by Jean Goermans enlarged by Taskin in 1783, now in the Russell collection, Edinburgh, cat. no. 29. The knee pommel for the diminuendo is marked with a D on the rail below the keyboard.

43 For more on Wagner and his *Clavecin roïal*, see: Michael Latcham, 'The *Clavecin roïal* of Johann Gottlob Wagner in its eighteenth-century context', in: Boje E. Hans Schmuhl and Monika Lustig (eds.), *Geschichte und Bauweise des Tafelklaviers (Michaelsteiner Konferenzberichte, Bd. 68)*, Augsburg and Michaelstein 2006, 127–84.

According to Wagner's description, his *Clavecin roïal*, in fact a large square piano, had four pedals. When the instrument was played without using any of these, the sound had:

> ... the complete strength of a harpsichord, with this difference, that the sounds in the bass continue for longer.[44]

The surviving examples of the *Clavecin roïal* (which, incidentally, are all supplied with knee levers, not pedals) have wooden hammers with no covering. These do indeed give a bright sound like that of the harpsichord. Because the dampers are normally not engaged, all the notes, especially those in the bass, go on sounding after the player has lifted his finger. Wagner's description continues:

> Just by using a stronger or weaker touch the performer is able to play with gradation, from *pianissimo*, through *piano* to *forte* [...].[45]

By pressing the second pedal and keeping it down:

> ... the instrument is then the same as a *Flügel* or *Clavecin*, just as strong in sound, and can be used to good effect with a complete music and for the accompaniment of the recitative. The tones continue sounding for as long as one leaves the hand lying and are silenced as cleanly as with a quill action. One is lord of the *piano* and *forte* just through one's touch, and of the *fortissime* by using the fourth pedal. This opens the cover over the soundboard, giving the sound freer vent: an advantage for which the *Clavecin* cannot praise itself. It remains so that on the *Clavecin* one cannot have *forte* and *piano* otherwise than by changing from one keyboard to the other.[46]

The first pedal was for a harp stop. This lowered a tasselled fringe of cloth to mingle with the strings and gave a harp-like sound when used with the dampers disengaged. The second pedal engaged the dampers, normally not engaged. The third pedal was for a moderator, the stop with which tabs of cloth or, as in this

44 „Wenn der Musikverständige das Instrument an und für sich, wie es ist, ohne einen von obigen Tritten zu berühren, bearbeitet, so hat es die völlige Stärke eines Flügels oder Clavecins, mit dem Unterschiede, daß die Töne im Baß weit länger nachhalten." Johann Gottlob Wagner, „Avertissement", *Musikalisch-Kritische Bibliothek* 1779, 323–24. According to the *Avertissement* Wagner published the invention of his *Clavecin Roïal* in 1775. The original advertisement was re-printed by Johann Nikolaus Forkel (1749–1818) in his *Musikalisch-Kritische Bibliothek* in 1779.

45 „Durchs bloße, stärkere oder schwächere, Anschlagen der Claves hat er die *Gradation* des *pianissimo, piano, forte* [...] weniger oder mehr, nach seinem Belieben, [...] in seiner Gewalt." Wagner, 'Avertissement', *op. cit.*, 324.

46 „Wenn der mittelste Tritt No. 2. angetreten wird, und der Fuß darauf stehen bleibt, so ist dieses Instrument einem Flügel oder *Clavecin* gleich, eben so starck im Klang, und kann bey einer vollständigen Musik so gut gebraucht werden, als bey dem Accompagnement der Recitative; die Töne schneiden sich ab, so rein, als durch Federkiele, und halten nach, sobald man die Hände liegen läßt; man ist Herr von dem *piano* und *forte* bloß durch den Anschlag, und von dem *fortissime*, durch Berührung des Pedaltritts No 4. welcher die Decke über den Resonanzboden öffnet, und dem Klange freyern Ausbruch verschafft: ein Vorzug, dessen sich das *Clavecin* nicht rühmen kann, und wo ich allemal, doch nur *forte* und *piano* nicht anders haben kann, als daß ich von einem Manual aufs andere gehe." *Ibid.*, 324.

case, leather, were inserted between the bare wooden hammers and the strings. According to Wagner, it was this stop, used with the dampers engaged, that gave the instrument the sound of the *Piano forte*.[47] The fourth pedal lifted a hinged cover that normally rested over the soundboard, partially closing off the sound. In the surviving instruments the cover consists of a wooden frame covered in cloth. Wagner seems to have wanted to persuade the reader (and the player) that through the use of the various stops the *Clavecin roïal* could literally be either a harpsichord (but one which allowed dynamic variation through touch) or a piano, and that furthermore, his instrument could imitate both the harp and the lute.

Another piano that was reported to have produced the sound of the harpsichord, probably again using wooden hammers with no covering, was made by Johann David Schiedmayer. Schiedmayer, or rather a text writer working on his behalf, mentioned the following:

> The one stop [removing the moderator] changes the sound in such a way that a quilled harpsichord is closely imitated, and becomes so loud that with it an orchestra of fifty voices can be accompanied. The other stop lifts the damping so that the strings reverberate longer and the sound becomes supernaturally loud.[48]

The idea that Schiedmayer's *Hammerflügel* may indeed have had bare wooden hammers is supported by a catalogue entry for one of his *Hammerflügel*, formerly in the Heyer Collection in Cologne and later in the Grassi Museum in Leipzig but sadly lost during the Second World War. The *Katalog der historischen Ausstellung der Stadt Nürnberg auf der Jubiläums-Landes-Ausstellung* (Nuremberg, 1906), the catalogue of an exhibition in which the instrument featured, included the following:

> The hammer heads originally struck with bare wood that later was covered with leather.[49]

47 „Endlich entsteht, wenn ich zu dem niedergedrückten Pedaltritt No. 3. den Tritt No. 2 zu Hilfe nehme, und beyde Füße darauf ruhen lasse, das sogenannte *Piano forte*, welches lediglich durch den schwächern und stärkern Anschlag erzeugt wird. Es sind bisher so verschiedene Arten von diesem Instrumente, in Ansehung der Größe, der Construction und der Töne, zum Vorschein kommen, daß es fast unmöglich ist, eine bestimmte, und auf alle dieselben passende Beschreibung davon zu geben." *Ibid.*, 326.

48 „Der eine Zug verändert der Ton so, daß er einem bekielten Flügel sehr ähnlich, und so stark wird, daß man ein Orchester von fünfzig Stimmen damit begleiten kann. Der andere Zug hebt die Temperatur, so daß die Saiten lange nachhallen, und der Ton ganz übernatürlich stark wird." *Magazin der Musik*, *op. cit.*, I/2, 1021–2. See: Latcham, 'The *Hammerflügel* of Johann David Schiedmayer', *op. cit.*, here 19–20.

49 „Die Hammerköpfe schlugen ursprünglich mit Blanken Holz an, das später mit Leder überzogen wurde." Quoted in: Margarete Rupprecht, *Die Klavierbauerfamilie Schiedmayer. Ein Beitrag zur Geschichte des Klavierbaues*, PhD thesis for the University of Erlangen, Nuremberg, 1954, 122–25. Rupprecht notes that the instrument was acquired for the Rück collection and went from there to the Heyer Collection in Cologne. See: Georg Kinsky, *Katalog des Musikhistorisches Museums von Wilhelm Heyer in Cöln*, 4 vols. (of which vol. 3 was never printed), Cologne, 1910–1916, 1, 177, 180 and 260 for this same *Hammerflügel* (cat. no. 174).

Another instrument built by one of Stein's journeymen providing evidence for the use of hammers with no covering was made by Johann Georg Schenk (1760–*circa* 1830). Schenk had his own workshop in Weimar in 1790.[50] A *Hammerflügel* built by him in 1798, now in the Wittumspalais in Weimar, has an action remarkably similar to those of Stein's later *Hammerflügel* except for two important features: first, the hammers have no covering; and second, originally there was a moderator.[51] No remains of any covering is discernable on the hammer heads and they have been played as they are, evidenced by lines on them made by striking the strings. This *Hammerflügel* appears to have been another instrument offering the player the bright sound of bare wooden hammers, something like the sound of the harpsichord, or the sound of the hammers striking through a moderator to give the rounder, more malleable sound associated today with the early classical piano.

Other instruments combined the advantages of the harpsichord and the piano by including jacks as well as hammers, both making use of the same strings. Reports of such instruments date from as early as 1716 with the submission of a plan to the Royal Academy in Paris for an instrument with both actions by Jean Marius (†1720), and as late as 1792 with the submission in London by James Davis (dates unknown) of a patent for a large harpsichord with jacks and hammers.[52] The earliest surviving example of such an instrument is the 1746 *cembalo a penne e a martelletti* by Giovanni Ferrini (*fl.* 1730–1755) in the Tagliavini collection in Bologna.[53] Both in Ferrini's instrument and in one attributed to Davis, the two actions can be played simultaneously from their separate keyboards but cannot be combined on either of the keyboards; only alternation and contrast are possible, not simultaneous combination on one keyboard.

In some instruments with jacks and the hammers the two actions each have their own strings but share one soundboard.[54] Johann Ludwig Hellen (1716–1781) of Bern made at least one instrument of this type. Signed *par Hellen 1763*, it survives in the Giulini collection in Briosco, sadly converted to a *Hammerflügel* with an inappropriate action.[55] Of two other instruments, both attributed to Hellen, one has also been converted to a piano in the past but is now in disarray. The

50 Gustav Schilling (ed.), *Encyclopädie der gesammten musikalischen Wissenschaften, oder Universal=Lexicon der Tonkunst*, 6 vols., Stuttgart, 1835–1838), VI, 191.

51 Roland Hentzschel kindly supplied details of the signature inside the instrument.

52 See: Latcham, 'The combination of the harpsichord and the piano', *op. cit.*, here 136–40.

53 *Ibid.*, 141. The combination instrument attributed to Davis is in the Smithsonian Institution, Washington (cat. no. 315,759), wrongly attributed to Robert Stodart and wrongly dated 1777. The similarities between the instrument and Davis's patent specification of 1792 make the attribution to Davis firm.

54 *Ibid.*, 141–6.

55 The one still with jacks and hammers is privately owned in France, the other two are in the Giulini collection, cat. no. 9, and, in disarray, the Germanisches Nationalmuseum, inv. no. MINe 105. See: Michael Latcham, 'The musical instruments *en forme de clavecin* by, or attributed to, Johann Ludwig Hellen', in *Musique, Images, Instruments* VI, 2004, 68–94.

other still has both its hammers and jacks, each with their own strings. In all three of these instruments, the separate strings for the harpsichord jacks were or are longer than those for the piano hammers. Although the strings all shared or share the same soundboard bridge, the harpsichord strings had or have a separate nut, closer towards the player on the wrestplank. In these instruments the two actions could or can be combined on the single keyboard.

The most exciting instruments that combine the advantages of the harpsichord and the piano comprise a complete harpsichord with a complete piano, each with its own soundboard, strings and action. A number of such instruments – or reports of them – exist. These include four by Stein: his *Poly-Tono-Clavichordium*, an instrument of which he may have made only one example, now lost but described at length in 1769; the *Vis-à-vis* of 1777; the *Vis-à-vis* of 1783 and another *Vis-à-vis* known only from a brief report of 1783.[56] Another *Vis-à-vis*, made by Senft (mentioned above as a journeyman at Stein's), was noted in a short report of 1793. This instrument has not survived, but the details of the report show that it was inspired by Stein's work.[57]

Before turning to the details of the four harpsichord-pianos by Stein, of the one by Senft and of other instruments by Stein, some aspects of the history of piano making in Germany will be reviewed to provide a wider context for Stein's work. In the process, other combination instruments that may have inspired Stein will come to light.

56 For the *Poly-Tono-Clavicordium*, see: Anon., „Von Erfindung eines Poly-Toni-Clavichordii oder musikalischen Affecten-Instruments, und von Verbesserung eines neuen Orgelwerks" under: item 13, „Gelehrte Sachen.", in: *Augsburger Intelligenz-Blatt* 40, 5th October 1769, no page numbers. It may be assumed that Stein had someone write the 1769 description of his *Poly-Tono-Clavichordium* for him. Paul von Stetten immediately springs to mind. The idea that Stein may only have made one *Poly-Tono-Clavichordium* is suggested by Von Stetten's description of Stein's two journeys to Paris: „Im Jahr 1758. reißte er nach Paris, und machte sich mit den vornehmsten Künstlern daselbst bekannt. Diese Reise gab ihm zu Ausarbeitung eines vortrefflichen Instrumentes Gelegenheit. Es ist ein ungemein verstärktes Clavecembel, dem er den Namen Poly=Toni=Clavicordium beylegte, ein Werk, welches den Beyfall aller Kenner erhielte. [...] Im Jahr 1773. reißte Herr Stein [...] abermals nach Paris, und hatte das Glück, nicht nur zu beyden [his *Melodica* and the *Poly-Toni-Clavicordium*] Liebhaber und Käufer zu finden, sondern auch sich auf lezterm, nämlich auf seiner Melodica, vor dem Könige und dem ganzen Hofstaate in dem Zimmer der damaligen Madame la Dauphine mit völligem Beyfalle hören zu lassen." Paul von Stetten the Younger, „Orgelbaukunst", *Kunst- Gewerb- und Handwerks-Geschichte der Reichstadt Augsburg*, Augsburg 1779, 161–62. For the *Melodica*, see below. For the 1783 report, see: Otto Carl Erdmann von Kospoth, *Von Berlin nach München und Venedig. Tagebuch einer musikalischen Reise von Berlin über Dresden, Bayreuth und Nürnberg nach Augsburg, München, Innsbruck und Venedig April bis Dezember 1783*, edited by Carl-Christian Graf von Kospoth with an introduction and commentary by Robert Münster, Weißenhorn 2006, 30. I am most grateful to Thomas Steiner for bringing this source to my attention.

57 Shelley Davis, 'The orchestra under Clemens Wenzeslaus: music at a late eighteenth-century court', *Journal of the American Musical Instrument Society* I, 1975, 86–112, here 103, footnote 25.

Aspects of the history of keyboard instrument making in the eighteenth century

An important German tradition of piano making began in the 1780s with the invention by Stein of his so-called German action (often referred to in German as the *Prellzungenmechanik*). In the 1790s, Anton Walter (1752–1826), working in Vienna, developed this action into the form known today as the Viennese action. The Viennese action flourished in the *Hammerflügel* of the Viennese tradition until at least 1830 and continued to be used, though less and less frequently, throughout the nineteenth century. The English tradition, often seen as the rival to the Viennese one, can be said to have been started by Americus Backers (*fl.* 1763–1778) in the early 1770s. This tradition was exemplified by the work of Robert Stodart (1748–1831) and John Broadwood (1732–1812) in the 1780s and was taken up in a modified form by Sébastien Érard (1753–1831) in Paris after the French Revolution.[58] The nineteenth-century competition between the Viennese and the French traditions at international exhibitions and on the concert platform ended with the supremacy of the French, a success in a large part due to Érard's invention of the double escapement action, officially patented in London by his nephew Pierre Érard (1795–1854) in 1822 and first presented in Paris in 1823. The history of pianos with Stein's German action (and its developed form, the Viennese action) thus has a delimited history, one with both a beginning and an end, while the history of pianos with an English action (and its developed form, Érard's double escapement action) has a history that continues today.

The lack of clear links between the Cristofori school on the one hand and the German and English schools on the other may be one of the reasons for the promulgation of two misguided ideas: first, that Cristofori's invention was soon forgotten; and second, that the invention of the piano was premature.[59] These two ill-founded notions not only ignore the coexistence of the piano and the harpsichord during much of the eighteenth century, as described above, but also underestimate the imaginative aspect of invention. Generally, invention in itself is not amenable to ideas of development and unilineal descent; in particular, the invention of a hammer action for the harpsichord occurred in different places, sometimes more or less simultaneously, sometimes at different times, but on each occasion independently. As with any invention, the idea of a hammer action was in each case partly the product of genius, something that has more to do with the immediacy of lightning than with steady evolution. There do not have to be

58 For a discussion of these early makers in England and of the beginnings of the Érard firm, see: Latcham, 'Pianos and harpsichords for Their Majesties', *op. cit.*, 360–72.

59 For a discussion of the often cited possibility of a connection between Cristofori and the English tradition through the piano made in Rome by a certain Father Wood and brought to England see: Latcham, 'Pianos and harpsichords for Their Majesties', *op. cit.*, 360–61. For an attempt at finding a connection between the Cristofori-Silbermann action and that of Stein, see: Latcham, 'Mozart and the pianos of Johann Andreas Stein', *op. cit.*, 134–6.

links between Cristofori's action and that of Backers and nor do there have to be links between the Cristofori school and the work of Stein. Some parts of Stein's work may have their roots in that of his predecessors, but others, including the invention of his German action, can best be seen as products of his genius.

The ideas that the piano was premature and that it had to wait until the last quarter of the eighteenth century to come into its own are in any case not universally applicable; so much was seen above.[60] In London and Vienna however, the piano did replace the harpsichord in a process that started in London in the 1760s and in Vienna probably in the 1770s. During this lengthy process, completed in both cities by about 1795, the two instruments coexisted uneasily, the harpsichord ever more criticised while the piano made its inexorable development.

Although it was Johann Zumpe (1726–1783), a German immigrant, who properly introduced the piano to London in the 1760s, he seems not to have invented the small square pianos for which he became so famous.[61] Michael Günther noted that Zumpe went back to his place of birth, Fürth (near Nuremberg), probably in about 1760, and on his return to London appears to have brought back knowledge of a type of *Tafelklavier* he had seen there.[62] Recalling the advent of the square piano, Charles Burney (1726–1814) wrote:

> … Zumpé, a German, who had long worked under Shudi, constructed small piano-fortes of the shape and size of the virginal, of which the tone was very sweet, and the touch, with a little use, equal to any degree of rapidity. These, from their low price, and the convenience of their form, as well as power of expression, suddenly grew into such favour, that there was scarcely a house in the kingdom where a keyed-instrument had ever had admission, but was supplied with one of Zumpé's piano-fortes, for which there was nearly as great a call in France as in England. In short, he could not make them fast enough to gratify the craving of the public.[63]

60 See: Latcham, 'Pianos and harpsichords for Their Majesties', *op. cit.*

61 See: Michael Günther, „Der frühe Tafelklavierbau im Gebiet des Mains und mittleren Rheins zwischen 1760 und 1790", in: Schmuhl and Lustig, (eds.), *Geschichte und Bauweise des Tafelklaviers*, *op. cit.*, 81–114, here 82–5.

62 He may even have brought back an example of his fellow countrymen's work. Johann David Schiedmayer described Fürth as a *Razen Nest* (a rats' nest) in Schiedmayer and Schiedmayer, *The Schiedmayer notebook*, *op. cit.*, folio 92v, probably writing in 1799.

63 Charles Burney, 'Harpsichord', in: Abraham Rees (ed.), *The Cyclopædia; or, universal directory of arts, sciences, and literature*, 39 vols., London 1819, vol. 17, no pagination. I am very grateful to Richard and Katrina Burnett for placing copies of the relevant pages at my disposal and to Rosemary Hall for researching the *Cyclopædia* on my behalf. Vol. 17 was in fact published in 1811 but the complete series of 39 volumes was given the date of publication of the year the last volume came out, 1819. The five volumes of plates were similarly given the date of publication of the year the last of them came out, 1820. Burney wrote his articles around 1805. See: Charles Burney, *Music, men, and manners in France and Italy, 1770. Being the journal written by Charles Burney, Mus.D. during a tour through those countries undertaken to collect material for 'A general history of music'*. Transcribed from the original manuscript in the British Museum, Additional Manuscript 35122 and edited with an introduction by H. Edmund Poole, London 1974, xv.

As Burney implies, in both London and Paris it was the square piano that first came into fashion, not the grand piano. Nevertheless, by about 1785, probably inspired by the expressive possibilities offered by the new square pianos, grand pianos were made in considerable numbers in London. In Paris, although square pianos were highly popular in the 1770s and 1780s, it took until after the French Revolution before grand pianos came into vogue; the Érard firm did not start a production of *pianofortes en forme de clavecin* in reasonable numbers until 1796.[64] These instruments were closely related to the grand pianos Sébastien Érard had seen in London.

In England and France more extensive attempts were made than elsewhere to provide harpsichords with ways and means of producing dynamic variation without removing the hands from the keyboard. First, the English machine stops allowed crescendos and decrescendos as well as dramatic changes in timbre by means of a pedal that operated the mechanisms necessary to change the stops in use. Although such machine stops were used by Shudi in many of his harpsichords from 1765 onwards they had already been used earlier by other makers. Second, the Venetian Swell, patented by Shudi in 1769, opened a set of wooden slats over the soundboard (by means of another pedal) to give a crescendo or sudden *forte*. Third, already mentioned above, Taskin's 1768 *peau de buffle* stop allowed dynamic playing through touch alone and his decrescendo knee pommel enabled decrescendos and crescendos while playing.[65] Although these applications appeared at about the time the square piano began to gain widespread recognition in England and France, such devices do not need to be understood as attempts to fend off the takeover of the piano. Both the invention of various means of making the harpsichord more dynamic and the recognition of the piano as an important dynamic instrument may be seen as aspects of the movement towards making more expressive keyboard instruments, this in response to the musical tastes of the time.

The idea that the piano was introduced too early certainly does not hold for eighteenth-century German-speaking lands. There is evidence to show that instruments with a hammer action were available there from the 1730s onwards, if not before.[66] Johann Friedrich Agricola (1720–1774) provided a remarkable report of one such early piano. He wrote that Gottfried Silbermann showed Johann Sebastian Bach (1685–1750) a piano he had made, an event that must have taken place in the late 1720s or early 1730s.[67] This case requires some examination. Clearly,

64 For more details of the developments in Paris, see: Latcham, 'Pianos and harpsichords for Their Majesties', *op. cit.*, 366–72.

65 For all three, see: Edwin Ripin, 'Expressive devices applied to the eighteenth-century harpsichord', *The Organ Year Book* I, 1970, 65–80, here 66–7. For Taskin's *peau de buffle* and the *genouillères*, see: Trouflaut, « Lettre aux auteurs de ce journal, sur les clavecins en peau de buffle », *op. cit.*, 1773, 10–19, here 13 and 14.

66 See: Christo Lelie, *Van piano tot forte: geschiedenis en ontwikkeling van de vroege piano*, Kampen 1995, 47–55; and: Stewart Pollens, *The early pianoforte*, Cambridge 1995, 157–75.

67 See: Jacob Adlung, *Musica Mechanica Organoedi*, 2 vols., Berlin 1768, II, 116 where Johann Lorenz Albrecht, in one of his added passages, described how Bach disapproved of some aspects

the hammer action in the instrument Silbermann showed Bach on that occasion must have been more primitive than his later action. Bach's criticism of the piano in question goaded Silbermann into attempts to improve his design. The long process of improvement (apparently taking years) must have involved changes to the action and in that process Silbermann may have produced a number of different actions before receiving Bach's approval. Nevertheless, the action Bach did like in the end appears to have been Silbermann's action as it exists in his three surviving *Hammerflügel*, that is, the action he must have copied directly from one of Cristofori's instruments or from one of Ferrini's rather than the product of years of research and development.[68] In short, Silbermann must have started with a different action in the 1720s or 1730s, tried to improve it, but gave up in the 1740s and resigned himself to copying Cristofori's action.[69] Be that as it may, it would certainly have been impossible for Gottfried Silbermann to have made the actions in his surviving *Hammerflügel* without having carefully examined an example of the action invented by Cristofori.[70] When Johann Heinrich Silbermann continued his uncle's tradition in his two surviving *Hammerflügel*, he continued the use of Cristofori's hammer action.

Besides the tradition thus established by Gottfried Silbermann, there was another strand in the development of the piano in German-speaking lands. This older and probably more widely-based tradition did not start from the idea of providing the harpsichord with a hammer action but from the idea of providing a dulcimer with a keyboard. In 1705 Pantaleon Hebenstreit (1668–1750) invented an enormous dulcimer played using hand-held hammers, as on a modern cimbalom.[71] The hammers were of plain wood on one side and of wood bound with wool on the other. The sound produced by the strings struck by these hammers was to have a considerable influence on piano makers in the eighteenth century. The wide dynamic range of Hebenstreit's instrument and the contrast between

of this early version (the weak treble and the difficult touch) but that after Silbermann had worked on the instrument for a number of years Bach finally gave his approval. According to: Johann Heinrich Zedler, *Großes vollständiges Universal-Lexicon aller Wissenschaften und Künste*, vol. 5, Halle & Leipzig 1733, col. 1804 (quoted in: Werner Müller, *Gottfried Silbermann. Persönlichkeit und Werk*, Frankfurt am Main 1982, 39), 1732 is the date of Silbermann's first *Piano Fort*. For more on Silbermann's early attempts, see: Lelie, *Van piano tot forte*, *op. cit.*, 54–59; and: Pollens, *The early pianoforte*, *op. cit.*, 169–72.

68 In the context of his pianos of the 1740s, Gottfried Silbermann does not appear to have been influenced by Johann Ulrich König's publication of a translation of Scipione Maffei's 1711 report of Cristofori's action in Mattheson's *Critica Musica* of 1725. Maffei's drawing – and hence König's – is of Cristofori's earlier action, not the action found in the surviving pianos by Cristofori and Silbermann.

69 David Sutherland suggested that Gottfried Silbermann might have copied an instrument by Ferrini, Cristofori's pupil, rather than one by Cristofori himself. See: David Sutherland, 'Silbermann, Bach, and the Florentine piano', *Early Keyboard Journal* 21, 2003, 45–63, here 57.

70 The link between Cristofori and Silbermann does not concern, for instance, the case shape or construction; Silbermann only imitated Cristofori's hammer action.

71 For more on Hebenstreit, see: Lelie, *Van piano tot forte*, *op. cit.*, 47–8.

the timbres made by the two kinds of hammer appear to have been particularly attractive. Throughout Europe, musicians, music lovers and instrument makers drew inspiration from the effects achieved by Hebenstreit and his followers with the hammered dulcimer. With such instruments, but provided with a keyboard, those more at ease sitting at a *Clavier* could, without leaping frenetically around their instruments as Hebenstreit is said to have done, produce the dramatic and dynamic effects for which Hebenstreit's performances were so famous.

Hebenstreit's instrument came to be called the *Pantalon* and the version with a keyboard was soon given the same name. The majority of the keyed *Pantalons* – that today would be called early pianos – were most likely quite small instruments in the shape of a clavichord or of a bentside spinet. The square pianos Zumpe would have seen on his return to Fürth in the 1760s could well have been made in the continuation of the tradition of the keyed *Pantalon*.[72]

Various piano makers were inspired by Hebenstreit's instrument. One of these was J. G. Wagner. The bare wooden hammers of his *Clavecin roïal* were probably derived from the bare wooden hammers of Hebenstreit's hammered dulcimer and the leather moderator was explicitly designed by Wagner to be used to imitate the same instrument, presumably when it was played with the hammers bound with wool. The fact that the dampers of Wagner's instruments were normally not engaged may also have been inspired by the *Pantalon*. The dulcimer player must use his arms, hands or fingers to damp the strings when required.

Before he made his beautiful *Hammerflügel*, Gottfried Silbermann also made keyed *Pantalons*, in the first place to order for Hebenstreit. In 1727 Silbermann appears to have sold one of them directly to a client. Angered by this breach of contract, Hebenstreit obtained a royal writ preventing Silbermann from continuing to make *Pantalons*.[73] Perhaps those early pianos by Silbermann were the ones he finally stopped trying to improve when he adopted Cristofori's hammer action.

Another keyboard instrument maker who was probably influenced by Hebenstreit's performances was Wahl Friedrich Fickert (*fl.* 1718–1750) of Zeitz near Leipzig.[74] In 1731 he was cited in the *Leipziger Post-Zeitungen* as the inventor of a '*Cymbal-Clavir*', literally meaning a keyed dulcimer. The description of Fickert's instrument makes clear that it had the shape of a large harpsichord and that the hammers struck downwards onto the four sets of strings. The hammers were probably of wood with no covering; there was in any case a stop, presumably a moderator, that was said to imitate the dulcimer played with cloth-bound hammers. There was also another stop that could be used to damp the vibrations of

72 Schubart, in his *Ideen zu einer Ästhetik der Tonkunst*, written in 1784/5, called such small instruments *Pantalons* and, unusually, distinguished them from the larger square pianos, those he called *Fortepianos*. He despised the *Pantalon*, describing it as a dwarf of a piano. Schubart, *Ideen zu einer Ästhetik der Tonkunst*, *op. cit.*, 289–90.

73 See: Lelie, *Van piano tot forte*, *op. cit.*, 55.

74 In some sources his name is spelled Ficker.

the strings when required. The 1731 report concludes with the remark that the whole had the 'quality of the very famous instrument called the *Pandalon*.'[75]

An instrument, perhaps also by Fickert, that combined a plucking action and a hammer action was advertised in Leipzig in 1742:

> A new *Clavecin* has been made with three keyboards of which the two lower ones command four choirs with various *Veränderungen*. But the third keyboard presents a *Cymbal* with commanding hammers and various *Veränderungen*.[76]

The two lower keyboards must have been for a harpsichord action with four rows of jacks, perhaps plucking a set of 16-foot strings, two sets of 8-foot strings and a set of 4-foot strings, or a set of 16-foot strings and three sets of 8-foot strings. The third keyboard operated a *Cymbal*, presumably a *Pantalon*, but in any case a keyboard for playing hammers. The various ways in which all the available stops could be used and combined with each other would have given the player an ample variety of timbres.

In 1758 Jakob Adlung (1699–1762) mentioned Fickert in the following passage:

> *Hämmerwerke*, or *Hämmerpantalone* are in the shape of the main body of the *Claveßin* and if they are vertical, they are like the *Clavicytherium*. But there are hammers of wood or of horn (fixed to metal or wooden shanks) that strike the strings either from underneath (up through the soundboard) or from above. Those that are to be found here are of the latter arrangement. Most of those to be seen here were made by Fickert in Zeiz [...].[77]

75 „Denen Liebhabern der edlen Musique dienet zur Nachricht, daß von dem Orgel- und Instrument-Macher, Nahmens Wahl Friedrich Fickern in Zeitz, abermahl ein neues musicalisches Instrument inventariert und verfertiget worden, welches Cymbal-Clavir genennet wird; es ist in Form eines 16-füßigen Clavicymbels, und 4 Chörig, mit 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. Überdieß hat es auch einige Veränderung: 1) eine angenehme Dämpffung, als ob mit betuchten Hämmergen gespielet würde; 2) kan man auch, vermittelst eines Zuges, das Untereinandersausen in währenden 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 erfundenen 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", *Cembalo und Hammerflügel. 10. Tage alter Musik in Herne*, catalogue, Herne 1985, 59. The dulcimer player also uses his hammers to strike downwards onto the strings.

76 „Es ist ein neues Clavecin mit 3. Clavieren verfertiget 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 Post-Zeitungen*, 22 December, 1742, 220, quoted in Ahrens, „Zur Geschichte", *op. cit.*, 59.

77 „Hämmerwerke, oder Hämmerpantalone sind in der Gestalt des Hauptkörpers dem Claveßin, und wenn sie in die Höhe gehen, dem Clavicytherio ähnlich; allein der Anschlag geschiehet durch Hämmer von Holz oder Horn, welche an metallenen oder hölzernen Stielen befestiget entweder von unten herauf durch die Decke, oder von oben herab die Saiten zum Klange bringen, und die sich hier befinden, sind alle nach der letztern Einrichtung. Die mehresten, welche hier

Franz Jakob Spath, the second and last of Stein's masters, may already have contributed to the keyed dulcimer tradition by the 1750s with a *Clavier*, perhaps meaning a clavichord-shaped instrument. Adlung wrote:

> In 1751, Franz Jacob Spath, an instrument maker in Regensburg, presented to the Elector of Bonn a *Clavier* with 30 *Veränderungen*. ...[These] included *forte*, *piano*, *pianissime*, an echo, harp, lute, *Pandaleon* and a proper flute.[78]

The word 'proper' (*ordentliche*) probably meant that in this case the flute was not imitated by a stop using the strings but by organ pipes. Exactly how all the other changes of timbre were achieved is not described, but the word *Pandaleon* strongly suggests that this was an instrument with hammers.

A more lengthy description of instruments by Spath is given in a 1765 Leipzig newspaper advertisement for his *Pandaleons-Clavecins*:

> Although for some years now different artists have made efforts to perfect the incomparable and delightful pleasure of the so-called *Pandaleons* (or *Forte-piano-Clavecins*), by all sorts of improvements, these inventions have all been judged to be faulty and imperfect [...]. This is because in such instruments, which have a hard and heavy touch, one cannot express each and every passage instantaneously *forte*, *piano* and *pianissimo*. Instead of being able to play gracefully, one is obliged to make the tones speak properly by hacking and scratching. This general evil has been entirely redressed by the famous artist and master organ builder Hr. Franz Jacob Spath of Regensburg. His *Pandaleons-Clavecins* have been raised to the highest degree of perfection, not only in the thorough evenness of the sound, but also in that on them one can be play as lightly and delicately as on a *Clavichord* [...].[79]

Further on in the advertisement the combination of Spath's *Forte-piano-Clavecin* and a *Flügel* is described:

zu sehen, hat Fickert in Zeiz verfertiget [...]". Jakob Adlung, *Anleitung zu der musikalischen Gelahrtheit*, Erfurt 1758, 559–60.

78 „Von Franz Jacob Spath, einem Instrumentmacher aus Regenspurg, wurde 1751 dem Kürfürsten zu Bonn ein Clavier vorgestellt mit 30 Veränderungen, welcher ihn reichlich beschenkte. Nach der Erzehlung der frankfurter Zeitung 1752. im 4ten Stück waren unter solchen Veränderungen forte, piano, pianissime, ein Echo, Harfe, Laute, Pandaleon, und ordentliche Flaute Traver befindlich." Adlung, *Anleitung*, *op. cit.*, Erfurt 1758, 576–7. In the second edition of the *Anleitung*, published posthumously, the reference is omitted and the *pianissime* is spelled *pianissimo*. See: Jakob Adlung, *Anleitung zur musikalischen Gelahrtheit*, Dresden and Leipzig 1783, 690–1.

79 „Obgleich verschiedene Künstler seit einigen Jahren sich Mühe gegeben, den unvergleichlich angenehmen Gusto der sogenannten Pandaleons, (oder Forte-piano-Clavecins) durch mancherley Inventiones in Vollkommenheit zu setzen, so werden doch alle diese Inventiones von wahren Kennern der Music und solchen Spielern, welche etwas ganz anders, als ein geräusch lieben, als mangelhaft und unvollkommen beurtheilt, da man bey demselben wegen Härte und Schwere des Tractaments nicht alle und iede Passagen im Moment forte, piano und pianissimo exprimiren kan, vielmehr an statt zierlich zu spielen, sich verbunden sieht, die Töne durch Hacken und Kratzen in gehörige Ansprache zu bringen. Diesem allgemeinen Uebel hat der berühmte Künstler und Orgel=Baumeister, Hr. Franz Jacob Spath, zu Regenspurg, also gänzlich abgeholfen, daß seine Pandaleons-Clavecins nicht allein in durchgängiger Gleichheit des Tones, sondern auch so leicht und delicat wie ein Clavichord gespielt, [...]". *Leipziger Zeitungen*, 10 September 1765, 564. The author is grateful to Christian Ahrens for the full citation.

> ... Hr. Spath is generally known for his *Clavecins*. Their many advantages, in particular their silvery and majestic sound, and their accuracy, are undeniable. 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.[80]

Spath appears to have described the same instrument in an announcement of 1770. There he mentioned that the combination of his *Clavecin d'Amour* (yet another name for an instrument with hammers) with the *Flügel* (the harpsichord) could give fifty *Veränderungen*.[81] The disposition of such a combined harpsichord-piano by Spath was described in a little more detail in an advertisement placed in the *Wienerisches Diarium* in 1779:

> An instrument with two keyboards, the upper one for the *Forto piano* and the lower one with quills consisting of four mutations by Jakob Spat, organ and instrument maker in Regensburg.[82]

The four 'mutations' may have referred to four sets of jacks, each with their own strings, as in Fickert's instrument of 1731.

Spath was famous in his day for the instruments today called *Tangentenflügel*. Before 1790 these instruments were not given that particular name and would have been classed as hammered instruments, along with other such instruments, and given a variety of names.[83] As in other instruments, including Wagner's *Clavecin roïal*, these later instruments by Spath and by his son-in-law Christoph Friedrich Schmahl (1739–1814) have hammers (the so-called tangents) with no covering. These hammers are special in that they are tall and narrow and not attached to any other part of the action; they behave like harpsichord jacks, riding freely in something akin to a box slide. The instruments by Spath and Schmahl thus not only look like other *Hammerflügel* but would also have sounded like

80 „[...] Hr. Spath, welcher bekanntermaßen seinen Clavecins, puncto des silberhaften majestätischen Klanges und der Accuratesse, ohnstreitig sehr vieles zum Voraus besitzet, hat noch zu grösserm Vergnügen gedachtes Forte-piano-Clavecin mit dem bekielten Flügel vermittelst zweyer Manualien zu vergnügter Abwechslung in schönster Einrichtung verbunden." *Ibid.*

81 „Jedoch aber das musikalische Vergnügen vermittelst mehrerer Abwechslung einen noch höhern Grad der Vollkommenheit zu bringen, verfertiget Endes bemerkter dergleichen Clavecins d'Amour auch mit zwey über einander liegenden Manualen (oder Clavieren), wo nehmlich bey dem untern der beliebte Flügel, bey dem obern aber das sogenannte Clavecin d'Amour, nebst einer ganz natürlichen Flauto traversiere auf das schönste angebracht sind. Kenner und welche ihr Vergnügen darinnen suchen, sich auf dergleichen Instrumenten ganz allein zu divertiren, finden bey dieser Invention ihre vollkommene Satisfaction um so mehr, als sie dabey 50 der schönsten Veränderungen vor sich haben." *Musikalische Nachrichten und Anmerkungen*, 30th April 1770, 142.

82 „... ein Instrument mit doppelten Manual, das obere Forto piano und das untere mit Federn aus 4 Mutationen bestehend, von Jakob Spat, Orgel- und Instrumentmacher in Regensburg." *Wienerisches Diarium*, 10th November 1779, cited in: Richard Maunder, *Keyboard instruments in eighteenth-century Vienna*, Oxford 1998, 149.

83 See: Latcham, 'Franz Jakob Spath and the *Tangentenflügel*', *op. cit.*, here 163.

many of them, those that had wooden hammers with no covering. Furthermore, like other keyboard instruments of the day, the surviving *Tangentenflügel* (in fact *Hammerflügel*) by Spath and Schmahl are provided with various stops that can be combined to produce the different *Veränderungen*. These stops include the moderator to soften the sound, an *una corda* that shifts the action so that the hammers each strike only one string, a harp stop that raises a fringe of silk to mingle with the strings next to the nut, and the sustaining device, the means of disengaging all the dampers.

The description of the number of *Veränderungen* in the instrument Spath presented to the Elector of Bonn in 1751, Spath's claim for fifty *Veränderungen* in 1770 and the variety of stops found on existing instruments by Spath and Schmahl together suggest a continuity in the making of instruments with a variety of stops, a tradition in which Spath had already been engaged in 1751 and that was continued by him throughout his remaining career and, after his death, by his son-in-law Schmahl until at least 1802.[84] This in turn suggests that the *Hammerflügel* Spath built in the 1760s and 1770s would also have had a variety of stops for making a number of *Veränderungen*. Similarly, the possibility of imitating the *Pantalon* on Spath's instrument of 1751 together with the presence of the bare wooden hammers in the later instruments suggest that the instruments built by Spath in the 1760s and 1770s would also have had wooden hammers with no covering. Mozart wrote in 1777 that prior to seeing the pianos of Stein, Spath's had been his favourites. Those favourite *Claviere* by Spath may well have had bare wooden hammers and a number of timbre stops.

Some action parts of the surviving instruments by Spath and Schmahl show that their instruments not only continued the *Pantalon* tradition but also may have been influenced by the tradition started by Cristofori, perhaps through Gottfried Silbermann's *Hammerflügel*. First, in the surviving instruments by Spath and Schmahl the key levers do not act directly on the hammers but operate through intermediate levers, hinged at the back of the action; somewhat similar intermediate levers are found in Cristofori's action. Second, the individual dampers in the instruments of Cristofori, of Gottfried and Johann Heinrich Silbermann, and of Spath and Schmahl are all similar to each other; they all take the form of thin jacks that rise up and down between the two strings they damp.[85] Third, although the *una corda* device Cristofori employed in two of his surviving pianos was probably intended to facilitate tuning, its musical advantage was probably

84 A so-called *Tangentenflügel* by Schmahl dated 1802 is to be found in the Sibelius Museum, Turku, Finland, inv. no. 100.

85 The details of the construction of the dampers vary from instrument to instrument and from maker to maker. Furthermore, the treble damper jacks in the instruments of Spath and of Schmahl rise next to the pair of strings they damp and each one has a block of wood, glued on the side of the jack with leather on the underside of the block.

soon discovered; the surviving instruments by Spath and Schmahl have an *una corda* operated by a knee lever. [86]

The surviving instruments by Spath and by Schmahl today called *Tangentenflügel* have the bare hammers and the optional moderator, characteristics that place them in the keyed dulcimer tradition. Other characteristics, the intermediate lever, the style of the individual dampers and the *una corda*, suggest that Spath also drew on the tradition founded by Cristofori and continued by the Silbermanns. The variety of different stops available on instruments by Spath shows too that he worked in the tradition that delighted in a variety of different timbres. These three sources of inspiration, the *Pantalon* tradition, the Cristofori tradition and the tradition of making many-coloured instruments, all appear to have played significant parts in the development of Spath's work.

Summary

In an atmosphere in which gradual dynamic variation became an essential aspect of expressive playing, an important advantage of the piano – whether it was called the hammered harpsichord, the *Pantalon*, the *Cymbal-Clavier*, the *Clavecin d'amour*, the *Forte Piano*, the *pianoforte* or (later) the *Tangentenflügel* – over most harpsichords was that it allowed the player to vary the volume through touch. Nevertheless, some harpsichords were also equipped with means of varying the volume; the *peau de buffle* plectra invented by Taskin allowed the player dynamic variation using touch alone. In various instruments knee levers or pedals enabled the player gradually to reduce or augment the number of stops in use, thus giving diminuendos and crescendos while playing. Further means of changing the dynamics of both the harpsichord and of the piano included closing and opening shutters or flaps above the soundboard using pedals or knee levers.

Another important ingredient of expressive playing consisted in having numerous timbres available in a single instrument. These normally took the form of a variety of stops and were to be found in both harpsichords and pianos. Such stops were engaged and disengaged by hand at suitable breaks in the music or by using knee levers or pedals while playing. Sometimes a harpsichord included a stop intended to make a sound that rivalled, if not bettered, the expressive sound of the piano; in a number of pianos there was a stop for imitating the harpsichord in both its incisive character and its volume.

86 The two *cembali a martelletti* by Cristofori with an *una corda* are those of 1722 (Rome) and 1726 (Leipzig). See Pollens, *The early pianoforte*, *op. cit.*, 73. The fact that Ferrini's *una corda* device operates for the jack action in his harpsichord-piano while Cristofori's operates for the hammer action adds weight to the idea that the *una corda* was intended for tuning purposes rather than as a facility for the player. If Cristofori's *una corda* had been intended for the player Ferrini would would have been more likely to copy it for the hammers, not for the jacks. To the tuner, and evidently for Ferrini, it made no difference whether the *una corda* worked for the hammers or for the jacks.

Taking into account the different advantages of the *cembalo a penne* and the *cembalo a martelletti* in the eighteenth century, taking into account too the delight in a variety of different timbres and focussing particularly on the German-speaking area, the production of instruments that combined a harpsichord with a piano is hardly surprising. Some instruments combined a harpsichord action with a piano action and a few instruments combined a complete harpsichord with a complete piano. To a greater or lesser degree, many of these instruments combined the advantages of the harpsichord and of the piano as well as both means of expression: dynamic variation and a palette of different sound colours.

Apparently inspired by Hebenstreit's performances on his hammered dulcimer, strands of a German piano-making tradition had already begun to form by about 1730 if not earlier. In that tradition, the sound was often primarily made through the use of wooden hammers with no covering, as on the dulcimer. In such early pianos, often called by the name *Pantalon*, the sound could not only be varied in colour and volume through the use of different stops and devices but also in volume through touch. Gottfried Silbermann, whose influence was certainly felt by Stein, took part in this tradition in the 1720s. Spath, one of Stein's masters, took part in the same tradition, perhaps from about 1750 onwards. By 1765 Spath had also combined a hammer action with a plucking action in a single instrument.

Cristofori's invention of a hammer action for the harpsichord inspired a different tradition, not only continued by his pupil Giovanni Ferrini in Florence and by various makers on the Iberian peninsula but also in Germany. There, Cristofori's piano action was taken up by Gottfried Silbermann, probably in the 1740s, and continued by his nephew Johann Heinrich Silbermann. In Cristofori's pianos, the cylindrical hammers were each surmounted by a pad of leather. The *una corda* stops he included in two of his instruments were probably meant to help tuning and not intended as expressive devices. Accepting this, it can be said that there were no means of changing the timbre and no sustaining device in Cristofori's pianos. In other words, Cristofori's pianos relied only on touch for expression.

The following survey of a number of Stein's instruments demonstrates in detail how he synthesised these various traditions in the making of his own instruments and how he used his genius to incorporate them in new inventions in his search for the expressive *Clavier*. The changes in Stein's thinking seem to be mirrored in the changes from one instrument to the next.

1769 – the announcement of Stein's *Poly-Tono-Clavichordium*

In 1769 Stein's *Poly-Tono-Clavichordium*, literally 'the stringed keyboard instrument of many sounds' was announced in the *Augsburger Intelligenz-Blatt* by an anonymous writer, probably instructed by Stein. This complex instrument, no example of which has survived, was a combination of a harpsichord and a piano in a case with the normal shape of a harpsichord except that it must have been

rather deep. Furthermore, there were two lids: one for the two-manual harpsichord above, opening upwards towards the ceiling; the other for the piano underneath, opening downwards towards the floor. The soundboard and strings of the piano were positioned underneath the instrument, facing the floor, mirroring the positions of the soundboard and strings of the harpsichord above. The baseboard was thus sandwiched between the normal harpsichord above and the inverted piano below. The piano was played from a third keyboard below the two for the harpsichord. The piano and the harpsichord could also be coupled on the third keyboard. The description runs as follows:

> We turn to the newly-invented *Poly-Tono-Clavichordium*, already completed. As said before, it is an ingenious combination of keyboards including the popular *Forto-Piano-Flügel* with which harmonies that can be both gentle and tumultuous, soft and melancholy, joyful and languishing are produced. Symphonies, concertos and solos can be so gracefully played with *forte* and *piano* that it seems not unlike a complete ensemble of several instruments. The separate instrument, included here, that carries the name *Fortepiano* was hitherto solely made by Silbermann in Dresden. Bartolomeus Cristofoli, *Clavier*-maker from Padua, is supposed to have first invented this instrument but Herr Christoph Gottlieb Schröter, organist in Nordhausen, claims to be the first inventor.[a)] Because this instrument was troublesome to play and because not all ornaments could be equally well performed on it, Herr Stein spent ten years adapting and experimenting with the action to improve it and to remedy the deficiencies. He changed the blunt tone by adding a sharp stop to give it more clarity and to some extent he made the combination of the *Flügel* with the *Fortepiano* more effective. He then included some additional keyboards in order to realize everything he had imagined. From all this emerged the *Forte-Piano-Instrument*, or *Poly-Clavichordium*, capable of the most perfect musical expression.
>
> The combination consists in nothing more than the possibility of coupling both instruments on one keyboard, even though each has its own case and strings. Accordingly, this work is not like those in which the hammers and the jacks share the same strings and produce unpleasant music. This is because the blow of the hammer requires quite other string lengths [*Mensur*] and other strings than the jacks. There are thus two instruments together in one, separated from each other by a baseboard in the middle. The upper instrument is a normal four-choired instrument in which three choirs are in 8-foot unison but the fourth produces an altogether gentle 16-foot tone. To this *Flügel* belong the middle and upper keyboard of which the former commands all four registers but the latter only has one 8-foot string. The lower instrument is the so-called *Pianoforte*. From the outside it is built in such a way that it looks as if it is the stand of the *Flügel*; the strings thus face downwards. The lid that closes the same slopes down when opened such that it stands in a line at right-angles in relation to our ears, reflecting the sound waves to us as well as if the instrument were above. The piano is played from the lower or third keyboard and is so light that every hand can succeed on it with ease.
>
> The mechanism is so simple, consisting of just two small pieces, a tangent and a little hammer exceptionally light in weight. The responsiveness derives from the fact that the little hammer only has to travel a distance of 3½ Parisian inches. The slightest pressure on the keys sets the strings in motion while the heaviest touch is not too much. – In truth, a lighter and yet more durable mechanism!

The stop that makes the damping or staccato, normally operated by hand either side of the keyboard, is here brought into action by a small and unnoticeable movement of the knee. This has indeed a very great advantage in that one can play single notes, passages and ornaments with a clear staccato or articulation without taking one's hands from the keyboard. Tuning the piano is no problem because the strings extend right under the front keyboard to an easily accessible position. But whoever wants to see the structure of the lower instrument in its entirety can easily turn it over should he so wish. –

The combination of this many-coloured 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 *Poly-Tono-Clavicordium* that enables the player to create a sound now pleading and emotional, now gentle and fluent. The *Forte Piano Instrument* at the same time imparts to the *Flügel* the *Crescendo* and *Decrescendo* in the most agreeable manner such that one cannot believe otherwise than that the *Flügel* has this quality of itself. On the other hand, the *Flügel* gives the *Forte-Piano-Instrument*, if it is played not damped, a soft pleasantness, swirling from one level of the affects to another, even in distant keys, without upsetting the ear.

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 not damped *Forte-Piano-Instrument*, very many registrations can be made on this newly invented *Politono Clavichordium*. But a special art is to play a melody using the soft 16-foot sound from the *Flügel* coupled alone with the *Forte-Piano*, taking the bass on another keyboard, – something exceptionally impressive for a musical ear. – Enough! Whoever wants to be convinced must see it in all its parts and hear it played.

[a] see Musica mechanica organoedi, p.115.[87]

87 „Was nun das neue erfundene bereits fertige Poly-Tono-Clavichordium betrift, so ist solches, wie gesagt, eine künstliche Zusammensetzung von Clavieren mit Verbindung des beliebten Forto-Piano-Flügels, womit sanfte, lärmende, sachte und melancholische, freudige und schmachtende Harmonien herfürgebracht, und Symphonien und Concerten wie Solo mit forte und piano so anmuthig darauf gespielt werden können, daß es einer completen Musik mit mehrern Instrumenten nicht unähnlich zu seyn scheint. = = = Das hiermit verbundene einzelne Instrument, das den Namen des Fortepiano führet, ist bißhero nur von Silbermann in Dresden verfertigt worden, welches Bartolomeus Cristofoli, Claviermacher zu Padua, zuerst erfunden haben solle; dessen sich aber, als erster Erfinder dieses Instruments, Herr Christoph Gottlieb Schröter, Organist in Nordhausen, zugeeignet.[a] Dieses, da es hart zu tractiren, und eben nicht alle Manieren gleich gut darauf herauszubringen waren, hat gedachter Herr Stein, nach zehnjährigen Versuchen und Bearbeitnngen [sic], in seinem Mechanismo abgeändert, denen dabey befindlichen Mängeln abgeholfen, dem stumpfen Ton desselben einen scharfen Zug zugesellt, und einigermassen den dazu gehörigen Flügel mit dem Fortepiano besser verbunden, und sodann einige Claviers zu Erreichung seiner Absichten, noch zugesetzt; daraus denn dieses vollkommene musikalische Affecten und Forte-Piano-Instrument, oder Poly-Clavichordium entstanden ist.

„Diese vorhin gedachte Verbindung aber bestehet weiter in nichts, als daß beyde auf einem Claviere gekoppelt werden können; denn jedes hat seinen besondern Körper und Saiten. Es ist dieses Werk demnach nicht von der Gattung derjenigen, wo die Hämmer und Doken einerlei Saiten miteinander gemein haben und eine unannehmliche Musik hervor bringen, weil der

The part of the text concerning the necessity of having different string lengths for the hammers and the jacks shows that Stein was probably aware of the problem that arises out of a need for thicker ('other') strings for the blows of the hammers

> Anschlag der Hämmer eine ganz andere Mensur, und andere Saiten verlangt, als die Doken. Es befinden sich also zwey Instrumente in einem beysammen, und sind in der Mitte durch einen Boden von einander abgesondert. Das obere Instrument ist ein gewöhnlicher vierchörigter Flügel, wovon drey Saiten in 8 füssigen Einklange stehen, die 4te aber einen ganz gelinden 16 Fußton anspricht; das mittlere und obere Clavier sind diesem Flügel zugeeignet, wovon ersteres alle vier Doken zugleich, lezteres aber nur eine 8 füssige Saite allein nimmt. Das untere Instrument ist das sogenannte Pianoforte, und in der Bauart von aussen so eingerichtet, daß es den Fuß vom Flügel vorstellt; die Saiten sehn also unter sich. Der Dekel, welcher dieselben schließt, stellt sich, bey der Eröffnung, in eine solche abhangende flache Linie, daß er mit unserm Ohre zu rechtem Winkel steht, wodurch die ausprallenden Tonstrahlen so gut in unser Ohr geführt werden, als wenn das Instrument oben wäre. Das unterste als das 3te Clavier ist ihm zu geeignet, und so leicht zu spielen, daß eine jede Hand bequem darauf fortkommt.
> „Der Mechanismus ist so simpel, daß das ganze Werk bloß in zwey kleinen Stüken, in einem Tangenten und Hämmerlein von ausserordentlicher Leichtigkeit bestehet. Die Fertigkeit läßt sich daraus schliessen, da das Hämmerlein nur einen Raum von 3½ Pariser Zoll zu durchwandern hat. Der geringste Druk der Tasten berührt die Saiten, und der stärkste übertreibt sie nicht; = = = Fürwahr, ein leichter und doch dauerhafter Mechanismus!
> „Der Zug, welcher die Demmnung oder Staccato macht, und sonsten zu beiden Seiten des Claviers eine Beschäftigung der Hände war, wird hier durch eine kleine unvermerkte Bewegung des Knies bewürkt; welches in der That ein sehr groser Vortheil ist, wenn man einzelne Noten, Passagen und Manieren scharf abstossen oder stokiren kan, ohne die Hände vom Clavier zu bringen. Das Stimmen desselben macht keine Schwürigkeit, weil die Saiten ganz unter das vordere Clavier geführet sind, wo man ohnehin leicht zukommen kan; wer aber Lust hat, das untere Instrument nach seiner Structur völlig zu sehen, der kan nach Belieben es bequem umschlagen. = = =
> „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 completten Music mit mehreren Instrumenten nicht unähnlich gleichet: indeme durch den zusammen gesezten Mechanismum dieses Poli-Tono-Chavichordii, 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 selbsten diese Eigenschaft habe, da es doch blos 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 Stuffe der Affecten zur andern, in fremden Ton-Arten mit fort, ohne das Ohr zu beleidigen.
> „Man kan demnach hieraus leicht begreiffen, 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, anbringen lassen; besonders aber ist diejenige Art von Melodien, wo man aus dem Flügel den gelinden 16 füssigen Ton spielt, und mit dem Forte-Piano ganz allein verbindet, dem Bass aber auf einem andern Clavier nimmt, = = = ein überaus einnehmendes Wesen für ein musikalisches Gehör. = = = Genug! Wer darvon überzeugt seyn will, mus solches nach allen seinen Theilen, so, wie ich, gesehen, und zu spielen gehört haben. a) s. Musica mechanica organoedi, p. 115." Anon, „Von Erfindung eines Poly-Toni-Clavichordii", *op. cit.* The introduction also mentions the *Melodica* although without giving it that name. *3½ Pariser Zoll* is 94 mm, inexplicably far for a hammer to travel. 3½ cm would be more normal.

than for the plucking of the plectra.[88] Thicker strings are relatively weaker than thinner ones, contrary to expectation, so the thicker piano strings have to be shorter than the harpsichord strings if they are to be tuned to the same pitch and not be too close to breaking point.

The passage about different strings shows too that Stein was familiar with instruments in which the two actions did share the same strings, perhaps those of Spath, once his master. Stein's *Poly-Tono-Clavichordium* was announced in 1769, four years after Spath's announcement of his instrument combining a harpsichord with a piano. The text on Spath's instrument in the 1765 Leipzig newspaper included the words:

> Now, for even greater enjoyment, Hr. Spath 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.[89]

Perhaps Stein's 1769 announcement of his *Poly-Tono-Clavichordium* goaded Spath into making a new announcement of his combination of the *Forte-piano-Clavecin* with the quilled *Flügel* in Hiller's *Musikalische Nachrichten und Anmerkungen*, published a year later, in 1770, in Leipzig:

> ... pleasure and amazement will belong to the player who uses the appropriate touch, producing sounds that are sometimes delicate and tender, sometimes penetrating and silvery. Another advantage should also not go unnoticed: this beautiful instrument, of one manual and with 8 to 10 *Veränderungen*, must be even more pleasant than all *Clavecins* and *Pantaleons*. Not only is the touch light but it is also an instrument that requires an absolute minimum of attention to keep it in tune. It follows that the player will have much of beauty and distinction at his command. But nonetheless, to bring an even greater degree of perfection to the musical enjoyment by having more changes, the undersigned has also made the same *Clavecin d'Amour* with two manuals (or keyboards) one above the other; on the lower one is the much-loved *Flügel*, while above is the so-called *Clavecin d'Amour*, in addition to an entirely realistic *Flauto traversiere*, all disposed in the most beautiful way. The connoisseur and whoever seek their pleasure by amusing themselves with such instruments completely alone, will find in this invention their complete satisfaction, all the more in that they have at their disposal fifty of the most beautiful *Veränderungen*.[90]

88 For an account of this problem, see: Latcham, *The stringing, scaling and pitch*, *op. cit.*, I, 85–92.

89 „... Hr. Spath, [...] 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 Sept. 1765, 564.

90 „... einen geschickten Spieler durch die so verschiedene durch gehörige Trückung theils delicat und zärtlich, theils aber auch penetrant, doch silberhafft ausfallende Töne das vollkommenste Vergnügen und Bewunderung zugehet, wobey noch dieses vorzüglich zu bemerken, daß dieses aus einem Manual mit 8 bis 10 Veränderungen bestehende schöne Instrument vor allen Clavecins und Pantaleons in Betracht des so zärtlichen Tractement um so mehr angenehm seyn müsse, als dabey eine gar geringe Unterhaltung des Stimmens erforderlich, folglich der Spieler mit vielen Reize das Glänzende in seiner Gewalt hat. Jedoch aber das musikalische Vergnügen vermittelst mehrerer Abwechslung einen noch höhern Grad der Vollkommenheit zu bringen,

Spath did not mention a separate set or sets of strings for the two actions of his combination of the *Flügel* and the *Clavecin d'Amour*, so it seems likely that they shared the same strings. If there was rivalry between Spath and Stein, once master and journeyman, Stein's reference to the dreadful sound made by those instruments in which the jacks and the hammers share the same strings may well have been intended as a criticism of Spath's work.

The harpsichord of Stein's *Poly-Tono-Clavichordium*, with a 16-foot stop and three 8-foot stops available on the lower of the two harpsichord keyboards and with one of the three 8-foot stops also available on the upper keyboard, is described as a 'normal four-choired instrument' indicating that this disposition was nothing out of the ordinary. Indeed, Fickert's instrument announced in Leipzig in 1731 and the instrument announced in Leipzig in 1742, possibly also by Fickert, could both have had this disposition; both had 'four choirs' of strings. The 1777 Vienna newspaper advertisement quoted above for a combined harpsichord-piano by Spath mentioned that the harpsichord had four *Mutationen*, perhaps again meaning four choirs of strings.[91]

Stein's *Poly-Tono-Clavichordium*, announced in Augsburg in 1769, could thus have belonged to a tradition that included an anonymous combination instrument, probably by Fickert, announced in Leipzig in 1742, and three by Spath, two of them also announced in Leipzig, in 1765 and 1770, and the third advertised in Vienna in 1779. What was probably new was that Stein combined a complete piano with a complete harpsichord, each with its own soundboard and strings. Nowhere does such a combination instrument appear to have been made before.

The dampers of the piano of the *Poly-Tono-Clavichordium* were engaged using a knee lever and could be used intermittently when required for 'articulated or staccato playing'. This means that, as in Hebenstreit's *Pantalon* and as in other keyboard instruments, including Wagner's 1774 *Clavecin roïal*, the strings of the 1769 *Poly-Tono-Clavichordium* were normally not damped. The description of the knee lever for engaging the dampers, mentioned as a 'new invention', is the oldest reference to a means of operating all the dampers at once while playing.

Two ways of playing expressively, both by now familiar, emerge from the description of the musical qualities of the *Poly-Tono-Clavichordium*: the first of these comprises the possibility of making dynamic variation through touch; the second comprises a number of stops for making a variety of timbres. By combining a plucking action with a hammer action both these means to expression were

verfertiget Endes bemerkter dergleichen Clavecins d'Amour auch mit zwey über einander liegenden Manualen (oder Clavieren), wo nehmlich bey dem untern der beliebte Flügel, bey dem obern aber das sogenannte Clavecin d'Amour, nebst einer ganz natürlichen Flauto traversiere auf das schönste angebracht sind. Kenner und welche ihr Vergnügen darinnen suchen, sich auf dergleichen Instrumenten ganz allein zu divertiren, finden bey dieser Invention ihre vollkommene Satisfaction um so mehr, als sie dabey 50 der schönsten Veränderungen vor sich haben." *Musikalische Nachrichten und Anmerkungen*, 30th April 1770, 142.

91 Adlung remarked however that four-choired harpsichords can have the following two dispositions: two 8' and two 4' stops; or a 16' stop, two 8' stops and a 4' stop. See: Adlung, *Anleitung*, *op. cit.*, 1758, 554.

made available to the player. From the description, the intention was clearly to play the two actions together in order to combine the advantages of both. How far Stein's ideas are removed from today's is shown by the particular combination selected in the text for special praise: the soft 16-foot harpsichord stop and the piano were to be coupled to create a solo voice on one keyboard while the accompaniment was to be played on another.

1772 – Stein's description of his *Melodica*

No example of Stein's *Melodica* has survived, but the description Stein published in 1772 gives an idea of his fascination with the possibility of being able to play expressively at the keyboard:

> For more than fifteen years I have been occupied with the investigation of music that moves the soul. Our public concerts and often an equal number of private concerts every week have afforded me ample opportunity to do so.
> It took me little trouble to discover that the only instruments that can move the heart are those whose tone is flexible, supple and capable of being augmented and diminished; in short, such instruments as those that have the qualities Bach rightly calls the substance of performance. 'The substance of performance,' he says, 'is the loudness and softness of tones, touch, the snap, legato and staccato execution, the vibrato, arpeggiation, the holding down of tones, the retard and the accelerando.' See *die wahre Art das Clavier zu spielen*, p. 117. §. 3.
> I am completely convinced of this truth. All these qualities can be found in the highest degree in the voice. The violin, the flute, the oboe and a few other instruments are true imitators of the latter in a way that other instruments only wish to be.
> [...] The violin is the most perfect for changing the tone at will. The player can even shift his entire scale as he wishes by means of skilful fingering. Only the trombone shares this advantage with the violin. These features however, that we rightly call beautiful, require considerable skill, quick and pure hearing, and above all a sensitive heart.
> [...] Since I have therefore sufficiently proved that only those instruments of which the tone is supple, flexible etc. can affect the heart, then it must be asked why we bother with keyboard instruments? To some extent the clavichord must be excepted.
> In truth, I am very displeased with these instruments, the more so since I myself neither play nor have learned any other. I have always greatly pitied the keyboard player. He must have the most superior 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. It is so that Bach can express the affect to a certain extent even on a harpsichord, but more through the execution of the piece itself than through the special quality of the tone he produces. But then, who ever is a Bach? And how would Bach himself play if his instrument had the above advantages? This sad fate has often disturbed me much.[92]

92 „Schon mehr als 15 Jahre bin ich mit Untersuchung der Musik, welche auf die Seele wirket, beschäfftiget. Unsere öffentliche Concerte, und oft eben so viele Privatmusiken in jeder Woche, verschaffen mir hinlängliche Gelegenheit darzu.

To solve these problems, Stein wrote, he set himself specific tasks: first, to find a means of making it possible to vary the volume of the sound from the softest to the loudest without distorting the pitch; second, to find a means of allowing the pitch of a note to rise and fall when required; third, to have the notes speak promptly; fourth, to have each note continue for as long as required; fifth, to allow for *Bebung* or vibration when desired. These were the ingredients of expression. Surprisingly, Stein immediately wrote off the use of strings as out of the question, thus excluding the piano.[93] Then he considered the glass harmonica but rejected it because it was an instrument that did not speak promptly and because it was limited to a single temperament; the glass harmonica was also too sleepy and melancholic. The flute turned out to be the closest to what Stein wanted; at least, so he wrote.

„Es kostete mich nicht viele Mühe zu entdecken, daß nur diejenigen Instrumenten auf das Herz spielen können, deren Ton beweglich, biegsam, zu- und abnehmend ist, kurz, die Eigenschaften besitzen, welche Bach die Gegenstände des Vortrags mit Recht nennet. ‚Die Gegenstände des Vortrags, sagt er, sind die Stärke und Schwäche der Töne, ihr Druk, Schnellen, Ziehen, Stoßen, Beben, Brechen, Halten, Schleppen und Fortgehen.' Siehe die wahre Art das Clavier zu spielen, S. 117. §. 3.

„Ich bin von dieser Wahrheit vollkommen überzeugt. In der Singstimme stecken alle diese Eigenschaften im höchsten Grade. Die Violine, die Flöte, die Oboe, und noch einige andre sind Nachahmerinnen deselben [sic] in der That, wie es andere Instrumente zu seyn bloß wünschen.

„[…] Die Violine hat diese Eigenschaft, Töne willkührlich zu verändern, am allervollkommensten. Der Spieler kann sogar seine ganze Scala, vermöge der geschickten Applicatur, verrücken, wo er hin will. Diesen Vortheil hat nur die Posaune mit der Violine gemein. Allein, diese Umstände, die wir mit Recht Schönheiten nennen, erfodern gutes Talent, ein schnelles reines Gehör, und hauptsächlich ein eigenes empfindsames Herz.

„[…] Da ich also hinlänglich erwiesen habe, daß nur diejenigen Instrumente auf das Herz spielen können, deren Ton beweglich, biegsam etc. ist, so fragt es sich, was dann mit Clavierinstrumenten anfangen? Das Clavicordium müssen wir einigermaßen ausnehmen.

„In Wahrheit, ich bin sehr ungehalten über dies Instrument, um so mehr, weil ich selbst kein anderes spiele, noch gelernet habe. 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. Es ist wahr, daß ein vortrefflicher Bach auch auf einem Flügel den Affekt einigermaßen ausdrücken kann; aber mehr durch die Ausführung des Stückes selbst, als durch die besondre Art seiner Töne. Allein, wer ist auch allemal ein Bach? oder was würde ein Bach erst spielen, wenn sein Instrument obige Vortheile hätte? Dieses traurige Geschick hat mich oft sehr beunruhiget." 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, 106–16, here 106–9. The complete text is translated in: Edwin M. Ripin, 'Johann Andreas Stein's Melodica', *The Organ Yearbook* VIII, 1977, 56–60. Ripin's translation has only partly been followed here. The quality of the German text compared with the German in Stein's *Notebook* indicates that he had a text writer working for him.

93 „Bey den Saiten sahe ich gleich alle Hoffnung verloren." (I immediately saw all hope gone with the strings). „Beschreibung eines neuerfundenen Clavierinstrumentes, Melodica genannt", *op. cit.*, 110.

Before going on to describe more details of the *Melodica* Stein sketched his general idea:

> My intention was to make an instrument for the keyboard player through which he could express his spirit and with which he would have the same advantages as with the flute or the violin. Please understand me well. My performer has to deal here not with a whole handful of notes but with the creation of a simple melody; [...].[94]

After all, Stein continued, to play chords would reduce this *Affecteninstrument* to an organ; furthermore, to play chords would require fixed pitches; it was to be a melody instrument; this was the reason for its name, the *Melodica*. The description gives some details:

> So that the player can accompany himself however, I have given my device the shape of a small *Flügel* 3½ feet long and have made it to be put on top of another instrument, with the result that the music as a whole is much improved.
> The range consists of 3½ octaves, beginning with the lowest g of the violin, up to c4 in order to include all music for the violin as well as for the flute.
> The touch of the keyboard is like that of a clavichord. The depth of touch is no greater than the thickness of the back of a thin knife – this is what enables fluency. The tone itself is very beautiful and pithy and equal to, if not surpassing, that of a recorder. The response is instantaneous without the entry of the air being noticeable in the way it usually is with organ pipes when the notes are played rapidly.
> Not the least of the difficulties consisted in making a pipe that would sound equally well with strong and weak wind.
> As far as playing in a musical sense is concerned, every sound from the first softness to the loudest *forte* can be brought out through greater or lesser pressure of the finger and can be given a slow or rapid *Bebung* at the same time.[95]

94 „Meine Absicht war, dem Clavieristen ein Instrument zu verschaffen, wodurch er seinen Geist ausdrücken vermögend, und mit der Violine oder Flöte gleiche Vortheile hätte. Man beliebe mich wohl zu verstehen. Mein Spieler hat hier nicht mit einer Hand voll Tönen, sondern mit der Bildung einer einfachen Melodie zu thun; [...]." *Ibid.*, 111.

95 „Damit man sich aber selbsten accompagniren könne, so habe ich dem Werke die Gestalt eines kleinen Flügels von 3½ Schuh lang gegeben, und es zum Aufsetzen bey einem andern Instrumente gerichtet, wodurch die ganze Musik sehr erhoben wird.
„Der Ambitus bestehet in 3½ Octaven, von dem untersten g der Violine anfangend bis in das 4te gestrichene c"" und so wohl alle Violin- als Flötenconcerte einzuschließen.
„Das Tractament des Claviers ist wie ein Clavicordium. Der Fall ist nicht tiefer als ein schwacher Messerrücken. Hierin steckt eben der Vortheil zur Geläufigkeit. Der Ton selbst ist sehr schön und körnicht, und einer Flöte à bec volkommen gleich, wo nicht übertreffend. Der Anspruch ist augenblicklich da; ohne daß der Eintritt des Windes bemerket wird, wie gemeiniglich in der Orgelpfeifen, bey geschwind gestoßenen Noten.
„Es war dieses eben keine der geringsten Schwürigkeiten, eine Pfeife so zu machen, daß sie bey starkem und schwachem Winde gleich gut anspräche.
„Was das Tractament im musikalischen Verstande betrifft, so läßt ieder Ton von der ersten Schwäche bis auf die höchste forte, durch den minder- oder mehren Druck des Fingers treiben, auch zu gleicher Zeit langsam oder geschwinde beben." *Ibid.*, 112–3.

Stein noted that he had incorporated a knee lever in the *Melodica* to compensate for the fact that the notes would sound sharp when played at their loudest, presumably because of the greater wind pressure. He gave no explanation of how this knee lever worked or how it was configured in practice with the *Melodica* on top of the harpsichord or piano.

More importantly, by writing that the *Melodica* was like the recorder, Stein seems to have admitted by default that he fell short of his original intention of making a keyboard instrument with all the capacities of the violin or the trombone – or ultimately of the human voice. In the final conclusion, the aspect of raising and lowering the pitch is no longer mentioned at all: the *Melodica* was like a flute; it was an instrument for playing melodies and had a special quality: by pressing more or less hard on the keys the volume could be augmented and diminished; at the same time, *Bebung*, fast or slow, was available. Stein's noble striving had been to make a keyboard instrument as versatile as the human voice, able to change the pitch as well as the volume at will. If he partly failed in this, the attempt nonetheless showed his persistence in his attempt to create the most expressive of all possible keyboard instruments.

The text on the *Melodica* brings another sad fact to light: Stein, so famous for his pianos, must at times have been deeply dissatisfied with them. After all, they would always fall short of his ideal expressive instrument; in Stein's own words, to make such an instrument using strings was out of the question. There do appear to have been moments when he forgot such problems however. The exuberance of the description of the *Poly-Tono-Clavichordium* may be seen as a record of one of these moments, at least by implication, and a passage in Mozart's letter to his father written about his visit to Stein in 1777 may also be interpreted as implying Stein's appreciation of the *Hammerflügel*, if not his satisfaction with it. Mozart quoted the words with which Stein compared the *Clavier* with the organ, words that suggest that Stein appreciated his *Clavier* as an instrument capable of sweetness, expression and dynamic variation:

> I said to H. Stein that I would like to play his organ because the organ was my passion. He was most astonished at this and said: what, such a man as you, such a great *Clavierist* wants to play on an instrument where there is no *douceur*, no *Expression*, no *piano*, no *forte*, but that always goes on the same?[96]

Often in this period however, the term *Clavier* meant a clavichord, the keyboard instrument that, 'to some extent', Stein excepted when declaring his general disappointment in keyboard instruments.

96 „als ich H: stein sagte ich möchte gern auf seiner orgl spiellen, denn die orgl seye meine Paßion; so verwunderte er sich groß, und sagte: was, ein solcher Mann wie sie, ein solcher grosser Clavierist will auf einen instrument spiellen, wo kein douceur, kein Expreßion, kein piano, noch forte, statt findet, sondern immer gleich fortgehet?" Mozart, *Briefe und Aufzeichnungen*, *op. cit.*, II, 69–70.

1777 – the Verona *Vis-à-vis*

Stein's 1777 *Vis-à-vis*, now in Verona, combines a *Hammerflügel* at one end of a large rectangular case and a two-manual harpsichord at the other.[97] At the harpsichord end there is a third keyboard from which the piano at the other end can be played and on which the piano and the harpsichord can be combined (ill. 6). In the *Poly-Tono-Clavichordium* the two instruments shared the baseboard; here, the harpsichord and the piano share the bentside liner, mounted on blocks on the baseboard and invisible under the hitchpin rail that divides the two halves of the soundboard.[98] The harpsichordist and the pianist face each other, hence the name *Vis-à-vis*.

Stein was not the first to combine two self-sufficient instruments in a *Vis-à-vis*. Florence Gétreau has drawn attention to a sketch of two French *clavecinistes* shown playing at opposite ends of a double harpsichord (ill. 7). Their *coiffure* was in fashion just before 1700.

Gétreau also noted that a *Vis-à-vis* is mentioned in the 1732 *Dictionnaire des arts et des sciences*:

> A square musical instrument that has two keyboards at each end is also called a *Clavessin*.[99]

Adlung described a *Vis-à-vis* in his *Musica mechanica organoedi*, partly using a simple drawing. A free translation of his words runs as follows:

> One can also make a rectangular *Clavicymbel-Corpus* with two keyboards so that two can play together. [...] The soundboard is made in a rectangular shape but with a division along the diagonal. A double *Clavessin* is thus presented in which one person has a keyboard at one short end, the other at the other end.[100]

97 The total length of the case is 2813 mm, the width 1012 mm, both without the large moulding.

98 The soundboard length (on the bass side) of the harpsichord is 1652 mm, and of the piano is 1515 mm. The usual length for the soundboard in Stein's *Hammerflügel* is 1645 mm. An exception to this is the soundboard of the 1781 *Claviorganum*; it has a length of 1372 mm. The 1783 *Vis-à-vis* has a soundboard length of 1645 mm for the harpsichord and 1656 mm for the piano.

99 « On appelle aussi Clavessin, un Instrument de musique quarré, qui a deux claviers à chaque bout. » Article « Clavessin », *Dictionnaire des arts et des sciences*, Paris 1732, 232. See: Florence Gétreau and Denis Herlin, « Portraits de clavecins et de clavecinistes français (I) », *Musique, Images, Instruments* 2, 1996, 108–9.

100 „Man kann auch ein Clavicymbel-Corpus mit zwey Clavieren machen, damit ihrer zwey spielen können. Man macht nämlich die Länge gewöhnlicher maaßen, ohne daß man etwann 1' oder etwas weniger drüber nimmt. Aber die Breite wird durchaus überein *in forma quadrati oblongi*. Alsdann macht man auch die Decke durchaus; doch wird oben darüber ein Unterschied gemacht von einer Ecke zur andern von a nach b, etwann also: [here follows a drawing of a rectangle acbd with a and b connected by a diagonal line] So präsentirt dieß ein doppelt Clavesin, deren das eine das Clavier von a nach c hat; das andere aber von d nach b. Das übrige wird gemacht, wie bisher gesagt worden." Adlung, *Musica Mechanica Organoedi*, *op. cit.*, II, 109.

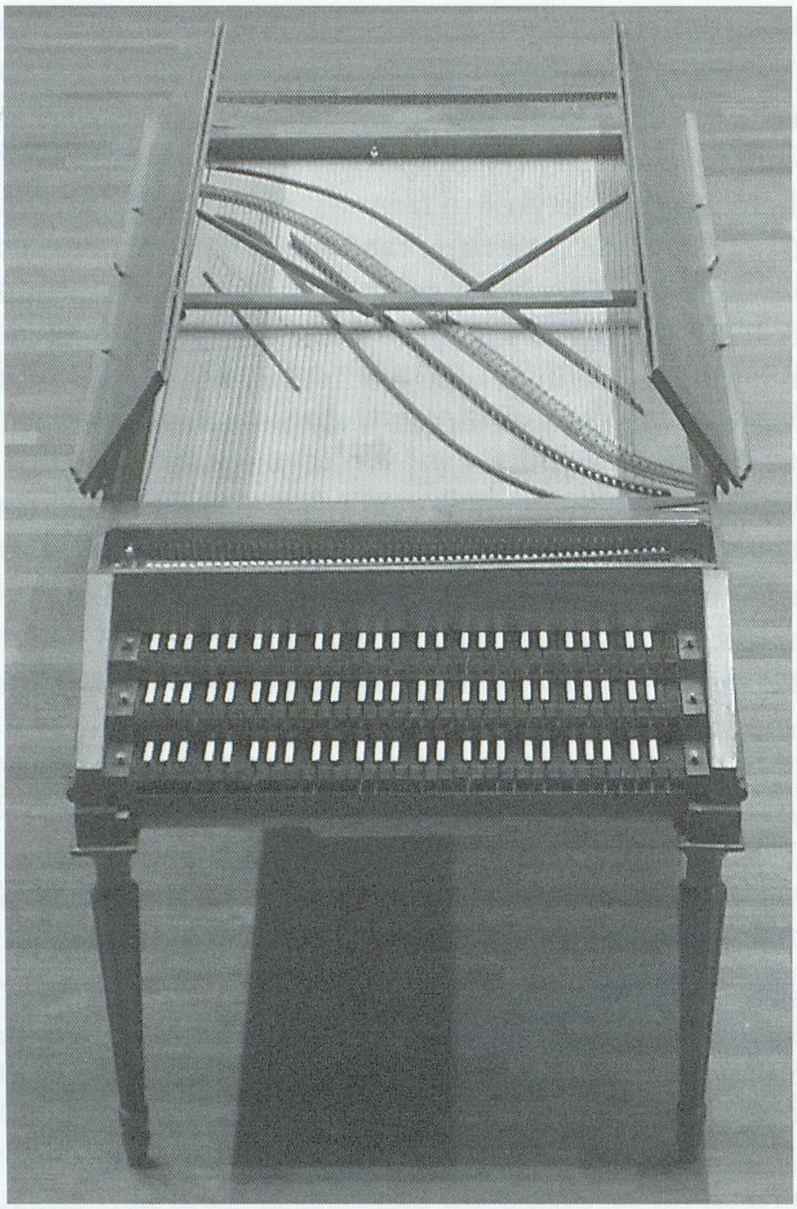

Illustration 6: The 1777 *Vis-à-vis* seen from above at the harpsichord end. The upper keyboard commands one 8-foot harpsichord stop, the middle keyboard commands all three 8-foot stops and the 16-foot stop. The lower keyboard is not only for the piano at the other end but also for combining any or all of the harpsichord stops with the piano. The long lids are folded back as music desks, raised by two lid sticks. From left to right the 4-foot bridge, the 8-foot bridge, the 16-foot bridge, the hitch-pin rail and the piano bridge are all to be seen

Although not the first to have made such instruments, Stein was reported to have invented the name *Vis-à-vis*. The relevant entry in the 1802 *Lexicon* of Heinrich Christoph Koch (1749–1816) reads:

> Double harpsichord. An instrument of the harpsichord sort with one or two keyboards at both ends so that two people can play together. There are various examples of this invention. In the year 1779 for instance, the instrument maker Hofmann in Gotha invented and built such a double harpsichord. It had two keyboards at both sides. All

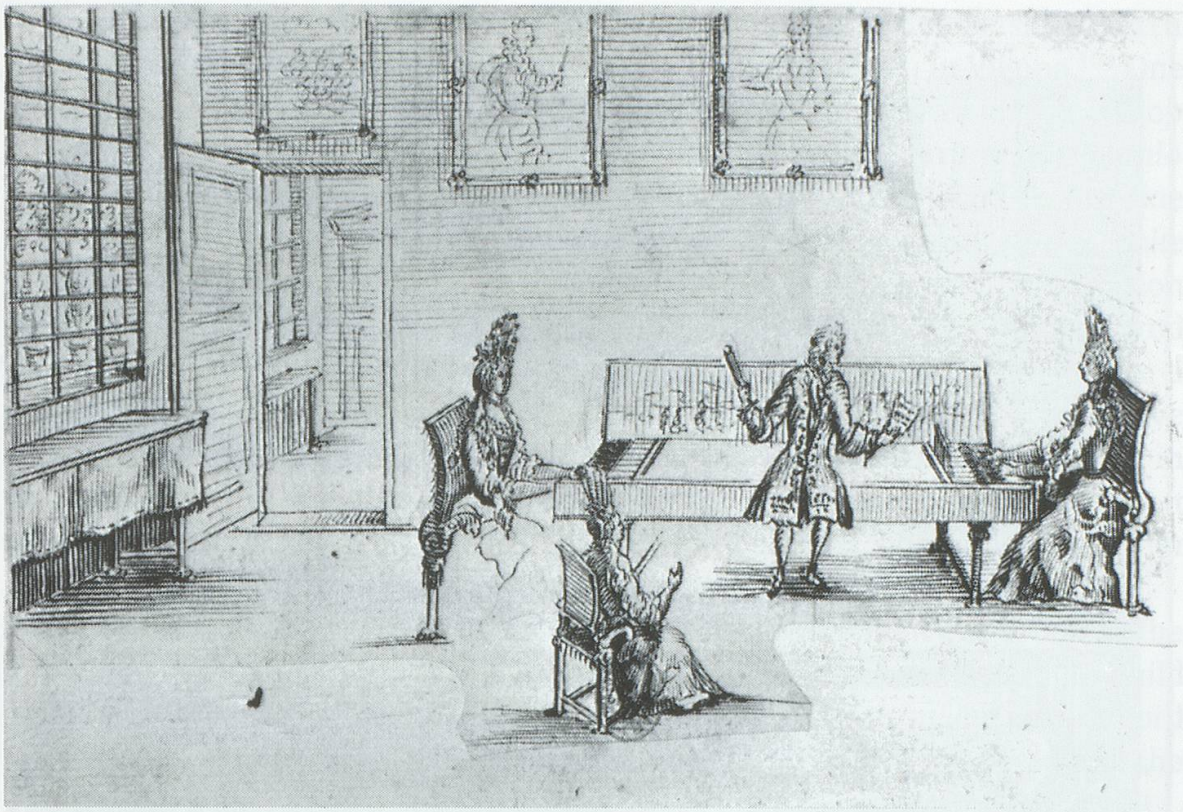

Illustration 7: A double harpsichord, vis-à-vis, of circa 1700. Ink drawing. *Bibliothèque nationale de France*, Paris

four keyboards could be coupled and played by one person. The well-known organist and *Mechanikus* Johann Andreas Stein of Augsburg also built such an instrument and gave it the name *Vis à vis*.[101]

Stein was neither the first nor the last to make *vis-à-vis* instruments. A complex *Vis-à-vis*, made by a certain Buschendorf in Leipzig in 1802, had two keyboards at each end, one for an organ and the other for a piano (ill. 8). The lid gradually lifted to give a swell for the two pianos and the doors of the chest underneath gradually opened to give a swell for the two organs. From one end a single person could play the entire instrument alone.[102]

101 „Doppelflügel. Ein Instrument nach Art der Flügel, an welchem sich an den beyden Enden ein oder zwey Claviere befinden, so daß zwey Personen zugleich spielen können. Man hat es von verschiedener Erfindung; so hat z. B. der Instrumentenmacher Hofmann in Gotha im Jahre 1779 einen solchen Doppelflügel erfunden und gebauet, der auf beyden Saiten zwey Claviere hat, und bey welchem zugleich alle vier Claviere für eine Person gekoppelt werden können. Der bekannte Organist und Mechanikus Joh. And. Stein zu Augsburg hat ebenfalls ein solches Instrument gebauet, dem er den Namen Vis à vis gegeben hat." Heinrich Christoph Koch, *Musikalisches Lexicon*, Frankfurt am Main 1802, col. 448–9.

102 The description, ending with 'Leipzig' and the name Buschendorf appeared as „Neues großes Tasten-Instrument, mit vier Hand-Klaviaturen und zwei Pedalen" in: *Journal für Fabrik, Manufaktur, Handlung und Mode* 22, Leipzig 1802, 196–210. I am grateful to Wolfgang Ruf (Switzerland) for bringing this source to my attention.

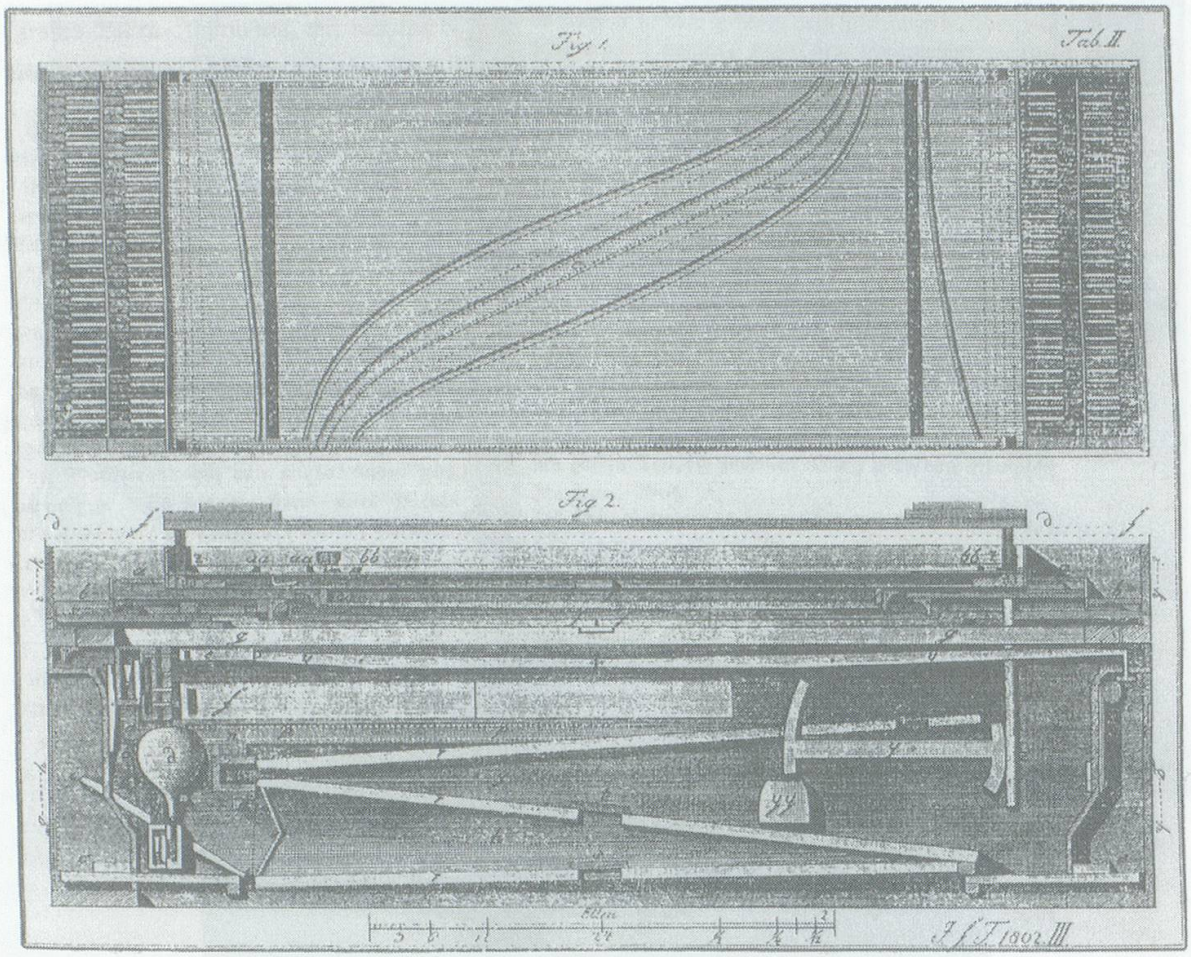

Illustration 8: An etching of a *Vis-à-vis*, made by Buschendorf of Leipzig, combining two organs and two pianos.
Journal für Fabrik, Manufaktur, Handlung und Mode 22, Leipzig 1802

Paul von Stetten the Younger (1731–1808) reported that Stein presented a *Vis-à-vis* at the court of Maria Theresa of Austria (1717–1780) in 1777:

> In 1777 he [Stein] travelled to Vienna with a newly invented large *Flügel* with two keyboards, opposite each other, and thus for two persons to play. There he made himself known at the Imperial Court with much success.[103]

This does not make clear whether the instrument concerned was a combination of two harpsichords, of a piano and a harpsichord, or of two pianos. All are possible, but as pointed out by a number of authors, if the instrument combined a harpsichord with a piano it could have been the *Vis-à-vis* now in Verona. It should be added however that the Verona instrument has a total of four keyboards, not just two.

103 „Im Jahr 1777. reißte er auch mit einem abermals neu erfundenen großen Flügel, der zwey einander gegenüberstehende Claviere hat, und also von zweyen Personen zu spielen war, nach Wien, und machte sich auch bey dem kaiserlichen Hofe unter vielem Beyfall bekannt." Von Stetten, „Orgelbaukunst", *op. cit.*, 162.

Richard Maunder noted that three other double-ended or double-sided instruments were advertised, all without the names of their makers, in Vienna.[104] One was announced in 1777 and had a two-manual harpsichord (with an 8-foot stop, a 4-foot stop and a 'lute' stop) at one end and a hammer instrument (*Pantalonisches Instrument*) at the other. The second, advertised in 1784, had 'on one side the *Forte piano*' and at the other a double-manual harpsichord with *eine doppelte Oktave* (presumably meaning a 16-foot stop but possibly meaning the extension down to FF). The third, advertised in 1786, had a *Forte piano* 'on one side' and 'on the other' a *Klavier*, the latter perhaps a harpsichord, but from the name a clavichord. This last instrument was not necessarily in *Flügel* shape. It may have combined a harpsichord-shaped instrument with a spinet-shaped instrument in the bentside, thus forming a large rectangular instrument, or alternatively it could have comprised a clavichord (*Klavier*) on one long side of a rectangular instrument and a square piano (*Forte piano*) on the other.

None of these three advertisements mentions the possibility of coupling the instruments on a single keyboard. As far as is known, Stein was the first to build a *Vis-à-vis* that not only combined a complete piano and a complete harpsichord but also allowed the harpsichordist to combine the sounds of the piano and the harpsichord together on a single keyboard.

The Verona *Vis-à-vis* in detail

The hammers of the piano action in the 1777 *Vis-à-vis* all pivot on a single brass wire in a rail, the latter held in a unit mounted on the key frame. For each note there is an escapement hopper, hinged vertically to the relevant key by means of a small leather loop at the lower end of the hopper. The loop wraps around a wire staple in the key lever (ill. 9). In each hopper (similar to, but thinner than, the hoppers in Stein's German action) there is a notch, almost at the top. Each hammer shank is divided into two lengths, one on either side of the brass wire pivot. The short length, the so-called beak, projects beyond the pivot on one side and the long length projects beyond the pivot on the other. The hammer head is glued at the far end of the long length, away from the player. The tip of the short end fits into the notch in the escapement hopper at rest. When the key is depressed, the hopper descends with it. By virtue of the notch, the hopper pulls down the beak, lifting up the longer length of the hammer shank on the other side of the pivot. The hammer head at the end of the longer length of the shank thus rises towards the strings. The configuration of the hopper notch and the beak is such that the beak escapes from the notch before the hammer reaches the plane of the strings. The hammer then continues on upwards to strike the appropriate pair of strings using the momentum already acquired. When the

104 See: Maunder, *Keyboard instruments*, *op. cit.*, 147 (1777), 154 (1784) and 157 (1785).

hammer returns and the key is allowed to return to rest, the beak fits back into the notch in the hopper. The hopper, having been pushed back by the active beak, returns to its upright position by virtue of a vertical brass spring mounted in the key (ill. 9). This action thus has an escapement mechanism. If the key itself is not counted, there are only two moving parts: one is the escapement hopper; the other is the hammer. The piano mechanism of the *Poly-Tono-Clavichordium* was described in 1769 as 'consisting of just two small pieces, a tangent and a little hammer exceptionally light in weight' and could therefore have been the same as, or similar to, the piano action of the 1777 *Vis-à-vis*.

The hammers pivot in their own rail independently of the keys in the action of the 1777 *Vis-à-vis*. In principle, this action is thus distinguished from Stein's later action (in which the hammers pivot in wooden forks, the so-called *Kapseln*, mounted on pins in the keys) but aligned with the type of action in the pianos of Cristofori and the Silbermanns (in which the hammers pivot in their own rail).[105] Furthermore, the upper part of the action of the 1777 *Vis-à-vis*, the part that includes the hammer rail, is in itself a detachable unit mounted on the lower unit of the action, the part that includes the keys and the keybed. This configuration of the action in two units is also found in the instruments of Cristofori and the Silbermanns.[106]

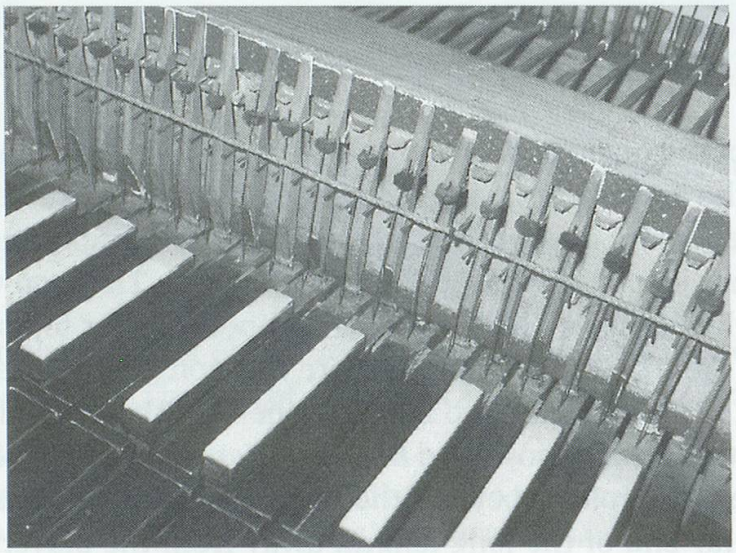

Illustration 9: The escapement hoppers in the action of the piano of the 1777 *Vis-à-vis*. Some of the hammer shanks with their hammers can also be seen beyond the pivot rail in the top right-hand corner of the photograph. Some of the beaks in their notches can be seen to the left. The felt bushings for the escapement hopper springs are not original. The springs would have fitted directly in the grooves in the hoppers. The little tongues between the hoppers hold the hammer pivot wire in place.

105 Other German makers including J. G. Wagner (in 1774) had the hammers mounted in a separate rail. See: Günther, „Der frühe Tafelklavierbau", *op. cit.*, here 82–5.

106 This configuration is also found in the English grand action in grand pianos by makers such as Stodart and Broadwood and is said to have been patented by Stodart in 1777. In fact his

In their form and in the way in which they function, the piano dampers of the 1777 *Vis-à-vis* also relate this instrument to the Cristofori-Silbermann tradition and to the instruments of Spath and Schmahl. The dampers of the piano of the 1777 *Vis-à-vis* consist of very thin jacks that are lifted by the keys, indirectly through an intermediate lever found underneath the key and protruding beyond its distal end. Each damper jack rises between the two unison strings of a single choir (ill. 10). At the top, each jack has two soft leather surfaces so glued that they form a wedge with the thin end down. When the jacks descend, the soft surfaces of this wedge stop the vibration of the strings. As already noted, the pianos of Cristofori, of both Silbermanns and of Spath and Schmahl have similar dampers.

The damper jacks each have a step cut out about halfway down the stem such that the lower half of the jack is narrower than the upper half. The steps in the jacks are all engaged by a batten (ill. 12). The batten is raised by two vertical posts, in turn raised by two intermediate levers that connect to the knee levers. When the knee levers are operated, all the dampers are thus lifted by the batten. The batten and its posts are mounted against the belly rail behind the action; the two intermediate levers are screwed to the inside case walls, one to the inside cheek, the other to the inside spine, either side of the action down close to the floor under the action. The screws securing these intermediate levers also serve as their pivots.

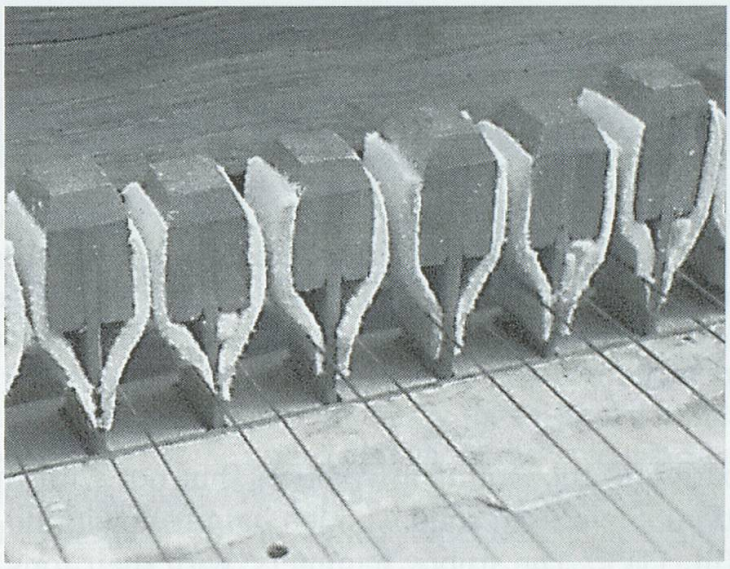

Illustration 10: Six of the dampers of the piano of the 1777 *Vis-à-vis*; the leather is modern

patent application was for a combination of a harpsichord action with a piano action. See: Latcham, 'Pianos and harpsichords for Their Majesties', *op. cit.*, here 363–4. The type of action Érard fitted in most of his grand pianos from 1796 until at least 1808 is remarkably similar to English grand action.

In Cristofori's *cembali a martelletti* there is no means of disengaging all the dampers together and in the Silbermann *Hammerflügel* there are only hand levers for this purpose, one in the treble, one in the bass. In the so-called *Tangentenflügel* of Spath and Schmahl that have survived, made between 1784 and 1802, a single knee lever disengages all the dampers at once and a hand-operated lever disengages just the treble dampers. In the 1777 *Vis-à-vis* there are two joined knee levers for disengaging all the dampers at once.[107] Stein's claim that he invented such knee levers in 1769 (albeit to engage all the dampers rather than disengage them) suggests that Spath did not use such knee levers before that date. Nonetheless, the principle of dampers, each with a wedge-shaped head at the top of a jack that rises between its respective pair of strings, appears to have been copied by Stein from instruments by Gottfried or Johann Heinrich Silbermann or from those by Spath.[108]

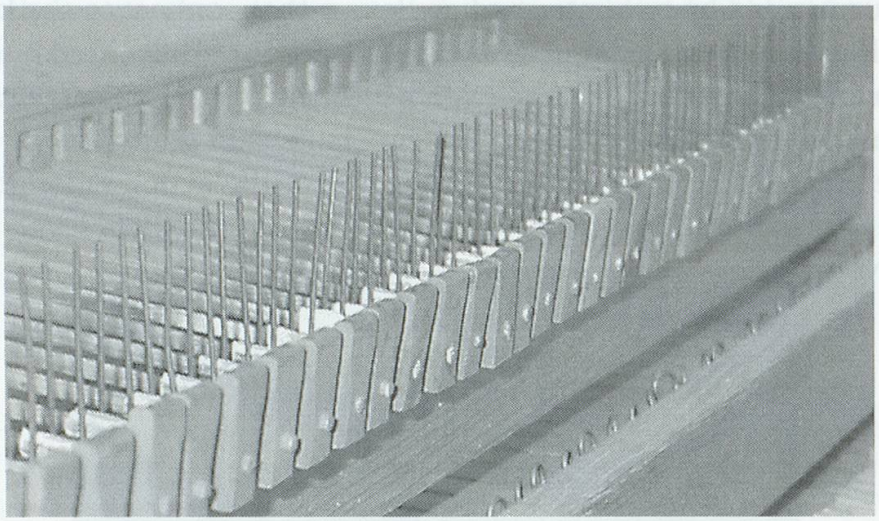

Illustration 11: The wooden hammers (with no covering of leather) in the 1777 *Vis-à-vis*. The vertical wires projecting out of the hammer rest rail act to guide the hammers as they rise. At the top and to the left the hammer rail is visible. At the bottom and to the right the pins (with a loop at the top) that secure the key levers where they are hinged at the rear (as on many organs) are just visible.

In line with Spath and the *Pantalon* tradition (but not with the Cristofori-Silbermann tradition), Stein used solid wooden hammers with no covering in the 1777 *Vis-à-vis* (ill. 11).[109] The stubby hammers, with their tops rounded where

107 The knee levers for the dampers in the *Hammerflügel* by J. H. Silbermann in private ownership in Switzerland are not original. Private communication, Christopher Clarke, March 2006.

108 The dampers from the middle of the compass to the top in Spath's instruments rise to the side of each respective choir as in Stein's instruments after 1777.

109 Wagner is exceptional in this respect. His description mentions that the *Clavecin roïal* imitated the harpsichord using the bare hammers, the *Pantalon* using the moderator and the piano using the moderator and engaging the dampers, normally disengaged.

they strike the strings, are of solid cherry, 6½ millimetres thick (front to back) at FF, 3½ millimetres wide at f3. In the bass, the hammer heads are the same in width (side to side) for their full height. In the treble the heads become narrower at the bottom where they join the shanks while remaining the same width as the bass hammers at their tops. This waisting, which increases gradually up to the last treble hammer, was presumably intended to lessen the weight of the relevant hammers.

The sound made by the wooden hammers can be modified using a moderator, engaged by hand. Evidence for the former existence of another stop is provided by small, horizontally positioned pins on the distal vertical face of the nut. These pins probably retained a batten to which a strip of tasselled cloth was attached for a harp stop or on which blocks of leather were mounted for a lute stop. The batten would have moved towards the strings, bringing the cloth or leather into contact with them to give a *pizzicato* effect. This other stop was also engaged and disengaged by hand.

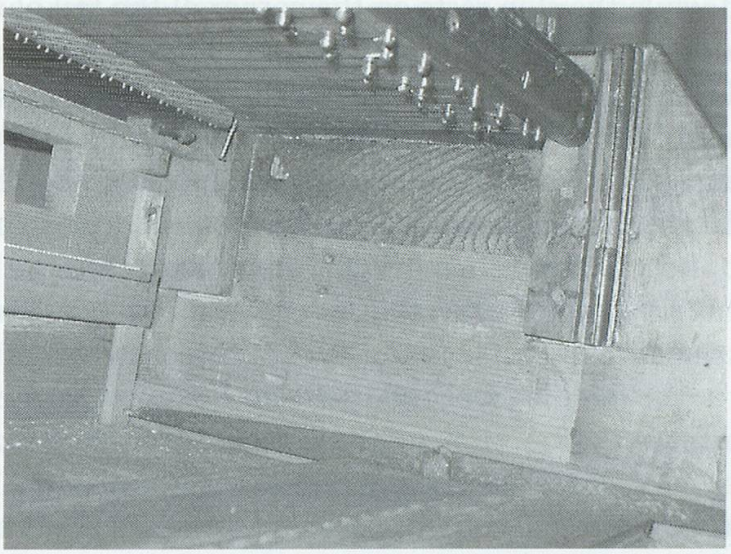

Illustration 12: The 'inverted' wrestplank of the 1777 *Vis-à-vis*.
The presumably original position intended for the harpsichord wrestplank is shown by the oak rectangle (just possibly the remains of the original wrestplank) let into the case side. The tops of a few of the tuning pins above the wrestplank can be seen at the top right. The nut and the ends of the tuning pins to which the strings are attached can be seen under the wrestplank. Much of the damper raising mechanism, including the iron linkage (and its screw) between the right knee lever and the lifting post, and the batten for lifting the dampers can be seen. The metal reinforcement on the front edge of the wrestplank is a later addition, as is the nail at the end of the nut.

A feature of the piano of the 1777 *Vis-à-vis* that does not derive from the *Pantalon* tradition but probably directly from the Silbermann tradition (and ultimately from that of Cristofori) is its so-called inverted wrestplank, to the eye astonishingly like the wrestplanks in the *Hammerflügel* of both Gottfried and Johann Heinrich

Silbermann (ill. 12). The wrestplank is mounted high in the case so that the action can pass underneath it into the instrument. The tuning pins project right through the wrestplank with the strings attached to the ends that protrude underneath the wrestplank. The strings are tuned using the square-sectioned ends of the pins that protrude above the wrestplank. This arrangement is in principle the same as that in eighteenth-century harps; their tuning pins go horizontally right through the upper, curving arm with the square tuning heads on the right-hand side (for the player) and the strings attached at the ends protruding on the left-hand side. The tuning pins of the *Vis-à-vis* are very like those in French eighteenth-century harps, the part with the square cross section at the top separated from the long section by a flange, the long section tapering from top to bottom with a slit at the bottom for attaching the strings.

The harpsichord of the 1777 *Vis-à-vis* has a 16-foot stop from C to f3 and three 8-foot stops for the full compass, FF to f3. One of the unisons can also be played from the upper keyboard by virtue of stepped ('dogleg') jacks. The lower end of each of these jacks rests on the tail of the appropriate key of the lower harpsichord keyboard while the step rests on the corner of the tail of the appropriate key of the upper keyboard.[110] One of the two sets of 8-foot strings that are played only from the lower harpsichord manual starts at FF with the strings tuned at 4-foot pitch. These octave strings have their own bridge up to G♯ (ill. 6). From A to f3 they revert to 8-foot pitch and use the 8-foot bridge. Some of the smaller *Tangentenflügel* by Spath and Schmahl also have bass 8-foot strings intended to sound at 4-foot pitch.[111] The 4-foot strings add brightness in the bass, especially welcome in the 1777 *Vis-à-vis* when the 16-foot stop is in use. The single nut has three levels for the different sets of strings, the 16-foot strings at the upper level, two 8-foot sets at the middle level and the third 8-foot set at the lower level.

The presence of the 16-foot stop may itself seem surprising today when double-manual French harpsichords or Italian harpsichords are more the fashion, but the 16-foot stop was not unusual in the German harpsichord tradition and is found for instance in the two surviving instruments by Hieronymous Hass (1685–1752) and one by his son Johann Adolf Hass (*fl.* 1740–1766).[112] Adlung described the

110 Although the jacks are modern replacements no other arrangement for the four sets of jacks seems reasonable.

111 The 1791 *Tangentenflügel* by Schmahl in the Gemeentemuseum, The Hague (inv. no. 1991-0011) still has some of its original 4-foot strings. The string lengths in the bass are so short that the 4-foot strings (for the first five notes), of iron, can use the same bridge as the 8-foot strings, the latter of brass covered with brass windings. See: Michael Latcham, 'The sound of some late eighteenth-century keyboard instruments', in: *Jaarboek, Haags Gemeentemuseum* 1993, 30–41.

112 See: Friedrich Ernst, *Der Flügel Johann Sebastian Bachs*, Frankfurt, London and New York 1955, 48–60; and: Martin-Christian Schmidt, „Der deutsche Cembalobau und das 16'-Register – Möglichkeiten und Grenzen der Realisierung", in: Christian Ahrens and Gregor Klinke (eds.), *Das deutsche Cembalo. Symposium im Rahmen der 24. Tage Alter Musik in Herne 1999*, Munich and Salzburg 2000, 53–67. The 'Bach-*Cembalo*' in Berlin and the Harraß harpsichord in Sondershausen both have a 16'. See: Sabine Hoffmann, „Das Berliner ‚Bach-Cembalo' aus der

16-foot stop as if it were nothing out of the ordinary and wrote too that an 8-foot stop could be converted into a 16-foot stop by using covered strings (instead of plain ones) and tuning them down an octave.[113] In the 1777 *Vis-à-vis* the 16-foot strings for the first five notes (C to E) use the bridge carrying the 8-foot strings and for the remaining notes (F to f3) have their own separate bridge (ill. 6). Stein probably intended covered strings for the first five notes of the 16-foot stop, but perhaps he intended them to have plain strings tuned an octave higher, that is, at 8-foot pitch, in a manner analogous to the 4-foot strings in the bass of one of the 8-foot stops. The bridge for the 16-foot strings is pierced to allow the 8-foot strings to pass through it on their way from their bridge to the hitchpin rail.

The harpsichord of the 1777 *Vis-à-vis* has a buff stop for one of the sets of 8-foot strings, the one that can be played from both the upper and the lower harpsichord keyboards. The buff stop comprises blocks of buff leather, mounted on a sliding batten, that press against the strings to give a *pizzicato* effect.[114] All the harpsichord stops except the buff stop are engaged and disengaged using hand-operated levers found on the wrestplank immediately behind the detachable nameboard. The iron stop levers pivot on screws screwed into the wrestplank. The buff stop is engaged and disengaged using a metal knob screwed directly into the sliding batten.

One of Stein's intentions for the *Vis-à-vis* was clearly that the harpsichord and the piano should be combined on one keyboard. By pushing in the lower harpsichord keyboard its keys couple with those of the third keyboard underneath.[115] In this way, all or any of the stops of the harpsichord can be coupled with the piano on the third keyboard, a feature also mentioned in the description of the *Poly-Tono-Clavichordium*. The only way to couple the 16-foot harpsichord stop alone with the piano on the lower keyboard, taking the accompaniment on a different keyboard (the registration particularly praised in the description of the *Poly-Tono-Clavichordium*) is to select only the 16-foot stop (and none of the 8-foot stops) of the harpsichord, couple the lower harpsichord manual to the third manual below, play the solo on that keyboard and take the accompaniment

Perspektive seiner Restaurierungen und Nachbauten", in: Michael Latcham (ed.), *Musique ancienne – instruments et imagination, Actes des Rencontres Internationales harmoniques, Lausanne 2004*, Bern, Berlin, etc., 2006, 151–67, here 151–4.

113 See: Adlung, *Musica mechanica organoedi, op. cit.*, 1768, 109–10 and: Adlung, *Anleitung, op. cit.*, 1758, 554. Adlung describes the most common disposition of a three-choired harpsichord as 8', 8', 4' although sometimes 16', 8', 4' occured. Four-choired harpsichords have the dispositions 8', 8', 4', 4' or 16', 8', 8', 4'; the 16' strings may be covered or not and sometimes a 16' has its own bridge.

114 The leather blocks are modern replacements for felt blocks that in turn date from the 1960s. There are only two possible sets of strings for the buff stop – the 8' which starts as a 4' and the dogleg 8'. The recent repairs (2006) chose the dogleg 8'.

115 On the undersides of the harpsichord lower manual keys there are 'dogs' which are engaged by blocks on the tops of the keys of the third keyboard. When the lower manual is pulled out again the blocks miss the dogs.

on the lower harpsichord manual. The accompaniment then has to be played an octave higher to give 8-foot pitch.[116]

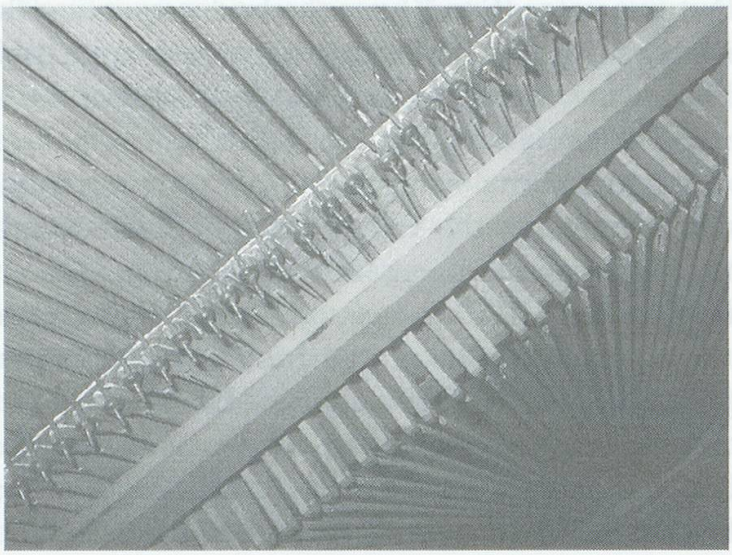

Illustration 13: Some of the squares at the harpsichord end of the 1777 *Vis-à-vis*. The undersides of the distal ends of the third keyboard are visible at the top left. The leather buttons on the rods screwed into them pull up the horizontal arms of the squares. The pivots of the squares are hidden behind the diagonal beam but the vertical arms and where they are attached to the trackers are visible below the beam. The converging trackers are also visible, disappearing into the gloom.

The third keyboard at the harpsichord end is connected to the single keyboard at the piano end by means of a square, a tracker and another square, items familiar to organ builders (ill. 13). The trackers each consist of three sections, first a thin wooden lath, then a brass wire and then another thin wooden lath. The wider surfaces of the laths are vertically orientated. Each square comprises a wooden lever in the shape of an inverted letter L. The two arms of the L are at right angles to each other and the square pivots on a pin in the corner of the L. The purpose of a square in an organ (and of those in the *Vis-à-vis*) is to transfer the motion of one part of the action to another part of the action and at the same time change the direction of the motion, usually by a right angle. In the *Vis-à-vis*, each square at the harpsichord end has a horizontal arm and a vertical arm (looked at from

116 The keyboards and jacks of the *Poly-Tono-Clavichordium* may have operated in a similar way. With normal jacks (rather than dog-leg jacks) on the upper keyboard of the harpsichord however, and an upper manual that could be pushed in to couple it to the lower harpsichord keyboard it would have been possible to play the accompaniment on the upper keyboard without transposition. The registration would then have been: upper manual (not coupled to the lower harpsichord manual) 8' on; lower harpsichord manual (coupled to the third manual) 16' on, both the lower manual 8' stops off; third manual (coupled to the lower harpsichord manual) piano and 16'.

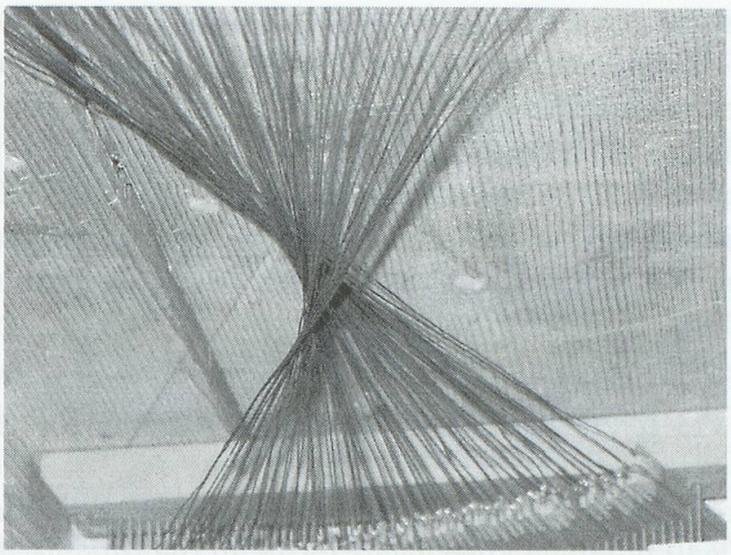

Illustration 14: The wire sections of the trackers connecting the keyboards of the piano and harpsichord of the 1777 *Vis-à-vis* in Verona shown where they cross at the centre. The sloping wooden lath can be seen with its pins for guiding the trackers. The ends of the wooden sections of the trackers can be seen where they are attached to the wire sections

the side of the whole instrument with the harpsichord on the left thus: ┐) and pivots in a rail under the distal ends of the key levers of the third keyboard (ill. 13). The horizontal arm of the square is pulled upwards by a vertical iron rod that is screwed into the underside of the key lever; the vertical arm of the square is attached to the tracker by means of a brass wire hook. Each square transforms the upward vertical motion of the distal end of the relevant key lever into the horizontal motion of the respective tracker, thus drawing the latter towards the harpsichord player. At the other end the horizontal motion of the tracker is then converted into a downward vertical motion of the respective piano key lever by the second square (thus: ┌). The latter pivots in a rail under the front of the piano keyboard. The tracker is attached to the vertical arm of the second square by a brass wire hook and the horizontal arm of the same square pulls down an iron rod attached to the piano key lever under the key plate.

The upward motion of the back of each key lever on the third keyboard at the harpsichord end is thus transformed by a square into the horizontal motion of a tracker. The horizontal motion of the tracker is then transformed by a second square into the downward motion of the front of the relevant key lever of the single keyboard at the piano end. There is nothing unusual or complex about the principles of this system to an organ maker; the trackers and squares would be as familiar to him as keyboards and pipes. Nevertheless, because, for instance, the FF keys at the two opposite ends of the instrument are diagonally positioned *vis-à-vis* each other, as indeed are all the pairs of corresponding keys (except the two in the centre of each keyboard – those for middle c) the trackers under the instrument form a large and impressive pattern that looks like a giant double fan (ill. 14). It must be because all the trackers have to cross in the centre that their

middle sections are made of brass wire. The parts of the two wooden sections of each tracker that are joined by the brass wire section each run over a sloping wooden member. A series of sixty-two vertical guides made of thick brass wire in each of the sloping members separates each individual tracker from its neighbours and ensures that they all keep their places. The two wooden members slope in opposite directions such that that the wires do not cross in the same horizontal plane at the centre.

The Verona *Vis-à-vis* and the *Poly-Tono-Clavichordium*

At the harpsichord end of the 1777 *Vis-à-vis* the player is (or rather, was) provided not only with a pair of joined knee levers (as in all the *Hammerflügel* by Stein of 1782 and later) to disengage all the dampers at the piano end but also with stop knobs for engaging and disengaging the moderator and the former harp stop (or lute stop) for the piano by hand, completing the harpsichord player's control over the workings of the piano.[117] The harpsichord end of the 1777 *Vis-à-vis* thus has the same disposition as the 1769 *Poly-Tono-Clavichordium*: in both instruments the harpsichord has three 8-foot stops and a 16-foot stop; in both instruments one of the 8-foot stops of the harpsichord can be played from the upper keyboard; in both instruments the harpsichord and the piano part can be combined on the third keyboard; in both instruments the piano dampers can be operated by knee levers by the harpsichord player.

Various features of the 1777 *Vis-à-vis* are not included in the description of the 1769 *Poly-Tono-Clavichordium*: first, the 1777 *Vis-à-vis* has a buff stop for one of the harpsichord unisons; second, all the harpsichord stops in the *Vis-à-vis* are engaged by hand; third, the lower keyboard of the *Vis-à-vis* harpsichord is pushed in to couple it to the third keyboard; fourth, from FF to G♯ one of the unisons of the *Vis-à-vis* is at octave pitch; sixth, the 16-foot of the *Vis-à-vis* stop starts at C; seventh, there is a moderator in the *Vis-à-vis*; and eighth, there was a harp or lute stop for the piano in the *Vis-à-vis*. Nothing in the description of the 1769 *Poly-Tono-Clavichordium* excludes the possibility that it also had all these eight features.

One important difference between the 1769 *Poly-Tono-Clavichordium* and the 1777 *Vis-à-vis* lies in the damping of the piano strings. While both instruments were designed with knee levers to operate all the dampers at once, it is clear that in the piano of the 1769 *Poly-Tono-Clavichordium* the piano strings were normally not damped and that the dampers were engaged when required by using the knee levers:

117 The original knee levers for the dampers at the harpsichord end are now missing and have been replaced by a single knee lever. The harp or lute stop has been replaced by a bassoon stop.

> The stop that makes the damping or staccato, normally operated by hand either side of the keyboard, is here brought into action by a small and unnoticeable movement of the knee. This has indeed a very great advantage in that one can play single notes, passages and ornaments with a clear staccato or articulation without taking one's hands from the keyboard.[118]

The phrase 'normally operated by hand either side of the keyboard' could be a reference to the *Hammerflügel* of Gottfried Silbermann; his surviving *Hammerflügel* have hand-operated stop levers either side of the keyboard for the dampers, as already noted.[119] To be able to operate all the dampers at once may thus have been a new invention in about 1746 (Gottfried Silbermann); to be able to operate all the dampers at once without taking the hands from the keyboard appears to have been a new invention in 1769 (Stein). But while in the 1769 *Poly-Tono-Clavichordium* the dampers of the piano strings were normally not engaged and could be engaged when required using a knee lever, the dampers of the piano of the 1777 *Vis-à-vis* are normally engaged and can all be disengaged when required, as on the modern piano. When Mozart wrote to his father in 1777 he made clear that the knee lever for the dampers on the piano he played at Stein's also disengaged the dampers. From the text of his letter it seems too that by 1777 (and from the tone of his words, probably earlier) Mozart expected the dampers to be normally engaged:

> The knee lever is also better made by him than by the others. I hardly have to touch it and it goes already; and as soon as one takes away the knee just a little one does not hear the slightest reverberation.[120]

In this change of principle, that is, from a piano (normally not damped) with a means of engaging the dampers when required (1769) to a piano (normally damped) with a means of disengaging the dampers when required (1777), it might be said that Stein stepped over from the *Pantalon* tradition to the Cristofori-Silbermann tradition.[121] In maintaining hammers with no covering and offering an optional moderator in the piano of the 1777 *Vis-à-vis* Stein nonetheless appears to have remained loyal to the *Pantalon* tradition.

118 „Der Zug, welcher die Demmnung oder Staccato macht, und sonsten zu beiden Seiten des Claviers eine Beschäftigung der Hände war, wird hier durch eine kleine unvermerkte Bewegung des Knies bewürkt; welches in der That ein sehr groser Vortheil ist, wenn man einzelne Noten, Passagen und Manieren scharf abstossen oder stokiren kan, ohne die Hände vom Clavier zu bringen." Anon., „Gelehrte Sachen", *op. cit.*, item 13.

119 See: Pollens, *The early pianoforte*, *op. cit.*, 181–3.

120 „die Machine wo man mit dem knie drückt, ist auch bey ihm besser gemacht, als bey den andern. ich darf es kaum anrühren, so geht es schon; und so bald man das knie nur ein wenig wegthut, so hört man nicht den mindesten nachklang." Mozart, *Briefe und Aufzeichnungen*, *op. cit.*, II, 69.

121 Spath probably made the same change at some point before 1777.

The Verona *Vis-à-vis* and Mozart's letter of 1777

The only evidence for the type of the instrument by Stein on which Mozart played and about which he expressed a preference in his letter to his father in 1777 is provided by the 1777 *Vis-à-vis*. This is important in that it suggests that the hammers of the piano Mozart played at Stein's probably also had no covering and thus produced a bright, harpsichord-like sound. Not only that, Mozart may have expected to play on instruments with such hammers at the time. More evidence for this is given by contemporary writings and by other eighteenth-century instruments with bare hammers. As already noted, such makers probably already included Spath in 1750, certainly Wagner in 1774, and Schenk, who had been a journeyman with Stein, in 1790.

Mozart may have expected to play on pianos that not only gave him the possibility of varying the volume using touch but that also included a variety of stops for changing the timbre, that is, he may have expected to play on pianos with the two means of expression normal at the time, touch and timbre stops. The *Clavecin roïal* by Wagner, the surviving instruments by Spath and Schmahl and the one *Hammerflügel* by Schenk have or had an optional moderator. Both the *Clavecin roïal* of Wagner and the surviving instruments of Spath and Schmahl also have other stops including a harp stop. In the piano of the 1777 *Vis-à-vis* there is a moderator, engaged by hand, and there was also another stop, probably a harp or a lute, as already described.

When in his letter to his father of 1777 Mozart compared Stein's instruments with Spath's, the instruments of both these makers were probably wing-shaped, both probably had wooden hammers with no covering, both responded dynamically to the touch, both probably gave the player a choice of stops for a variety of timbres and in both the dampers could probably have been disengaged using knee levers. If all this is true, the only essential difference between Stein's instruments and Spath's lay in the fact that Stein's instrument had an escapement mechanism whereas Spath's did not. This Mozart noted in his letter of 1777:

> His [Stein's] instruments have something special that others do not have: they are made with escapement. There is not one in a hundred that have this, but without escapement it is hardly possible that a *Piano forte* does not rattle or reverberate; when one plays the keys, his little hammers fall back immediately after striking the strings, whether one holds the keys down or not.[122]

As with other technical parts of Mozart's letter, it seems unlikely that this passage was based on Mozart's own observation; much more likely is that Stein gave the necessary details to Mozart so that he could relay them to his father. Stein's

122 „seine instrumente haben besonders das vor andern eigen, daß sie mit auslösung gemacht sind. da giebt sich der hunderteste nicht damit ab. aber ohne auslösung ist es halt nicht möglich daß ein Piano forte nicht schebere oder nachklinge; seine hämmerl, wenn man die Claves anspielt, fallen, in den augenblick da sie an die saiten hinauf springen, wider herab, man mag den Claves liegen lassen oder auslassen." Mozart, *Briefe und Aufzeichnungen*, *op. cit.*, II, 68.

words, if indeed they are his, amount to a criticism of Spath's instruments. Rivalry between Stein and Spath may again be present here.

To sum up: in his letter of 1777, Mozart expressed a previous preference for the instruments of Spath but a new preference for those of Stein. The evidence there is for the characteristics of the pianos of both these makers at that time suggests that they were instruments built in the tradition of the keyed *Pantalon*, that is, they had wooden hammers with no covering and an optional moderator. The instruments of both Spath and Stein offered the player the expressive possibilities of varying the volume through touch and changing the timbre through the use of stops. Both probably had two joined knee levers for disengaging the dampers when required. Probably neither the superior damping of Stein's pianos nor their escapement mechanism was the reason why Mozart preferred Stein's instruments to Spath's; it seems more likely that the praise of these aspects of Stein's pianos came from Stein himself, impressed on Mozart so that he could pass it on to his father. Mozart may simply have preferred the fuller sound he encountered in Stein's pianos. The sound of the piano played alone in the 1777 *Vis-à-vis* can certainly be louder and fuller than can the sound of some of the surviving instruments by Spath and Schmahl.

The Verona *Vis-à-vis* – innovation and change

At least one *Vis-à-vis* was made in the late seventeenth century and Marius already combined the harpsichord and the piano in 1716, so neither the idea of having two keyboard instruments combined in a single *Vis-à-vis* nor the idea of combining a harpsichord with a piano was new. To have strings of different lengths for the harpsichord and the piano was also not new; Hellen already used this principle in 1763 and the same principle was already noted in the 1769 description of the *Poly-Tono-Clavichordium*. The combination of the harpsichord and the piano in the particular disposition found in the 1777 *Vis-à-vis* was also not new to Stein; he had already used it in the 1769 *Poly-Tono-Clavichordium*. What was new in the 1777 instrument was the combination of the harpsichord and the piano *vis-à-vis* for two people but arranged in such a way that one person could play both the harpsichord and the piano alone, combining them on one keyboard and contrasting them on different keyboards. The complete instrument could not only be played by two people, as in earlier *vis-à-vis* instruments by other makers, but also by a single person, as in the *Poly-Tono-Clavichordium*. In effect, Stein combined the idea of a *vis-à-vis* instrument with his design for his *Poly-Tono-Clavichordium*. That this was new to Stein is evidenced by some features of the instrument itself and circumstantially by some pages from his notebook.

Originally, the 1777 *Vis-à-vis* was to have a two-manual harpsichord with one 16-foot sub-bass and three 8-foot unisons at one end and a single-manual harpsichord with two 8-foot unisons at the other. There was to be no connection

between the two ends. The process of building this double harpsichord must have been quite advanced when Stein had the idea of transforming it into a combined harpsichord-piano. The rectangular soundboard for the double harpsichord appears to have already been made when Stein started to put his change of plan into practice; a scar shows where the bridge for the smaller of the two harpsichords had already been glued on.[123] The bridge was repositioned to give the shorter strings required for a piano, as explained by the 1769 description of the *Poly-Tono-Clavichordium*:

> [...] the blow of the hammer requires completely different string lengths and other strings than the jacks.[124]

This (to recapitulate) must have meant that a piano should have thicker, shorter strings than a harpsichord. In the 1777 *Vis-à-vis* this is indeed the case. The string gauges marked for the 8-foot harpsichord strings on the wrestplank at the harpsichord end start with gauge 2/0 (about 0.6 millimetres) for FF and go up to gauge 9 (about 0.2 millimetres) from a1 to the top note, f3.[125] Although there are no visible gauges marked at the piano end, the evidence from Stein's notebook (that contains stringing lists for harpsichords and pianos) and from three of Stein's surviving pianos (that have retained some or all of their string gauge markings), shows that he hardly changed his stringing practice for pianos during his whole career. From this it may be inferred that for the piano of the 1777 *Vis-à-vis* Stein would have used gauge 5/0 (about 0.8 millimetres) as the thickest gauge at FF and gauge 5 (about 0.3 millimetres) as the thinnest from around d3 to f3. As far as the string lengths are concerned, the length of 297 millimetres for the longer of the two c2 strings of the piano may be compared with 336 millimetres for the longest of the three 8-foot strings of the harpsichord. The evidence thus indicates that the strings of the harpsichord of the 1777 *Vis-à-vis* were indeed longer and thinner than the strings of the piano.

That the small harpsichord of the 1777 *Vis-à-vis* was changed to a piano can also be inferred from the inverted wrestplank. The wrestplank for the small harpsichord was planned to be in the normal position. This is to be seen inside the case sides where there are still signs that must surely indicate its intended location (ill. 12). A harpsichord keyboard (including the guide rail for the keys at the back) would have been shallow enough to slide in under such a normally positioned wrestplank. For the taller piano action (including the hammer unit surmounting the keyframe), the wrestplank had to be raised higher in the case and 'inverted'. The new wrestplank is wider (front to back) than was the intended harpsichord

123 The present string length for the note c1 for the piano is 567 mm. Estimating the original string lengths using the position of the scar gives a harpsichord string length for c1 of 643 mm. The longest string for c1 at the harpsichord end of the *Vis-à-vis* is 641 mm.

124 „[...] der Anschlag der Hämmer eine ganz andere Mensur, und andere Saiten verlangt, als die Doken." Anon, „Von Erfindung eines Poly-Toni-Clavichordii", *op. cit.*

125 For a fuller discussion of the string lengths, string thicknesses and tensions of the 1777 *Vis-à-vis* and in general see: Latcham, *The stringing, scaling and pitch*, *op. cit.*, 1, 87–9.

wrestplank.[126] Accordingly, the front of the case was lengthened by about two centimetres on each side by adding to the sloping ends of the case sides.[127] That the case sides have been lengthened in this way is shown by the veneer on the outside case. The original veneer pattern with its panels and cross-banding does not cover the whole of the case sides but stops short of the additions.

The changes at the harpsichord end of the 1777 *Vis-à-vis* were also radical. The two original harpsichord keyboards had to be raised higher in the case so that the third, new keyboard could be inserted underneath them. The so-called upper belly rail, in this case a vertically orientated plank that runs across the instrument and supports the front edge of the soundboard, was hacked away by about four centimetres on its underside to allow the rear end of the raised middle keyboard to pass underneath it.[128] From the crude way in which this was done, it is clear that the upper belly rail was already glued in place.

Another change at the harpsichord end involved lengthening the case. Because the third, lowest, additional keyboard protrudes forward towards the player from beneath the two original ones, the case had to be lengthened by about twelve centimetres, the visible length of the additional keyboard. This extension of the case is again evidenced by the pattern of the veneer on the outside of both long case sides. At the bottom, acute-angled corner, the cross-banding of plain walnut veneer (that surrounds the panel of figured walnut veneer) is not mitred as it should be and surely would have been had the case been left unaltered.

During the transformation of the instrument, after both ends had been altered, the entire coupling mechanism with its trackers and squares was added underneath to make it possible to play the piano from the third keyboard at the harpsichord end. Two large covers, hinged on a batten across the middle line of the case, open downwards for servicing the squares and trackers. The deep moulding along the bottom edges of the two long sides must then have been added to the instrument to complete the false bottom.

Page 306 (twenty-three pages before a page including the date 1777) of Stein's notebook shows sketches of his new ideas for a *Vis-à-vis* (ill. 15). At the top of the page, a plan view of a *vis-à-vis* instrument can be seen. Underneath this there is a criss-cross of lines joining the lower long side of the sketch of a *Vis-à-vis* to a curious line below. This criss-cross appears at first to be an idle doodle, but anyone familiar with the double fan-like pattern formed by the trackers underneath the

126 The harpsichord wrestplank is 163 mm wide, front to back, the width of the piano wrestplank is 205 mm. The normal width for the wrestplanks in Stein's *Hammerflügel* is 185 mm.

127 The case, measured at the bottom, was not lengthened at the piano end. But by gluing a section to the sloping sections of the cheeks to extend them forwards, the case was appropriately lengthened at the height of the wrestplank.

128 The lower belly rail and the upper belly rail are usually vertically orientated case members that run across the instrument at right angles to the case sides at the back of the action. Together they form the bulkhead of the instrument. The top-most keyboard stops at the upper belly rail while the next one down, the lower keyboard of the harpsichord, goes under the upper belly rail and stops at the lower belly rail, the latter set further back in the case than the upper belly rail.

1777 *Vis-à-vis* will recognize that pattern in the drawing. A closer look shows that the curious line underneath represents one of the trackers and its two squares. To the left of the double fan-like pattern there appears to be a sketch of the profile of the deep moulding running along the two long sides of the instrument.

The page of the sketch cannot certainly be dated to the year 1777 but the presence of that date only twenty-three pages further on in the notebook, taken together with the improvisational character of the changes made to the 1777 *Vis-à-vis* suggests that the sketch in the notebook shows Stein's mind working out the inspiration to create the same instrument, the 1777 *Vis-à-vis* now in Verona.

The Verona *Vis-à-vis* – summary

The 1777 *Vis-à-vis* gives the possibility of playing expressively by using touch and by using a variety of timbres. These possibilities were not new; touch and a variety of timbres belonged to a tradition that went back to Hebenstreit's *Pantalon*. That tradition included not only Fickert's instruments of the 1730s and Spath's combination instruments of 1765 (and probably earlier) but also Stein's *Poly-Tono-Clavichordium* of 1769.

What is significant about the 1777 *Vis-à-vis* today is that it provides the only evidence there is for the type of pianos that Stein made in 1777, the year that Mozart visited him and praised his instruments. No feature of the 1777 *Vis-à-vis* piano is at variance with the description Mozart gave of Stein's pianos in his letter to his father of the 17th of October 1777.

What is surprising today is that the hammers of the piano in the 1777 *Vis-à-vis* are of plain wood with no covering and that there are (or were) stops for changing the sound those hammers made. Mozart may have been used to such hammers and stops in the pianos he preferred before and after his visit to Stein in 1777. Both the instruments of Spath (Mozart's preferred maker before 1777) and the instruments of Stein (Mozart's preferred maker after 1777) most probably had bare wooden hammers with no leather covering and both probably had at least a moderator, if not other stops for modifying the sound as well.

What is spectacular about the 1777 *Vis-à-vis* today is not only the dynamic sound of the *Hammerflügel* with its plain wooden hammers and the variety of different sound colours made available through the many different stops, but also, and more especially, the variable sound of the harpsichord action combined with the hammer action. By coupling the two instruments the sound seems to be that of a special harpsichord with the quality it had always missed, that of allowing the player dynamic expression through touch. This quality was given particular mention in the 1769 description of the *Poly-Tono-Clavichordium*:

> The *Forte Piano Instrument* at the same time imparts to the *Flügel* in the most agreeable manner the *Crescendo* and *Decrescendo* such that one cannot believe otherwise than that the *Flügel* has this quality of itself.

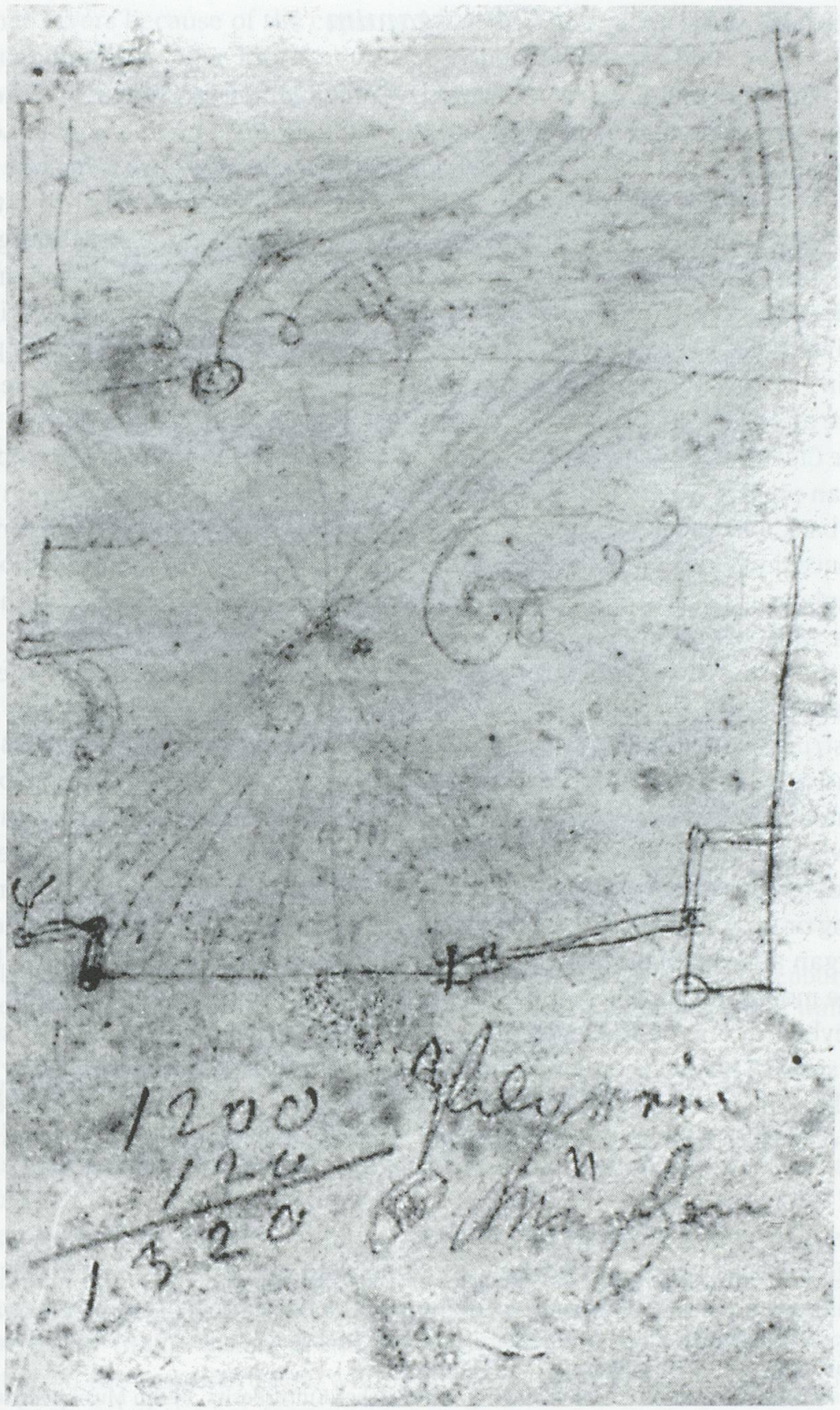

Illustration 15: The schematic drawing of a *Vis-à-vis* in Stein's notebook.
At the top, a plan view of a *Vis-à-vis* can be seen.
Below, one of the trackers with its two squares is shown. Joining the plan view and the tracker is the criss-cross pattern formed by the 61 trackers.

1781 – the Gothenburg *Claviorganum*

Prior to the work of Reinhardt Menger, the *Claviorganum* by Stein now in Gothenburg was considered to be of 1770 and the *Hammerflügel* by him now in Leipzig was thought to be of 1773.[129] Menger showed that the labels (that include these dates) on both the instruments had been falsified and that, according to ink inscriptions inside the instruments, the true dates were 1781 (Gothenburg) and 1783 (Leipzig).[130] The dates were probably changed in the late nineteenth or early twentieth century to improve the provenance of the two instruments; by bringing them into the period before 1777, when Mozart wrote his famous letter in praise of Stein's pianos, they would have acquired a particular interest to those desiring to have an instrument that could be associated with Mozart.

The *Claviorganum* of 1781 is a *Hammerflügel* with an additional flute stop, a set of organ pipes, C to f3 (ill. 16). The single rank of stopped 8-foot wooden pipes break back to open metal pipes for the top octave. They and the bellows for them are concealed in the cupboard that serves as a stand for the piano. The doors to the cupboard, situated under the bentside, consist of frames of wood with cloth panels. Most of the pipes are positioned horizontally in the cupboard.[131]

Of the two keyboards, the lower one is for the flute while the upper one is for the piano, FF to f3. The lower keyboard is pushed in under the upper one when the instrument is closed. The last seven keys of the organ keyboard, FF to BB, have no musical function. The bellows are pumped using a pedal. The two keyboards are automatically coupled when the lower one is drawn out for use such that the only way not to play the organ from either keyboard is not to pump the bellows. Parts of the instrument, including some to do with the pedal, appear either to be missing or to have been altered however, so the present possibilities for selecting the organ and the piano may be more limited than they once might have been.

The moderator for the piano is engaged by two 'draw stops', one on the left of the keyboard, one on the right. The dampers are disengaged using two similar draw stops. This is exceptional; all the other surviving *Hammerflügel* by Stein, including the piano of the 1777 *Vis-à-vis*, have knee levers for this purpose. The hand-operated draw stops were probably unavoidable however; there is no space

129 Reinhardt Menger provided the true dates, private communication, 1990. The falsification of dates and provenances may have been of particular satisfaction to the Dutch dealer and collector Paul de Wit. Through his hands passed the Leipzig instrument as well as the infamous 'Bach-Cembalo', now in Berlin.

130 Staatliches Institut für Musikforschung, Preußischer Kulturbesitz, Berlin Musikinstrumenten-Museum, inv. no. 5013. The *Hammerflügel* with a Stein label including the date 1775 (in the collection in Berlin) is clearly the work of Johann Lodewijk Dulcken (1761–1836) and should be dated about 1790. This instrument also passed through De Wit's hands.

131 When doubled (because it is a stopped pipe), the speaking length of the pipe for c2 has more or less (the stop in the pipe can be moved out or in) the same length as the sounding length of the longest piano string for c2 (306 mm).

for knee levers because of the cupboard for the pipes under piano. To pump the organ and operate knee levers at the same time would also have been difficult.

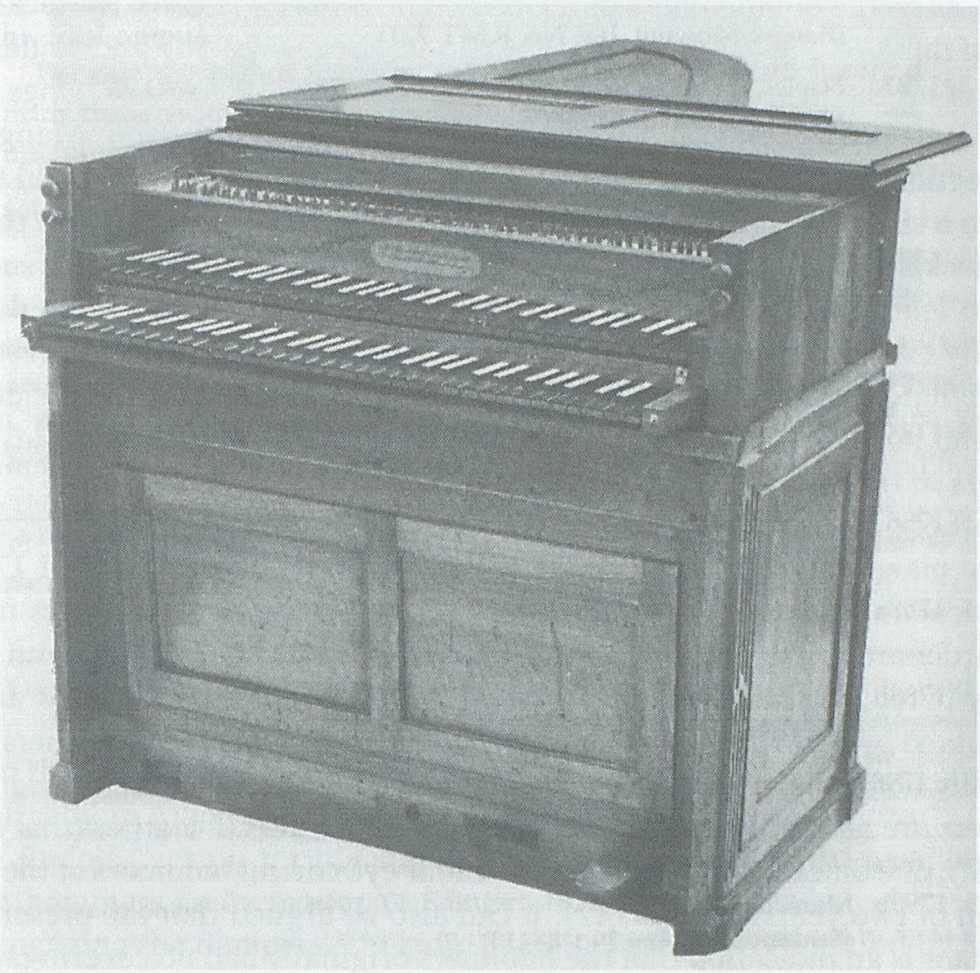

Illustration 16: The 1781 *Claviorganum* in the *Historiska Museet*, Gothenburg. The case, including the housing for the organ underneath the piano, is of walnut.

The *Hammerflügel* in the *Claviorganum* is the oldest piano by Stein to have his famous German action, the *Prellmechanik* with an escapement mechanism. There is thus no evidence that Stein invented his German action any earlier than the date of the *Claviorganum*, 1781.

Stein's German action is different in principle from the action in the 1777 *Vis-à-vis*: in the *Vis-à-vis* the hammers all pivot on one long axle mounted in a hammer rail while the escapement hoppers are mounted on the keys; in the *Claviorganum* the hammers are individually pivoted in wooden *Kapseln*, each mounted on the respective key, while the escapement hoppers are all mounted on the back rail of the key frame.

The dampers of the pianos of the 1777 *Vis-à-vis* and the 1781 *Claviorganum* also differ. In the 1777 *Vis-à-vis* (and in the pianos of the Cristofori-Silbermann tradition) the damper jacks are guided by two racks fixed in the case such that each jack rides up and down between the two strings of the choir it damps. The

damper jacks in the 1781 *Claviorganum* are guided in their own guide house and in a single fixed rack such that each jack rides up and down next to its choir of strings. Furthermore, rather than having wedges at their tops to damp the strings, as do the damper jacks of the piano of the 1777 *Vis-à-vis*, the jacks of the piano of the 1781 *Claviorganum* have blocks on their sides. The undersides of the blocks of all the jacks now have a soft leather pad to silence the strings. In the bass of later instruments by Stein there are small lengths of wood, triangular in cross section, covered in leather on two sides with the plain horizontal surface glued to a single layer of soft leather on the underside of the blocks on the sides of the jacks. Each of these little wedges falls between the two strings such that the two leather-covered surfaces damp those strings. These wedge dampers normally extend from the lowest note up to the low treble while the rest of the treble dampers each has a single thick layer of soft leather on the underside of the block and no wedge.[132] The *Claviorganum* may once have had the small wedge dampers in the bass.

Another difference between the 1777 *Vis-à-vis* and the 1781 *Claviorganum* is that the piano hammers of 1777 are of solid cherry whereas those of 1781 are cylindrical and wooden, inspired perhaps by the cylindrical hammers made of thin cardboard or paper used in the pianos of Cristofori and Silbermann. But as already noted, the hammers of the Cristofori and Silbermann pianos are each surmounted by a pad of leather, whereas the *Claviorganum* piano hammers appear originally not to have had leather.[133] The present leathers on the *Claviorganum* hammers are neither well done nor like the single layers of leather (that do look original), one on each hammer, on the similar cylindrical hammers of the pianos by Stein of two years later (ill. 17). It can also be argued that the presence of a moderator is an indication that the hammers originally had no covering: the purpose of the moderator, for instance in the 1777 *Vis-à-vis*, was probably to soften the sound of the bare wooden hammers and thus give two alternative timbres, mirroring those given by the plain hammers and those bound with wool used on Hebenstreit's *Pantalon*. If this is true, the presence of the moderator in the 1781 *Claviorganum* (not found in any later piano by Stein) adds weight to the suggestion that the hammers originally had no covering.

132 The *Hammerflügel* in Leipzig (*Musikinstrumenten-Museum der Universität Leipzig*, inv. no. 171) for instance, has wedges from FF to g♯1.

133 The ring-shaped hammers of Cristofori, Silbermann and Stein may have been inspired by dulcimer hammers. The three surviving pianos of Cristofori, two of which have the ring-shaped hammers, were built in the 1720s, well after Hebenstreit's fame had spread through Europe. Accordingly, to imitate the cloth-bound hammers of the dulcimer, the instruments of Cristofori and the Silbermanns would have had the leather pads on the hammers whereas the Verona *Vis-à-vis* and the *Claviorganum* – and indeed the instruments of other makers including Spath – had bare hammers with optional moderators.

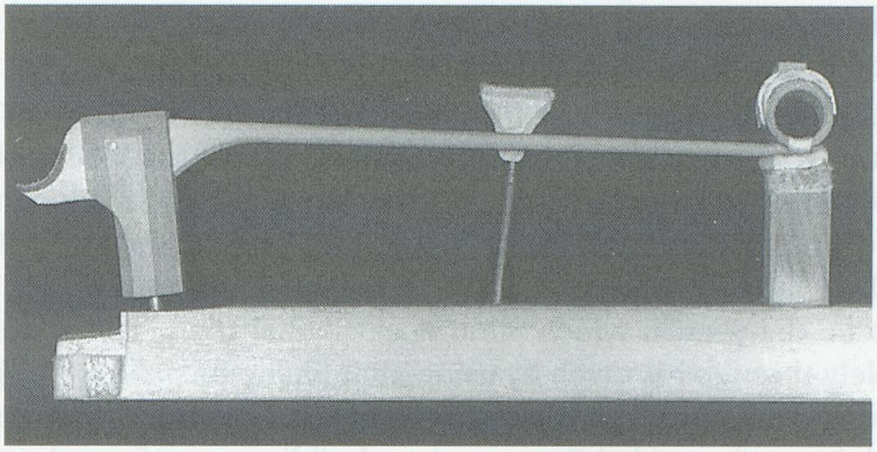

Illustration 17: A treble hammer from the 1781 *Claviorganum*. None of the hammer leather appears to be original. The end of the brass axle for the pivoting hammer is visible, fixed in the wooden *Kapsel*. The black felt bushing for the axle is inside, in the hammer shank. Later, in 1783, Stein put the bushing in the Kapsel and fixed the axle in the shank. The round hollow hammer head is made of barberry wood. In this instrument and in other *Hammerflügel* made by Stein before sometime in 1783, the hammer rest blocks are graduated in height, low in the bass to high in the treble.

Stein thus appears to have incorporated hammers with no covering and a moderator in his *Hammerflügel* up to and including 1781. Two instruments (now lost) by Stein that were once in Vienna, one owned by Gräfin Maria Wilhelmine von Thun already in March 1781 and the other ordered (through Mozart) by Graf Johann Rudolf Czernin for his wife in October 1781, may also have had bare wooden hammers and a moderator. Both would however have had knee levers for disengaging the dampers.[134] Gräfin Thun's piano was often used by Mozart. The evidence there is thus suggests that until 1781, Stein continued the *Pantalon* tradition of having bare wooden hammers and an optional moderator: certainly the 1777 *Vis-à-vis* and perhaps the 1781 *Claviorganum* had hammers with no covering; in both these instruments there was an optional moderator. Furthermore, both the 1777 *Vis-à-vis* and the 1781 *Claviorganum* offered a variety of timbres, obtained by swapping keyboards and by using different stops. The sound produced by the hammers, with or without the moderator, could be combined with that made by the harpsichord in the 1777 *Vis-à-vis* and with that of the flute in the 1781 *Claviorganum*. The pianos in both these instruments had a sound that could be varied in volume through the player's touch. In both instruments the two means to expression, touch and a choice of timbres, were available.

134 See the two letters of Mozart to his father of 24 March and 24 October 1781 in: Mozart, *Briefe und Aufzeichnungen*, *op. cit.*, III, 99 (die gräfin thun hätte mir ihr schönes steiner=Pianforte darzu gegeben) and 170 (ich kann ihnen dermalen nicht viel schreiben, weil ich noch meiner baase schreiben muß, und dem H: Stein nach Augsburg. denn der graf czernin hat mich gebeten ihm ein Piano forte für seine frau zu bestellen).

1782 – the Munich *Hammerflügel*

The next surviving instrument by Stein, a *Hammerflügel* of 1782 now in Munich, is not combined with any other instrument (ill. 18).[135] As in the 1781 *Claviorganum*, the hammer action in this piano is Stein's German action. The wooden hammers are again cylindrical but each has an under layer of leather that looks original (ill. 19). There is no moderator. The year this instrument was made, 1782, thus appears to be the year in which Stein decided that the player should express himself solely through his touch by using pliant hammers and without recourse to any auxiliary stops except a sustaining device operated by two joined knee levers. In doing so, he guided German piano building away from the tradition of the *Pantalon* towards a tradition in which the player could rely only on his touch for expression. Stein thus relinquished his position in the two traditions to which his master Spath had belonged: first, the keyed *Pantalon* tradition in which the hammers had no covering and in which there was an optional moderator to soften the sound; second, the wider tradition that offered the player a variety of stops.

Illustration 18: The 1782 *Hammerflügel* in the *Bayerisches Nationalmuseum*, Munich

135 Bayerisches Nationalmuseum, inv. no. L 99/7. There is also another later *Hammerflügel* (1792) by Stein in the Stadtmuseum in Munich.

By leathering the hammers and doing away with the timbre stops Stein seems finally to have stepped over into the Cristofori-Silbermann tradition. In that tradition the hammers had always been surmounted by pads of leather and a variety of stops had not been available.[136] In this new phase, Stein, like Cristofori before him, left it to the player to create variation in both dynamics and timbre through touch alone.

1783 – the Naples *Vis-à-vis*

In 1782 Stein seems to have decided on some of the aspects of the design of his *Hammerflügel* that he was to maintain for the rest of his life. These included the use of leathered hammers and having only the sustaining knee lever as an auxiliary device. Nonetheless, the *Vis-à-vis* of 1783, now in Naples, shows that for about another year Stein was still open to new ideas (ill. 5).

The 1783 *Vis-à-vis* has two keyboards at the harpsichord end and one at the piano end. The harpsichord, quite unlike the one of the 1777 *Vis-à-vis*, is only served by the lower of the two keyboards at the harpsichord end; the upper keyboard is for the piano at the other end and for combining the two instruments. There are three sets of harpsichord strings, two sets at 8-foot pitch and one at 4-foot pitch. For the top nine notes the 4-foot strings make use of the 8-foot bridge and are tuned to 8-foot pitch.

One set of 8-foot strings and the set of 4-foot strings are plucked by quill plectra, the other 8-foot set is plucked by soft leather plectra. The tongues in the jacks with the leather plectra are six millimetres broad whereas those in the jacks with the quill plectra are only four millimetres broad. The broader tongues were presumably made wider to allow for the larger mortises necessary for the leather plectra. This supports the idea that the leather plectra are original to the instrument. There is no buff stop.

The three harpsichord stops (8-foot, 8-foot and 4-foot) in the 1783 *Vis-à-vis* can only be engaged and disengaged by using a knee lever, not by hand. Pressing in this lever disengages first the 4-foot stop and then the 8-foot stop with quill plectra, leaving just the 8-foot stop with soft leather plectra. Similarly, in Taskin's instruments (or those enlarged by him) that have the *peau de buffle* stop there is usually no means of changing stops other than by using knee pommels and of the latter, the decrescendo knee pommel disengages the jacks with quill plectra in turn (4-foot, 8-foot and 8-foot), leaving only the *peau de buffle*. Taskin's influence on Stein is clear.[137]

136 Gottfried Silbermann's ivory plates lowered onto the strings to give a harpsichord-like sound excepted. It should also be mentioned that the sustaining device was also often treated as a timbre stop in the eighteenth century, used continuously to give a loud effect.

137 Stein had probably taken note of Taskin's inventions on his second trip to Paris, undertaken in 1773, the same year Trouflaut described Taskin's invention of 1768.

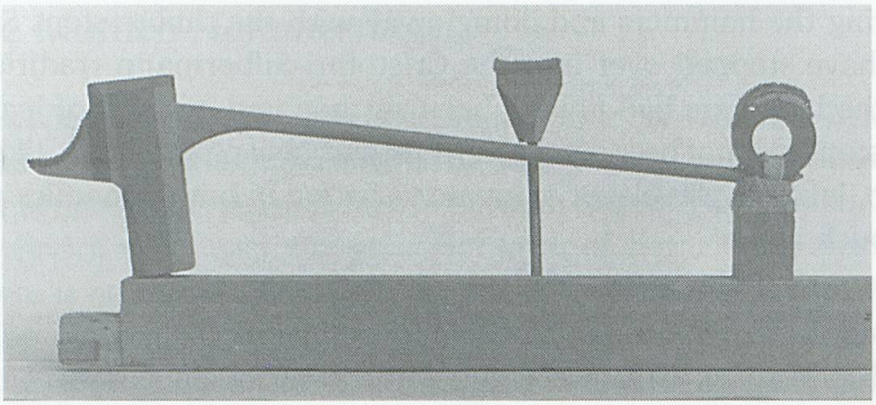

Illustration 19: A bass hammer from the 1783 *Hammerflügel* in the *Ringve Museum*, Trondheim.
The under layer of leather appears to be original, as does the single layer on each hammer of the 1782 *Hammerflügel* in Munich and of the 1783 *Vis-à-vis* in Naples

The second and third knee levers at the harpsichord end of the 1783 *Vis-à-vis* have to do with the piano at the other end. The second disengages the piano dampers while the third adds the harpsichord to the piano, this time on the upper manual at the harpsichord end. If the third knee lever is not used, the piano is available alone on the upper manual. This manual and the piano keyboard at the other end are connected by a set of squares and trackers practically the same as the set in the 1777 *Vis-à-vis*.

As in the piano of the 1781 *Claviorganum* and as in the 1782 *Hammerflügel*, the piano of the 1783 *Vis-à-vis* has Stein's German action. In this, the 1783 *Vis-à*-vis is also quite different from the one of 1777. The hammers in the 1783 *Vis-à-vis* are cylindrical, hollow and wooden, like those in the 1781 and 1782 instruments. Each hammer has a covering of leather that appears to be original: the single layers are neatly skived and applied; they are graduated in thickness from 1.3 millimetres at FF to 0.8 millimetres at f3 (ill. 19). As in the 1782 *Hammerflügel* and the piano of the 1777 *Vis-à-vis*, the piano of the 1783 *Vis-à-vis* has two joined knee levers for disengaging the dampers. There are no other auxiliary stops for the piano.

In itself the piano of the 1783 *Vis-à-vis* retained the innovations found in the 1782 *Hammerflügel*, that is, the leathered hammers and no stops except for the one for disengaging the dampers. But by combining this *Hammerflügel* with a harpsichord, French in style, Stein looked back to the tradition of providing the player with a variety of timbres. Even so, by the time Stein made the 1783 *Vis-à-vis* two technical details suggest that the harpsichord was no longer in the foreground of his mind. The first of these is that the strings at the harpsichord end (with a c2 string length of about 310 millimetres) are almost as short as those of the piano (with a c2 string length of 302 millimetres). According to the 1769 description of the *Poly-Tono-Clavichordium* the differences in string lengths

and string thicknesses are essential to a good sound. In the 1777 instrument the harpsichord has longer, thinner strings while the piano has shorter, thicker strings. In the 1783 instrument Stein appears to have chosen thicker, shorter strings for the harpsichord as well as for the piano. The required differences in string lengths (and by implication in thicknesses) are thus demonstrated by the 1777 *Vis-à-vis* but not by the 1783 *Vis-à-vis*. In the latter, Stein seems to have gone back on his own idea. The harpsichord in the 1783 *Vis-à-vis*, it might be said, was reduced to a plucking piano.

The second hint that the harpsichord was no longer so important to Stein lies in the fact that the bridge for the 8-foot strings of the 1783 harpsichord is marked out as if the instrument were to have been strung as a piano, that is, with the two strings of each pair close to each other (so that the hammers could strike them) instead of as in a harpsichord, that is, with the two strings far apart (so that the jacks could rise between them). In a harpsichord, the two pins of each apparent pair, close together on the bridge and the nut, are in fact for two adjacent notes and not a pair at all. This can easily be confirmed by looking at the solitary pin at either end of the 8-foot bridge of a harpsichord with two 8-foot unisons. It then becomes clear that the true pairs of pins in a harpsichord are those spaced widely apart. In the harpsichord of the 1783 *Vis-à-vis*, an extra pin position is marked just beyond the last bridge pin, the one for the short 8-foot string for f3, thus forming a narrow pair as if for a piano. Similarly, there is an extra bridge pin hole (not only marked but also drilled) just beyond the last pin in the bass, the one for the long 8-foot string for FF, again forming a narrow pair. The bridge, it seems, was marked out as if it were to have been a piano bridge.

The 1777 *Vis-à-vis*, perhaps a unique instrument in Stein's *œuvre*, was changed while it was being made to an instrument combining a German harpsichord with a *Pantalon*. The 1783 *Vis-à-vis* shows no signs of having been changed, indicating that by 1783 this later type of *Vis-à-vis*, combining a version of Taskin's expressive French harpsichord with one of Stein's latest *Hammerflügel*, that is, one with leathered hammers and no auxiliary stops except the sustaining device, may have become one of the standard products of the Stein firm. That his French harpsichord had strings close in length to those of a piano rather than the longer strings appropriate to a harpsichord shows a change in Stein's interest. His long-standing involvement with the harpsichord proper seems to have faded, replaced, perhaps only for a short period, by an excitement with two of the last novelties invented for the harpsichord, Taskin's *peau de buffle* and the diminuendo knee lever.[138] But while Taskin used his leather plectra as substitutes for quill plectra

138 The harpsichord 'Fait par Pascal Taskin a Paris 1782' in the Museu da Música in Lisbon, inv. nr. MM 1096 has a longest c2 string of 362 mm; those of the 1777 *Vis-à-vis* are 336 mm (harpsichord) and 297 mm (piano); those of the 1783 *Vis-à-vis* are 310 mm (harpsichord) and 302 mm (piano).

in a fully-fledged French harpsichord, Stein used the same leather plectra in a harpsichord conceived with the piano foremost in his mind.[139]

1783 – Stein's *Saitenharmonika*

In 1783 Von Stetten reported that Stein made an instrument that could reduce in sound from the greatest *Fortissime* to 'complete nothingness'.[140] Comparing this description with later ones shows that this instrument must have been Stein's *Saitenharmonika*.[141] According to Johann Friedrich Christmann (1752–1817), writing in 1788, this exceptional instrument had three strings for each note, two for a hammer action and one for a special plucking action:

> All that I could write about this instrument might be summed up in the words: it is unique. In its external form and size it is entirely similar to a normal *Steinischer Flügel*, splendidly worked up in the antique style. But its effect, dear friend, its effect is beyond all description and so, as everyone must acknowledge, no one but Stein could produce such a masterpiece of mechanical art. It consists of an absolutely splendid

139 In his grand pianos, Taskin used shorter string lengths. The *piano en forme de clavecin* by him in the Musée de la Musique, Paris, on loan from the Musée de Louvre, inv. no. OA 10298, dated 1788, has a c2 string 308 mm long. Compare with the harpsichord by him in the previous note.

140 „Unter die neuesten Kunstarbeiten unsers berühmten Herrn Steins gehören ein nach Schweden verfertigtes Clavecin organisé, sodann ein sogenannter Vis à Vis oder Doppelflügel, der seiner besondern Mechanick wegen, von einer einzelnen Person zu beiden Seiten zugleich gespielt werden kann, wodurch eine Menge Veränderungen, und das nicht aus Künstelen, sondern einer natürlichen Verwechslung der Sachen selbst, entstehen; ferner ein seiner Gestalt nach gemeines, im Ton aber verschiedenes Piano forte. Das An- und Abwachsen ist in solchem Grad, daß es sich aus dem erhabensten Fortissime, allmählich abneigt, und in gänzliches Nichts verwandelt. Der Künstler hat bey gelegenheit der 1783. gewesenen Austellung der Kunstarbeiten, beyde letztere in seinem Hause den Liebhabern vorlegt." (Among the newest works of art of our famous Herr Stein are a *Clavecin organisé* sent to Sweden, a so-called *Vis à Vis* or *Doppelflügel*, which, on account of its special mechanism, allows a single person to play both sides at once, through which a large number of changes of timbre [*Veränderungen*] – not artificial ones but ones produced through a natural exchange of things – can be made. Further, a *Piano forte*, normal in appearance but differing in sound. The increase and decrease is of such an extent that the greatest *Fortissime* gradually reduces to complete nothingness. The artist presented the latter two to the *Liebhaber* at his house on the occasion of the exhibition of art works in 1783.) Von Stetten the Younger, *Kunst- Gewerb- und Handwerks-Geschichte*, *op. cit.*, 1788, 56. Von Stetten was probably a client of Stein's. J. D. Schiedmayer, when a journeyman at Stein's, was sent out to a Von Stetten on the 24th April 1799 and received there 'Dranckgeld' (a tip), probably for tuning (Schiedmayer and Schiedmayer, *The Schiedmayer notebook*, *op. cit.*, fol. 18v.). On New Year's Eve 1780 Schiedmayer noted that he received „... beÿ Hern von Stetten von das neue Instrument Drankgeld" (a tip for the new instrument at the house of Herr von Stetten), presumably a piano from Stein (*ibid.*, fol. 22r.).

141 Although no *Saitenharmonika* has survived, John Koster has cogently argued that the 1783 instrument now in Boston may once have been a *Saitenharmonika*. See: Koster, *Keyboard Musical Instruments*, *op. cit.*, 133–46.

double-strung *Fortepiano* as the basis of its whole harmony. You are familiar with the solid tone of these instruments and know that the quality of the sound depends only on the greater or lesser pressure of the finger. Nevertheless, there has always been a gap between the *Pianissimo* and complete nothingness, and Herr Stein has filled this gap. He gave the instrument one more string, set in vibration and made to sound by a very elastic material. This *Veränderung*, which Stein, in honour of his country, does not call an English harp but rather a primeval German spinet, is so constructed that it can be played either alone or combined with the *Forte Piano*. In the latter case the spinet gives the *Forte piano* an excellent edge. The *Forte piano* may also be played alone. The effect that the combination of the two brings forth can be heard but not described. Even more special is the way the sound fades away completely. This happens when the *Forte Piano* at its softest is exchanged for the spinet and then completely brought to nothingness through a little pressure. I cannot describe for you in words the experience of this to the listener. The instrument is now in Mannheim. On his trip there, the amiable Stein could not resist visiting his home town, a small Palatine village. He arrived with his able daughter, summoned his old friends, the elderly of the village, and spent a delightful day with them. He unpacked his *Saitenharmonika*, and his daughter had to play on this divine instrument all day long for the young and the old, for Christians and Jews and Anabaptists. Herr von B., its present owner, not only paid the agreed 100 Louis d'or but also presented the inventor with a gift of a cask of Rhine wine and reimbursed his travelling expenses.[142]

142 „Antwort auf die Anfrage wegen Herrn Steins neuerfundener Saitenharmonica, aus einem Brief des Herrn Pf. Christmanns an J..
– Alles was ich Ihnen von diesem Instrumente schreiben kann, besteht kurz darinn: es ist das Einzige in seiner Art. In seiner äusserlichen Form und Größe ist es einem gewöhnlichen Steinischen Flügel vollkommen ähnlich, vortrefflich im antiken Geschmak gearbeitet: aber sein Effekt, l. Fr. sein Effekt ist über alle Beschreibung und so, daß jeder gestehen muß: Niemand als Stein konnte ein solches Meisterstük der Mechanik liefern. Es besteht in einem ganz vortrefflichen, zweifach bezogenen Fortepiano, als Grundlage der ganzen Harmonie. Sie kennen den soliden Ton dieser Instrumenten; Sie wissen, daß die Bildung desselben blos in dem mehr oder wenigeren Druk des Fingers besteht: nichtsdestoweniger blieb uns doch immer bei dem Pianissimo eine Lüke auf das völlige Nichts, und diese Lüke hat Herr Stein ausgefüllt. Er gab dem Instrument noch eine Saite mehr, die durch eine sehr elastische Materie in Bewegung gesezt und zum Klang gebracht wird. Diese Veränderung, die Stein zur Ehre seiner Nation nicht englische Harfe; sondern ein uraltes deutsches Spinetchen nennt, ist so angebracht, daß es sowohl ganz allein, als in Verbindung mit dem Forte Piano kann gespielt werden, und in diesem Fall theilt das genannte Spinet dem Forte piano ein vortreffliche Schärfe mit. Eben so kann auch das leztere für sich allein gespielt werden. Der Effekt, der dieser beiden Verbindung hervorbringt, läßt sich nur hören, aber nicht beschreiben. Noch viel sonderbarer ist das völlige Erlöschen des Tons. Es entsteht, wenn dort das Forte Piano in seiner größten Schwäche dem Spinet übertragen und durch einen kleinen Druk zum völligen Absterben gebracht wird. Was der Zuhörer dabei fühlt, kann ich Ihnen unmöglich mit Worten schildern. Das Instrument steht nun in Mannheim. Auf seiner Reise dahin konnte sich der liebenswürdige Stein unmöglich überwinden, seinen in der Nähe liegenden Geburtsort, ein unbedeutendes pfälzisches Dorf zu besuchen. Er kam mit seiner geschikten Tochter dahin, rief seine alten Bekannten, die Greisen des Dorfs zu sich, machte sich mit ihnen einen vergnügten Tag, pakte seine Saitenharmonika aus und seine Tochter mußte dann Kleinen und Großen, Christen und Juden und Wiedertäufern den ganzen Tag über auf diesem göttlichen Instrumente spielen. Herr von B. sein gegenwärtiger Besitzer bezalte für dasselbe nicht nur die akkordirte 100 Louis d'or; sondern machte noch

There is nothing in this or any of the other descriptions to indicate that there was a separate nut or bridge for the third set of strings so it seems likely that the three sets differed in their lengths only inasmuch as their three bridge pins followed the line of the bridge, a matter of a few millimetres. The description makes clear that the 'spinet' could be played without the piano and *vice-versa*. The two could also be combined.

There is evidence to suggest that the 'very elastic material' of the plectra was *peau de buffle*; by 1783 Stein had visited Paris and had almost certainly been impressed there by Taskin's invention; so much was already clear from the 1783 *Vis-à-vis*. Furthermore, in a letter sent in 1789 from Naples, the Austrian diplomat Norbert Hadrava, who acted as a supplier of Stein's instruments, wrote in that context that the word *buffle*, referring to the leather plectra (*peau de buffle* or buffalo leather), would sound somewhat ludicrous in Italian and that he preferred the word *Harmonika* when referring to the leather plectra stop in his dealings with the Italian market.[143] The idea that the 'elastic material' was soft leather is further supported by another description of a *Vis-à-vis* by Stein. In his travel diary of 1783, Otto Carl Erdmann von Kospoth (1753–1817) wrote of a visit to Stein on July the 9th of that year:

> After church I went to the famous instrument maker Stein and saw his entirely wonderful instruments. Essentially he had a large *forte piano* with three keyboards at the ready, 2 of them stand one above the other and the 3rd opposite, at the foot of the *Instrument*. The lower keyboard has quill plectra and includes a stop with leather instead of the quill, giving a heavenly sound; the other and opposite keyboard has hammers partly of leather, partly of bone. By means of trap work under the instrument all the stops can be played, partly separately, partly coupled, so that one believes that 5 to 6 people are playing.[144]

überdies dem Herrn Erfinder ein Geschenk mit einem Faß Rheinwein und gab ihm Ersaz der Reiskosten. Die merkwürdige Biographie dieses großen Mechanikers werden Sie mit der Zeit in meinem Wörterbuche finden." Heinrich Philipp Carl Boßler (ed.), *Musikalische Real-Zeitung* 45, Speier 1789, col. 352–3. The English translation is largely taken from: Koster, *Keyboard Musical Instruments*, *op. cit.*, 140.

143 See: John Rice, 'Stein's "favorite instrument": A vis-à-vis piano-harpsichord in Naples', *Journal of the American Musical Instrument Society* XXI, 1995, 30–64. Hadrava was also a musician and imported instruments by Stein into Italy.

144 „Nach der Kirche ging ich zu dem berühmten *Instrumenten Macher Stein*, und besah seine ganz vortrefflichen *Instrumente*, hauptsächlich hatte er ein großes *forte piano* mit drei *Claviren* fertig, 2 derselben stehen übereinander, und das 3te gegenüber am Fuß des *Instruments*. Das untere *Clavir* ist mit Federkielen, worunter ein Zug mit Leder anstatt der Kiele, welches einen göttlichen Ton hervorbringt, das andere und gegenüberstehende *Clavir* ist mit Hämmern theils Leder theils bein, so daß alle Züge vermöge Klappen unterm *Instrumente* theils einzeln, theils gekoppelt gespielt werden, so daß man glaubt es spielen 5 bis 6 Personen." Von Kospoth, *Von Berlin nach München und Venedig*, *op. cit.*, 30. The composer Otto Carl Erdmann von Kospoth was appointed *Kammerherr* and *maître de plaisirs* at the court of Frederick the Great.

Exactly how the hammers were constructed and how the bone was used is not clear but there is no doubt about the quill and leather plectra for the harpsichord and the idea of different timbres pervades the description.[145]

Another account of Stein's *Saitenharmonika* was given in a letter written by Johann Friedrich Reichardt (1752–1814) from Paris at the beginning of the nineteenth century. Reichardt remembers Stein's pride in his talented daughter Nannette and his interest in the diminuendo and the *pianissimo*, as in Christmann's account:

> This made me think of an interesting occasion I once enjoyed with the truly ingenious instrument maker Stein in Augsburg. I visited him to hear the new instrument that he had then invented and made for his daughter. On this instrument one could execute the *crescendo* and *diminuendo* with very consummate skill. 'You should hear that from my daughter herself, she knows how to do it!' exclaimed the old artist with redoubled pleasure. Someone was sent to find his daughter who, I came to realize later, was as an excellent piano player. But meanwhile, with much love and great passion, the old master could not forbear from describing to me the nature of the instrument and the perfection of the *diminuendo*. He said with the most concentrated expressions and gestures: 'At the last you still believe you can hear something but you hear nothing, really nothing, absolutely really nothing.' Under the hands of his artistic daughter it was truly so. Because of the amount of labour involved he said he would not construct any more of these instruments. I hope that Herr Stein does not keep to his resolution. It was truly the crown of his gifted and exceedingly beautiful work.[146]

145 Adlung however, in his description of Fickert's instrument, described hammers of horn. See: note 77.

146 „Ich dachte dabei einer interessanten Scene, die ich einst mit dem ächt-genialischen Instrumentenmacher Stein in Augsburg hatte. Ich besuchte ihn, um ein neues Instrument, das er damals eben erfunden und für seine Tochter gemacht hatte, zu hören, auf welchem man das Crescendo und Diminuendo auf eine sehr vollkommne Art sollte ausüben können. Das müssen Sie von meiner Tochter selbst hören, die weiß damit umzugehen! Rief der alte Künstler mit doppelt frohem Bewußtseyn. Es ward nach der Tochter geschickt, in der ich hernach eine vortreffliche Klavierspielerin kennen lernte. Während dessen aber konnte der alte Meister doch nicht unterlassen, mir die Natur des Instruments mit vieler Liebe und mit großem Eifer zu beschreiben, und um mir die Vollkommenheit des Diminuendo zu schildern, sagte er mit den angespanntesten Sinnen und Gebehrden: ‚Sie glauben zuletzt noch immer was zu hören, Sie hören aber nichts, gar nichts, rein gar nichts.' Es war unter den Händen der Künstlerin auch wirklich so. Ich wünsche, daß Herr Stein nicht mag bei seinem Vorsatz geblieben seyn, dergleichen Instrumente, der vielen Arbeit wegen, weiter nicht zu verfertigen. Es war wahrlich die Krone seiner überaus schönen genialischen Arbeiten." Johann Friedrich Reichardt, *Vertraute Briefe aus Paris geschrieben in den Jahren 1802 und 1803*, 2 vols., I, (2nd ed.) Hamburg 1805, 334–5.

Ignace Joseph Senft

The label of a square piano of 1804 by Senft, mentioned above as a journeyman in Stein's workshop in Augsburg, reads as follows:

> Ignace Joseph Senft / faiseur d'Orgues de Clavecins de forte-piano / grands et petites et de forte-piano Vis à vis / à Augsbourg[147]

That Senft actually made *vis-à-vis* instruments is evidenced by an advertisement placed in a 1793 Koblenz newspaper describing a *vis-à-vis Flügel*. Shelley Davis summarized the text as follows:

> Senft's instrument had three keyboards, of which two were pianos, the third a harpsichord with leather plectra. Each piano keyboard had its own strings and soundboard, the two pianos were placed against each other to form a rectangle and the performers faced each other. [...] The leather plectra could be used with one set of piano strings by means of a coupling device, thus adding a new tone color to the softer sounds. All three keyboards, joined by trackers and squares, could be used simultaneously. The advertisement also stated that this instrument, capable of creating a full fortissimo, could also provide a diminuendo to a faint piano that could in turn die away – through a fleeting touch of the leather plectra – to silence.[148]

Although this description is not completely clear, the reminders of elements from both Stein's 1783 *Vis-à-vis* and from the description of the *Saitenharmonika*, both of ten years earlier, are strong. If Senft used soft leather for harpsichord plectra he may have had this idea from the time when he worked with Stein, tending to confirm that Stein's 'very elastic material' used for the plectra of the *Saitenharmonika* was indeed soft leather.

Senft's instrument represents a further development of Stein's 1783 *Vis-à-vis*. The latter has at one end a *Hammerflügel* with leathered hammers combined at the other end with a harpsichord that had an 8-foot stop and a 4-foot stop, both using jacks with quill plectra, and another 8-foot stop using jacks with leather plectra. Of these, Senft appears to have retained only the single set of jacks with leather plectra, substituting a *Hammerflügel* for the other two quilled stops. In other words, Senft adopted Stein's design of his 1783 *Vis-à-vis* but replaced the harpsichord end with a *Saitenharmonika*, albeit one with a separate keyboard for the harpsichord stop using *peau de buffle*. Perhaps Senft's time with Stein as a journeyman included the year 1783 in which the *Saitenharmonika* was apparently invented and the Naples *Vis-à-vis* was made.

147 The instrument (Metropolitan Museum of Art Acquisition no. 89.4.3136.) is dated 1804 under the soundboard. Another instrument with the same inscription but on the nameboard is in the Berlin Musikinstrumenten-Museum, cat. No. 1280. A *Hammerflügel* with a similar inscription but written in somewhat italianized French on a depiction of a tablet supported by a cupid (Ignace / Joseph Senft / Faiseur d'Orgues / de Clavecina / de Piano-forte / granda et petita / de Piano- forte / Vis - à - via / à Augsbourg) is in the Germanisches Nationalmuseum, inv. no. MIR 1105.

148 See: Davis, 'The orchestra under Clemens Wenzeslaus', *op. cit.*

Expression in soft playing

As in the descriptions of the *Saitenharmonika*, Trouflaut's description of the effects of Taskin's *peau de buffle* emphasized gentle sounds and the *diminuendo*:

> Does one require passionate, tender, or dying sounds? The *buffle* obeys the pressure of the finger; it no longer plucks but caresses the string. The touch, just the touch of the clavecinist is enough to create these charming shadings without changing either keyboard or stops ...[149]

Other makers were keen to advertise the loudness of their instruments. One of these was J. D. Schiedmayer; he worked with Stein from 1778 to 1781. Schiedmayer seems to have been proud to have it announced that his *Hammerflügel* could sound 'supernaturally loud'.[150] Both Stein's 1769 *Poly-Tono-Clavichordium* and his 1777 *Vis-à-vis* had three 8-foot stops and a 16-foot stop, all of which could be coupled with a *Hammerflügel*. In this *Vis-à-vis*, and probably too in the *Poly-Tono-Clavicordium*, the hammers had no leather and were thus capable of making a loud sound. Surely all this was intended to create impressive dynamics. But by 1783, after Schiedmayer had left, Stein seems to have changed, no longer interested in loud sounds but rather in soft and expressive performance. 1783 was the year of the *Saitenharmonika*, with its extraordinary diminuendo, and the 1783 *Vis-à-vis*, influenced by the soft dynamic effect of Taskin's *peau de buffle* and the diminuendo knee pommel.

More evidence that from about 1783 onwards Stein was not concerned with loud expression comes from his pianos. First, in 1783 he changed from having three strings in the treble (and two for the rest of the compass) to two strings for each note throughout the five-octave compass.[151] Second, as mentioned above, a comparison of a stringing list for a piano (about 1777) given in Stein's own notebook with the string gauges still marked on three of his pianos (of 1782, 1786 and 1788) indicate that Stein did not essentially change the diameters of the strings in the design of his pianos from about 1777 until at least 1788.[152] Third, the small, light hammers of Stein's pianos remained the same in size between 1783 and 1792.[153] A maker who wanted to increase the power of his instruments

149 « Désire-t-on des sons passionnés, tendres, mourans? Le buffle obéit à l'impression du doigt; il ne pince plus, mais il caresse la corde; le tact enfin, le tact seul du Claveciniste suffit pour opérer alternativement, & sans changer ni de clavier, ni de registres, ces vicissitudes charmantes. » Trouflaut, « Lettre aux auteurs de ce journal », *op. cit.*, 13.

150 „... ganz übernatürlich stark". C. F. Cramer (ed.), *Magazin der Musik* I/2, 1783, 1021–2. For J. D. Schiedmayer in relation to Stein, see: Latcham, 'The *Hammerflügel* of Johann David Schiedmayer', *op. cit.*, 7–31.

151 The 1777 *Vis-à-vis*, like the pianos of Silbermann and Cristofori, is double-strung throughout.

152 1782: Bayerisches Nationalmuseum, Munich, inv. no. L 99/7; 1786: Musée des Instruments de Musique, Brussels, inv. no. M.I.1634; 1788: Germanisches Nationalmuseum, Nuremberg, inv. no. MIR 1097.

153 These observations are based on the author's examination of all the surviving pianos by Stein.

would not only have changed from double stringing to triple stringing rather than the other way round but would also have tended to use thicker strings and larger, heavier hammers as time went by.

J. D. Schiedmayer, after leaving Stein in 1781, apparently continued to make his *Hammerflügel* with an optional moderator and round hollow *Pantalon* hammers, presumably as he had learnt from Stein when he was with him from 1778 to 1781.[154] Perhaps if Schiedmayer had stayed longer he would have learnt to appreciate a different approach, one in which the softer aspects of expression were emphasized. If he had stayed until late in 1783, he would have witnessed one final important innovation in Stein's action design: at some time in 1783 Stein changed from using the cylindrical hollow hammers to small solid ones, but still with a layer of leather (ill. 20).[155]

Stein's daughter Nannette maintained her father's complete design in the firm's pianos, including the small leathered hammers and no moderator, with no essential changes until well after Stein's death in 1792.[156] In 1796 Johann von Schönfeld (1750–1821) compared the instruments of Anton Walter (1752–1826) with those of Nannette Streicher in his *Jahrbuch der Tonkunst in Wien und Prag*:

> ... we also divide our pianos into two classes: those made in the style of Walter and those made in the style of Streicher. By close observation we can also detect two classes of players amongst our best piano players. One of these classes loves a great musical treat, that is, a powerful sound; to that end they play with a rich sound, extremely fast, study the most difficult runs and the fastest octaves. This requires authority and a strong nerve. Such players, whose strength knows no moderation, require pianos that can take any excesses.
>
> For the virtuosi of this kind we recommend the Walter style of piano. The other class of player seeks nourishment for the soul, and loves playing that is not only clear but also soft and melting. These can choose no better instrument than the Streicher or so-called Stein type.[157]

154 See: Latcham, 'The *Hammerflügel* of Johann David Schiedmayer', *op. cit.*, here, 21–5.

155 The *Hammerflügel* in the Naples *Vis-à-vis*, in the Ringve Museum Trondheim (inv. no. RMT 771), in the Museum of Fine Arts, Boston, (acc. no. 1977.63) and in private ownership in Germany are all of 1783 and all have the round hollow hammers. Stein also changed the internal construction of his pianos and added a gap spacer in 1783. Chronologically, these innovations are all first found in the 1783 *Hammerflügel* by Stein in Leipzig (Musikinstrumenten-Museum, University of Leipzig, inv. no. 171) and then in all the subsequent pianos by Stein. See: Latcham, 'Mozart and the pianos of Johann Andreas Stein', *op. cit.*

156 See: Latcham, 'The development of the Streicher firm of piano builders under the leadership of Nannette Streicher, 1792–1823', *op. cit.*

157 „... so theilen wir unsere Fortepiano in zween Klassen: die Walterischen und Streicherischen. Eben so haben wir auch bei genauer Aufmerksamkeit zwei Klassen unter unsern grössten Klavierspielern. Eine dieser Klassen liebt einen starken Ohrenschmauss, das ist, ein gewaltiges Geräusche; sie spielt daher sehr reichtönig, ausserordentlich geschwind, studiert die häckeligsten Läufe und die schnellsten Octavschläge. Hiezu wird Gewalt und Nervenstärke erfordert; diese anzuwenden, ist man nicht mächtig genug, eine gewisse Moderation zu erhalten, und bedarf also eines Fortepianos, dessen Schwebung nicht überschnapt.
„Den Virtuosen dieser Art empfehlen wir ein walterisches Fortepiano. Die andere Klasse unserer grossen Klavierspieler sucht Nahrung für die Seele, und liebt nicht nur deutliches, sondern auch

Nannette, it seems, maintained her father's interest in quiet expression. Her surviving pianos bear this out until 1805, the year she too began to respond to the demand for ever more volume.[158]

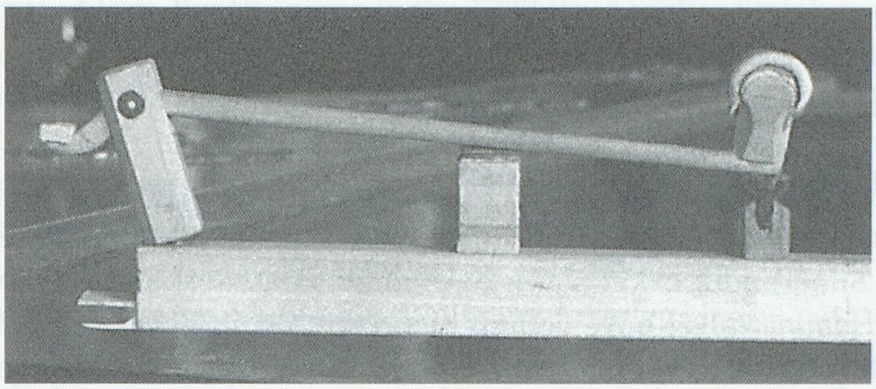

Illustration 20: A solid wooden hammer (bass) from the 1783 *Hammerflügel* in the *Musikinstrumenten-Museum*, University of Leipzig.
The under layer of leather (white) appears to be the only original one and is similar to the under layer on other *Hammerflügel* by Stein of after 1783. The *Kapsel* shape and the beak shape are very different from those of the same parts in the 1783 Ringve instrument. Furthermore, in the Ringve instrument, the hammer axle is fixed in the *Kapsel* and the bushing is hidden in the shank; here, the hammer axle is fixed in the shank and the bushing is in the *Kapsel*. The hammer rest block is also different. Compare with illustration 19.

Stein's older interest (exhibited in the 1769 *Poly-Tono-Clavicordium* and the 1777 *Vis-à-vis*) in the sound of 'a complete orchestra', certainly in terms of a variety of timbres and probably also in terms of a considerable volume, was soon forgotten by those in his surroundings. In his own lifetime, Stein's fame rested largely on the type of *Hammerflügel* he made from about 1782 onwards. Already in 1783, a certain W. G., writing in the *Magazin der Musik*, specifically condemned Wagner for his *Clavecin roïal* as well as other makers for similar instruments with a variety of timbres, praising the simplicity of Stein's *Pianoforte*:

> I do not understand why one needs a lute, a harp and a *Pantalon* sound to make a *Crescendo*. These gentlemen line their carts with straw and believe they have invented a new coach. If they knew about the qualities of a Stein *Pianoforte* they would imitate them (if they could) and throw away many of their little inventions.[159]

sanftes, schmelzendes Spiel. Diese können kein besseres Instrument, als ein Streicherisches, oder sogenanntes Steinisches wählen. Die Zwischenklasse der Virtuosen werden ausserdem nicht verlegen seyn, gute Instrumente nach jedem Geschmacke und nach jedem Preise zu finden." Johann Ferdinand von Schönfeld, *Jahrbuch der Tonkunst von Wien und Prag*, Vienna 1796 (facs. Munich and Salzburg 1976), 90–1.

158 See: Latcham, 'The development of the Streicher firm of piano builders under the leadership of Nannette Streicher, 1792–1823', *op. cit.*

159 „Ich begreife es nicht, wie man zu einem Crescendo Lauten-Harfen- und Pantalonstöne nöthig hat? Diese Herren füttern ihren Leiterwagen mit Stroh, und glauben, sie haben eine neue Carosse erfunden. Wären ihnen die Eigenschaften eines Steinischen Pianoforte bekannt, sie würdens

W. G. must have had little knowledge of Stein's previous work and had obviously never heard the *Poly-Tono-Clavichordium* or one of the *Vis-à-vis*. Perhaps if he had he would only have been confused. He was, after all, merely an anonymous follower of fashion.

Conclusion

Cristofori initiated one tradition and Hebenstreit inspired another. Both traditions found continuity in the work of Gottfried Silbermann, Spath and Stein. On the one hand, Silbermann is known to have made *Pantalons* and on the other, his surviving *Hammerflügel* have actions that copy Cristofori's later action. Spath and Stein belonged to the *Pantalon* tradition in that they used hammers with no covering and a moderator to soften the sound those hammers produced, but followed the Cristofori tradition in the type of the dampers they used and, in Spath's case, perhaps in his use of the intermediate lever and probably in his development of Cristofori's *una corda* – apparently only a tuning aid for Cristofori – into a musical tool for making a different, softer sound. In 1777 Stein may well have been following the Cristofori tradition by using the inverted wrestplank and an escapement action in which the hammers are mounted independently of the keys. Stein added one facility not found in Cristofori's pianos: the means of operating the dampers all at once while playing. The first mention of such knee levers in the history of the piano is to be found in the 1769 description of Stein's combined harpsichord-piano, the *Poly-Tono-Clavichordium*. The dampers of that instrument were only used when needed, for instance for playing staccato, perhaps reflecting the way in which the *Pantalon* player would damp the strings, that is, only when required. By 1777, Stein had changed his design in this respect; in the 1777 *Vis-à-vis* the dampers are normally engaged and disengaged when required, as on a modern piano, but with joined knee levers rather than a pedal.

The two *vis-à-vis* instruments by Stein not only show his genius and his extraordinary ingenuity, for instance in the unique piano action of the 1777 *Vis-à-vis*, but also his eclecticism. For the 1777 *Vis-à-vis* he drew inspiration from different German traditions. One of these, supremely exemplified in the 1777 *Vis-à-vis*, offered the player a wide range of timbres that could be combined and contrasted at a single instrument. But the combination of a German harpsichord with a piano in that instrument, although astonishing today, was something not only already found in Stein's *Poly-Tono-Clavichordium* of 1769 but before that date in Spath's combination of a *Forte-piano Clavecin* with a quilled *Flügel*. Fickert of Zeitz may already have invented such a combination by 1742.

nachmachen, wenn sie könnten, und viele von ihren Kleinigkeitserfindungen wegwerfen." W. G., „Schreiben über des Hrn Oebergs, Wagners und Hofrath Bauers musicalische Erfindungen", *Magazin der Musik*, I/2, 1783, 1009–13.

The mixture of eclecticism and innovation is also found in the 1783 *Vis-à-vis*. The leather plectra and the decrescendo knee lever for the harpsichord were almost certainly inspired by the work of the Parisian maker Taskin while the leathered ring-shaped hammer heads of the piano may derive from the Cristofori-Silbermann tradition. But the piano in the 1783 *Vis-à-vis* has Stein's own German action, a product of his genius, invented already by 1781. This action served as the basis for a new German tradition of piano building and, in an adapted form, as the basis for the development of that tradition in Vienna.

Stein was much revered in his day and was the foremost stringed keyboard instrument maker in German-speaking lands. Leopold Mozart was one of his admirers. Judging by the 1769 *Poly-Tono-Clavichordium* and the 1777 *Vis-à-vis,* the musical atmosphere surrounding Wolfgang Amadeus in the period in which these two instruments were made appears to have been one in which the harpsichord still played an important part despite a growing interest in the newer instruments with hammers. But that interest in the piano on the part of musicians was probably an interest in the possibility of using touch to give expression, not in the actual little hammers. Today harpsichords and pianos are often sharply distinguished on account of the technical differences in their actions, differences between plectra and hammers. In the eighteenth century the two instruments would probably have been more often distinguished on account of the expressive possibilities they offered. Generally speaking the harpsichord was less immediately expressive, the piano more, although some harpsichords, notably those equipped with plectra of *peau de buffle*, were considered more expressive than some pianos, at least in certain quarters.

Stein's interest appears to have changed in emphasis from enabling the player to express himself using both touch and different timbre stops to using touch only. Concurrently, Stein seems to have changed from having an interest in a wide dynamic range to an interest in the quiet end of the sound spectrum. Mozart cannot be said to have changed in the latter respect, but at the time he visited Stein, in 1777, he may well have expected to play pianos that had bare hammers as well as numerous stops for different timbres. At that time too, he was probably still accustomed to the harpsichord as well as to the piano. By about 1782 however, Mozart's idea of the expressive *Clavier* may well have changed in much the same way as Stein's, at least regarding the use of different sound colours. By that time Mozart probably no longer expected to play on harpsichords and pianos but only on pianos.[160] The pianos by Stein would have offered leathered hammers that responded to Mozart's touch for expression. No longer would those pianos have had any auxiliary stops except for the sustaining device.[161]

160 Pianos were not always available however, in which case a harpsichord was used.

161 The piano by Walter acquired by Mozart in 1782 had a moderator. But the sort of action this instrument had when Mozart owned it is not known. Perhaps it too had bare wooden hammers. The present action dates from after Mozart's death. See: Michael Latcham, 'Mozart and the pianos of Gabriel Anton Walter', *Early Music*, XXV/3, August 1997, 382–400.

Stein's perennial dissatisfaction with his *Hammerflügel*, the instrument that made him so famous, seems to have been laid to rest by the end of 1783, the year in which he appears to have ceased giving thought to different timbres, including those of the harpsichord, even when that instrument was made expressive through the use of soft leather plectra. To come as close as he could to his ideal of the expressive *Clavier*, he relinquished his interest in timbre stops and turned exclusively to pianos that had little solid hammers with a leather covering. In so doing, he returned to what must have been Cristofori's original intention: to make the harpsichord more expressive simply by substituting leathered hammers for the plectra.

Summary

In this article the two so-called vis-à-vis instruments by Johann Andreas Stein are described and placed in their eighteenth-century context. One of these, of 1777, belongs to the collection of the Castelvecchio Museum in Verona; the other, of 1783, is to be found in the collection of the Conservatorio di Musica San Pietro a Majella in Naples. Both these instruments combine a complete harpsichord and a complete piano. They are special cases of the combination of a harpsichord and a piano. Evidence for the idea of such a combination, either in written sources or in the form of actual instruments, is dating from 1711 to 1792. These two particular instruments not only each combine a complete harpsichord and a complete piano but allow a single performer to play both on one keyboard at the same time. Nevertheless, the two instruments are different. The 1777 instrument is distinctly German in its conception whereas the 1783 instrument shows the Parisian influence of Pascal Taskin.

The two instruments are compared, not only with each other but also with more instruments by Stein and his contemporaries. This comparison provides indications for changes in the attitude of Johann Andreas Stein in the period reaching back to 1769 and forward to 1783 and by implication the shift, at least in the German-speaking world, in the general musical attitude to stringed keyboard instruments that gradually took place over those years. During this same period and in the same world Stein was certainly regarded as one of the most important stringed keyboard instrument maker of his time. Mozart shared this point of view.

Résumé

Dans cette communication, les deux instruments de Johann Andreas Stein appelés vis-à-vis sont décrits et placés dans leur contexte du XVIII[e] siècle. Ce sont des cas spéciaux qui combinent un clavecin et un piano. L'un d'eux, celui de 1777, appartient à la collection du Musée de Castelvecchio de Vérone, l'autre datant de 1783, se trouve dans la collection du Conservatoire de Musique de San Pietro à Majella, à Naples.

L'évidence de l'idée d'une telle combinaison se trouve soit dans des sources écrites ou sous forme d'instruments existants, datant de 1711 à 1792. Ces deux instruments particuliers ne combinent pas seulement chacun un clavecin complet et un piano complet mais permettent à un seul interprète de jouer les deux en même temps sur un clavier. Néanmoins les deux instruments sont différents. L'instrument de 1777 est incontestablement allemand dans sa conception tandis que celui de 1783 révèle l'influence parisienne de Pascal Taskin. Les deux instruments sont comparés, non seulement l'un par rapport à l'autre, mais aussi par rapport à d'autres instruments de Stein et de ses contemporains. Cette comparaison fournit des indications concernant les changements d'attitudes de Johann Andreas Stein dans la période remontant à 1769 et s'étendant jusqu'en 1783 et par l'implication, du moins dans le monde de langue germanique, du changement de l'attitude musicale générale qui s'installa progressivement pendant ces années envers les instruments à claviers à cordes. Pendant cette même période et dans le même monde, Stein était assurément considéré comme un des plus importants facteurs d'instrument à clavier à cordes de son temps. Mozart partageait ce point de vue.