A handwritten signature in cursive script, appearing to read "J. H. Ewen". The signature is written in dark ink and is positioned at the top center of the page.

CYNTHIA A. HOOVER

DIVISION OF MUSICAL INSTRUMENTS

NATIONAL MUSEUM OF HISTORY AND TECHNOLOGY

*Harpsichords and Clavichords*

SMITHSONIAN INSTITUTION PRESS

CITY OF WASHINGTON

1969

*Cover: Virginal by Giovanni Battista Boni, 1617 (see pages 22–25)*

*Photo: Robert Lautman*

*For sale by the Superintendent of Documents, U.S. Government Printing Office*

*Washington, D.C. 20402 Price 40 cents*

# *Harpsichords and Clavichords*

The harpsichord and the clavichord represent the two most important types of stringed keyboard instruments used from the 15th through the 18th centuries. By the 19th century, the piano had become the most important domestic keyboard instrument.

In this booklet are described a few of the restored Smithsonian harpsichords and clavichords that are occasionally on exhibit in the Hall of Musical Instruments or in use in the series of concerts sponsored by the Division of Musical Instruments. Models showing how the sound is produced on these instruments are also on exhibit.

A complete list of the keyboard collection is found in *A Checklist of Keyboard Instruments at the Smithsonian Institution* (Washington, 1967), which is available from the Division of Musical Instruments, Smithsonian Institution, Washington, D.C. 20560.

# Harpsichords

The harpsichord and its smaller relatives, the virginal and the spinet, have strings that are *plucked*. The harpsichord is wing-shaped, most virginals and spinets are either rectangular or polygonal.

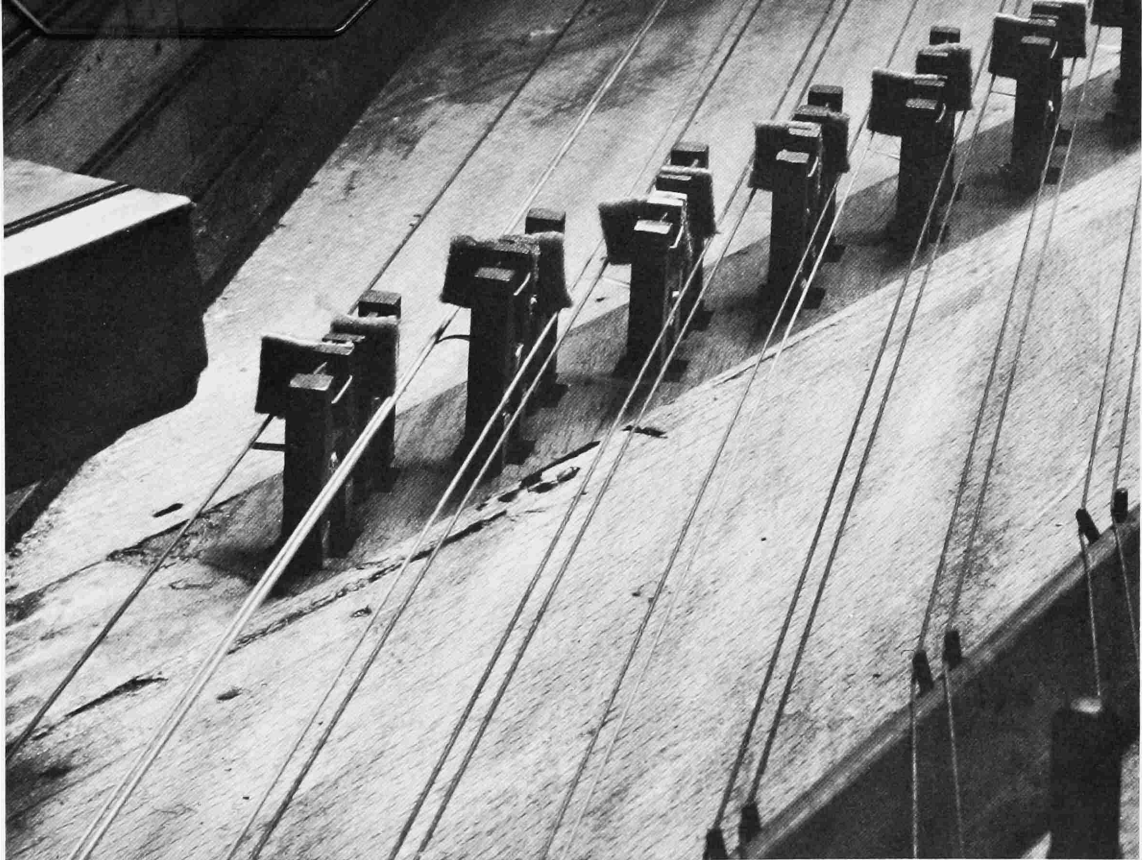
When the harpsichord key is pressed, a wooden jack is raised so that a quill or leather plectrum inserted into the jack tongue plucks the string. When the key is released, the jack falls back into place, the pivoted tongue allowing the plectrum to pass the string without plucking it. A felt damper (inserted in a slit at the top of the jack) touches the string to stop the sound.

Figure 1 shows the jack arrangement in an 18th century English spinet. The second jack from the left on the front row has been raised so that its quill is just about to pluck the string. Note that the quill has lifted the string above its rest position.

Inherent in the design of a harpsichord is the limitation of dynamic nuance. The sound of a harpsichord is not greatly altered by increasing or lessening the impact of fingers on the keys. Rather, the dynamic level and quality of sound can be changed by varying the number of strings plucked (many harpsichords have three sets of strings: two sets tuned in unison [8'] and a third tuned an octave higher [4']), by varying the location of the plucking point, and by muting the strings with felt or leather pads.

The tone of a keyboard instrument is also affected by its general outline, the material and thickness of the soundboard,





1. Harpsichord action. *Photo: Robert Lautman.*

the length and material of the strings, and the type of case construction. The case must be strong enough to counteract the tension of the strings and yet light enough to allow the sound to resonate.

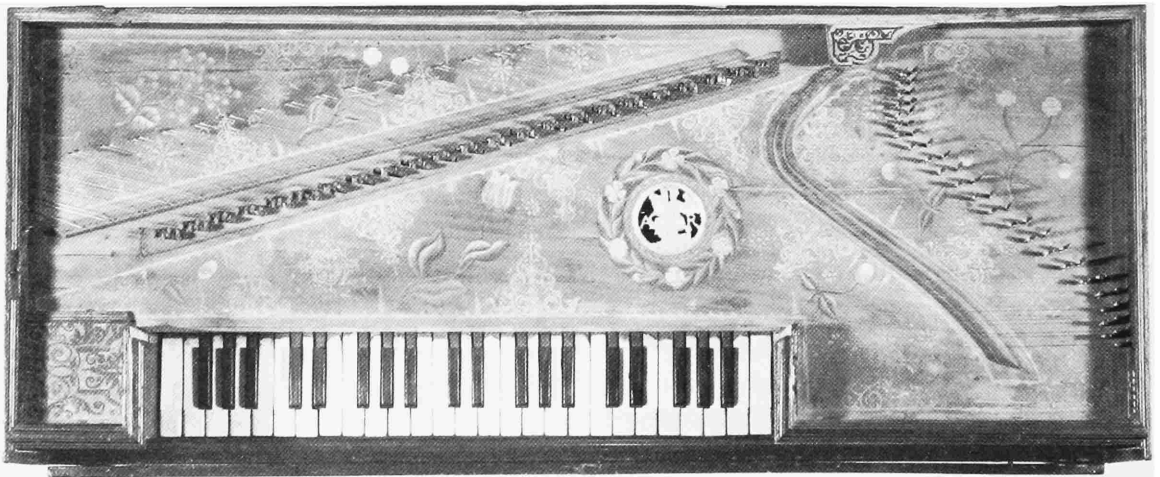
Among the Smithsonian's extensive keyboard collection are fine examples of harpsichords that represent several of the major national trends in harpsichord building: the Flemish, Italian, English, and French.

## *Flemish Harpsichords*

Antwerp was the harpsichord-making center of northern Europe during the 16th and 17th centuries. The earliest examples of harpsichords had only one keyboard and one or two sets of 8' strings. The progressive Flemish makers added a second keyboard and another set of strings, tuned an octave higher than the others, which allowed a wider range in pitch and more variety in sound. Later French and English harpsichords were largely derived from the Flemish style.

*Virginal, 1620; made by Andreas Ruckers, Antwerp  
One manual; Range C/E-c<sup>3</sup> (apparent); 1x8'*

Instruments built by the famous Ruckers family were and are still highly prized. Although simply painted on the exterior, the case of this virginal is decorated on the inside in characteristic Ruckers style. Block-printed papers cover the interior



2. Ruckers virginal: Plan view.



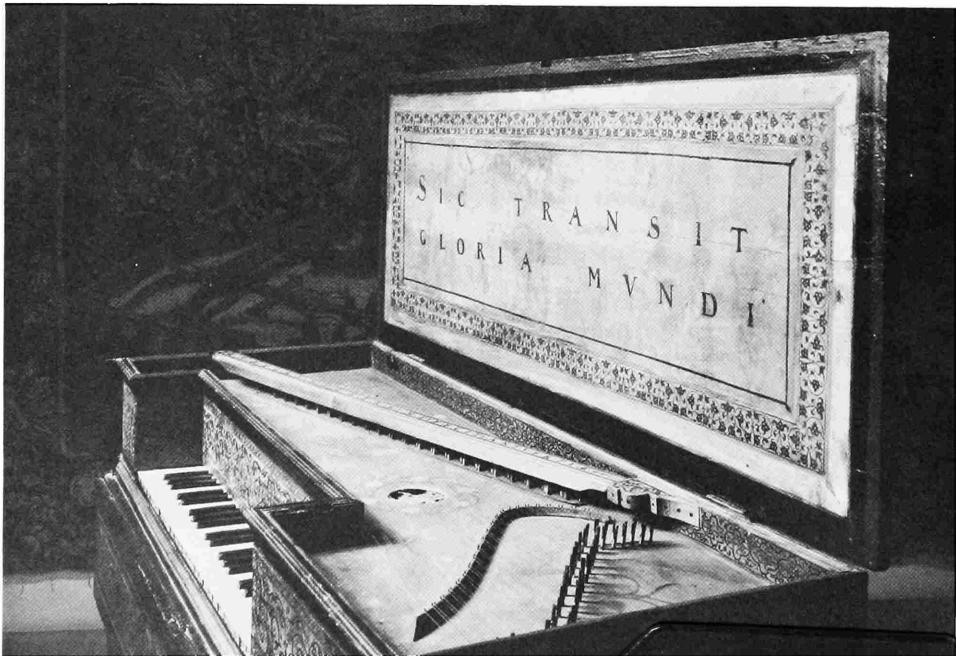
3. Ruckers virginal: Full view.



Ruckers virginal:

4. Detail of keyboard. 5. View of soundboard and lid.

*Photos: Robert Lautman*



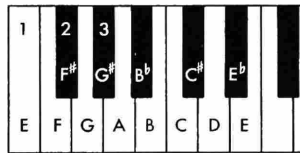
of the case; the inside of the lid bears a Latin motto and the soundboard is painted with flowers and arabesques. Figure 4 illustrates a detail of the block printing, and of the keys. The arcades on the end of the keys appear to be cut from several layers of leather which were then applied to the key fronts.

This instrument is tuned a fourth higher than it might appear. When the C key is pressed, the note sounded is F, a fourth above.

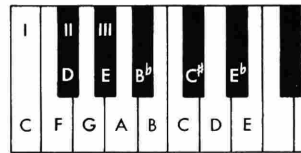
### *Short-Octave Tuning*

Since chromatic notes in the lowest octave of the keyboard were not often needed in the music of the 16th and 17th centuries, the practice of short-octave tuning was adopted.

Although the lowest note on a short-octave instrument appears to be E, the range was actually extended down to C. (The notation C/E indicates this arrangement.)



NORMAL TUNING



SHORT-OCTAVE TUNING

A typical short-octave instrument of the 16th and 17th centuries would be tuned in the following manner: E (1) is tuned down to C (I); F# (2) tuned to D (II); and G# (3) tuned to E (III).

Harpsichord, 1745; made by *Johann Daniel Dulcken, Antwerp*  
*Two manuals; Range FF-f<sup>3</sup>; 2x8', 1x4', lute*

Typical of northern European instruments, the Dulcken harpsichord has a heavy case, two keyboards or manuals, and two 8' choirs and one 4' choir. It also has a lute stop, whose jacks, very close to the nut, pluck one set of unison strings to produce a pungent, nasal tone.



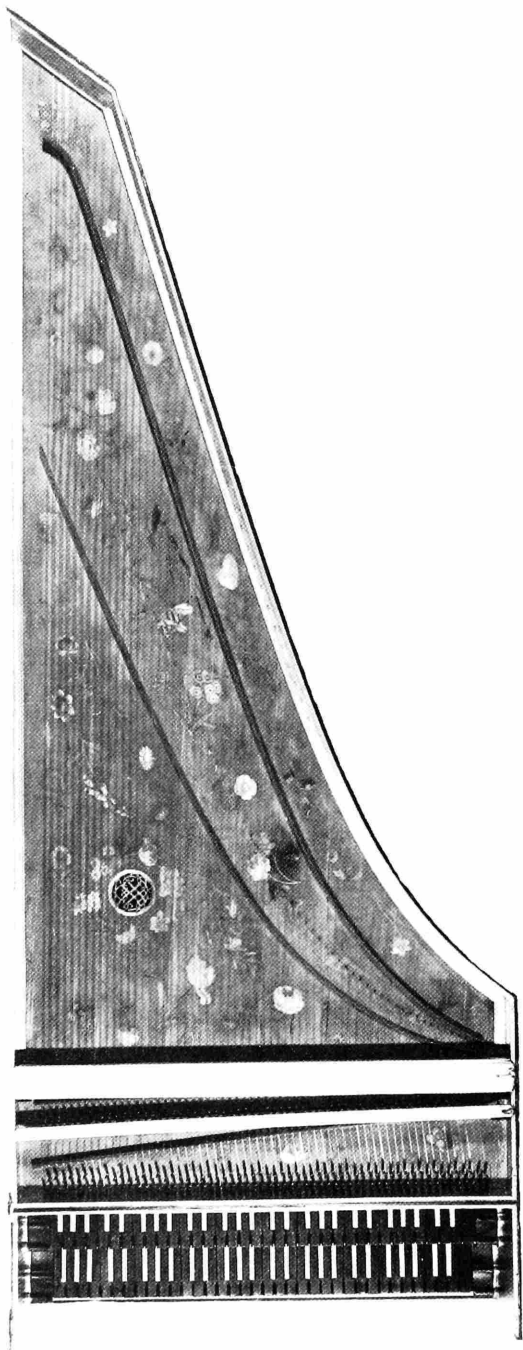
Dulcken harpsichord: 6. *above* Full view.

7. *right* Front view. *Photo: Robert Lautman.*





JOANNES DANIEL DULCEN ME FECIT ANTWERPIA AO 1725



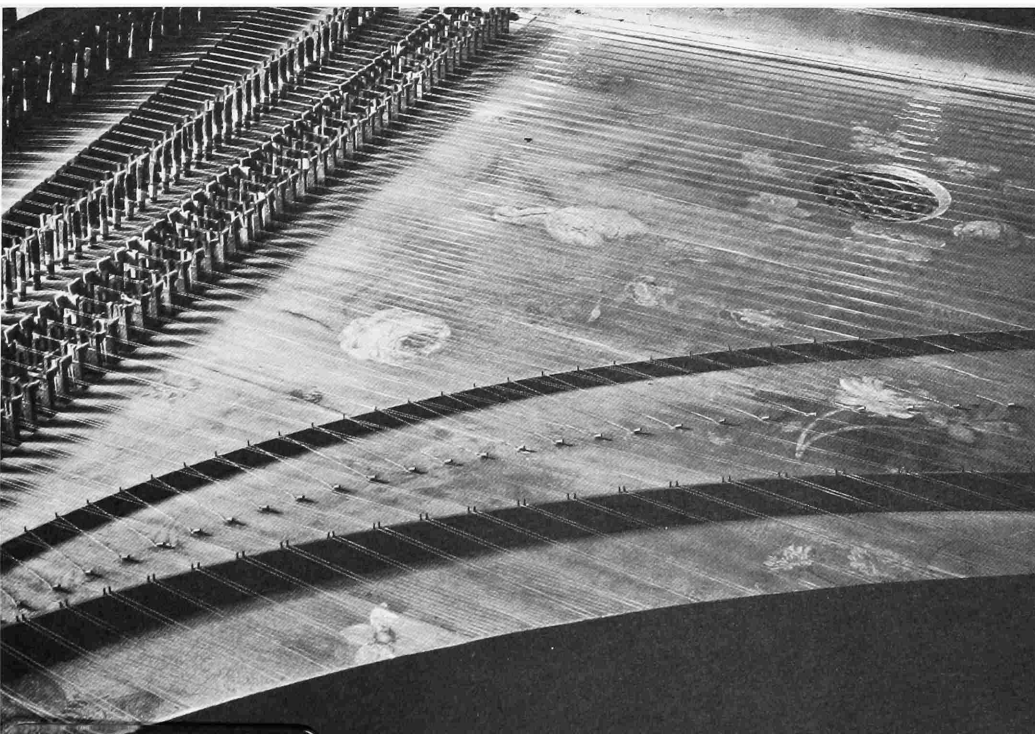
8. Dulcken harpsichord: Plan view.





Dulcken harpsichord: 9. *above* Detail of keyboards. 10. *below* Detail of soundboard.

*Photos: Robert Lautman*



## *Italian Harpsichords*

Typical Italian harpsichords had two choirs of unison strings and two jacks for each key. They were of much lighter construction than those made in northern Europe—the sides of the case were only about an eighth of an inch thick. These fragile instruments were usually placed in heavier, often elaborately decorated, outer cases from which the harpsichord could be removed.

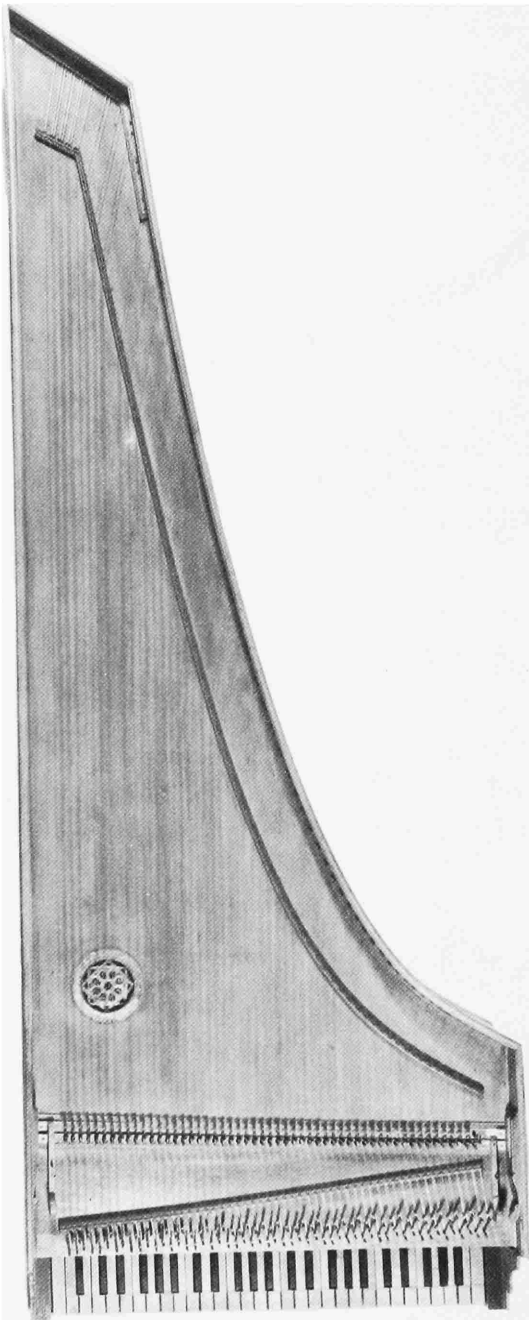
Harpsichord, 1693; maker unknown, Italy  
One manual; Range GG-c<sup>3</sup> (no GG<sup>#</sup>); 2x8'

The typical construction of Italian harpsichords can be seen in this large Italian instrument. The original nameboard is missing; however, as was common practice, the maker marked the date on the tail of the lowest and highest keys.

The Italian harpsichord serves as an ideal *basso continuo* keyboard instrument because it blends well in instrumental combinations. Its clean, crisp sound also allows individual lines to emerge clearly from a polyphonic musical texture.



11. Italian harpsichord (1693): Full view of instrument in outer case.



Italian harpsichord (1693):

12. Plan view

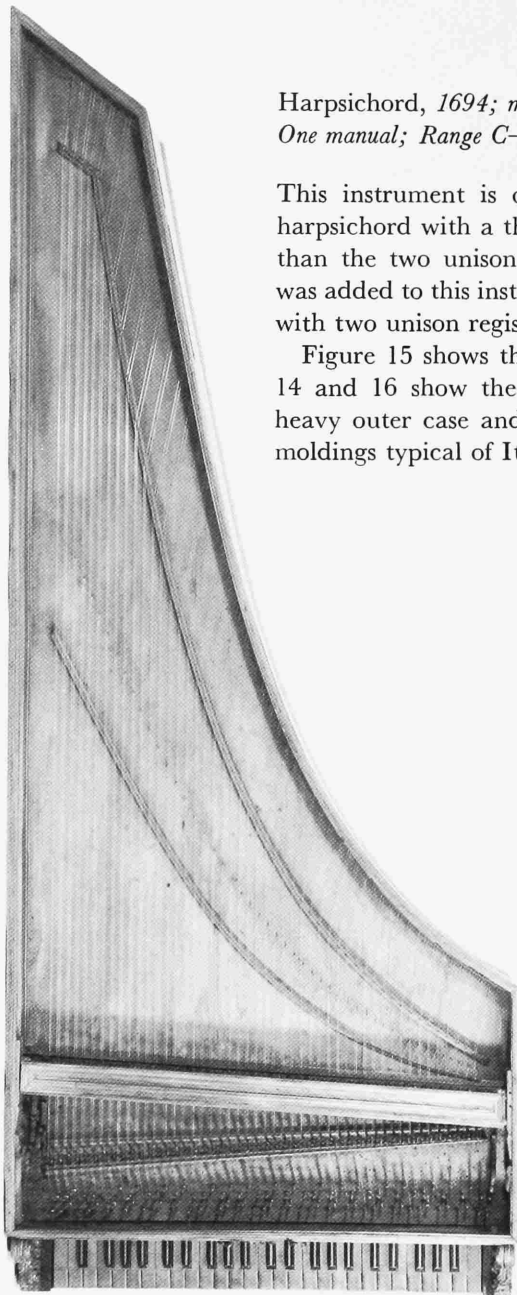
13. Detail of keyboard. *Photo: Robert Lautman.*



*Harpsichord, 1694; made by Nicolaus DeQuoco, Italy  
One manual; Range C-c<sup>3</sup> (no C<sup>#</sup>); 2x8', 1x4'*

This instrument is one of the few examples of an Italian harpsichord with a third set of strings tuned an octave higher than the two unison choirs. It is possible that the third set was added to this instrument sometime after it was constructed with two unison registers.

Figure 15 shows the instrument before restoration; Figures 14 and 16 show the restored harpsichord removed from its heavy outer case and details of the handsome keyboard and moldings typical of Italian instruments.

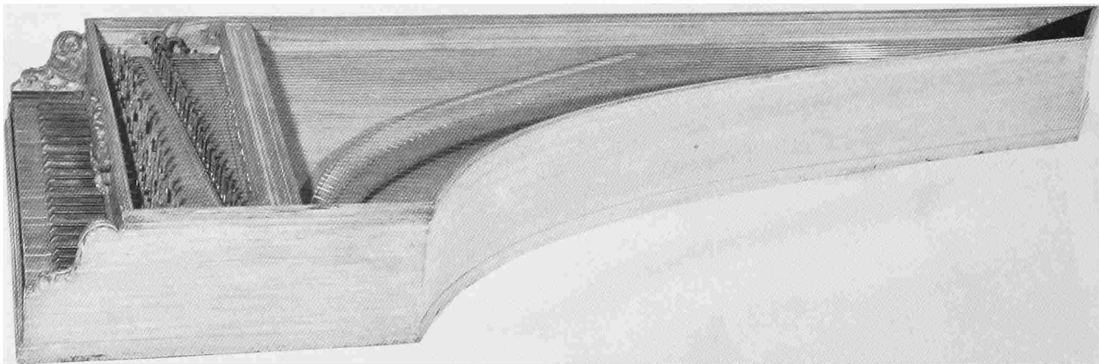


14. DeQuoco harpsichord: Plan view.



15. DeQuocco harpsichord: Full view of instrument in outer case.





DeQuoco harpsichord:

16. *above* View of instrument removed from outer case.

17. *below* Inscription on wright plank.

18. *right* Detail of keyboard. *Photo: Robert Lautman.*



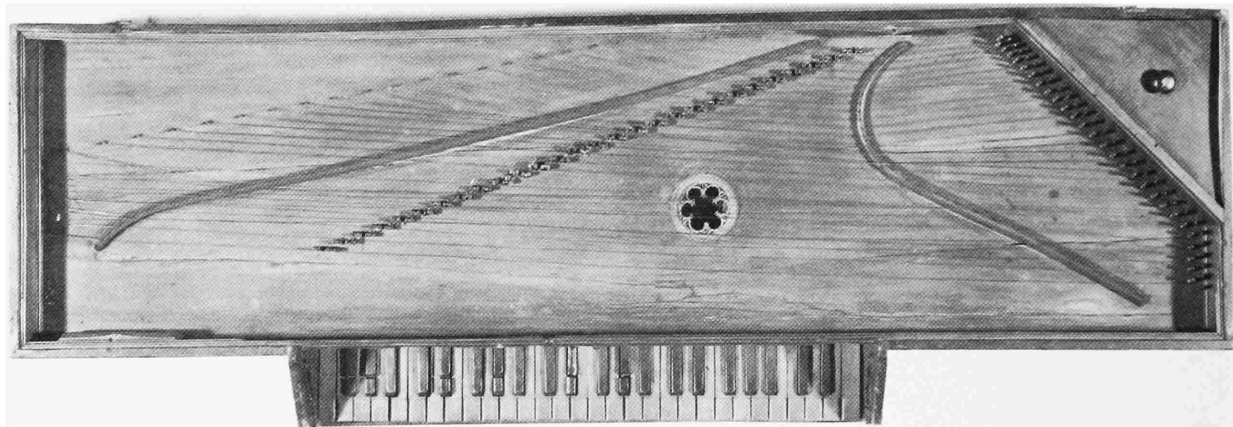








19. Boni virginal: Full view.



Boni virginal: 20. Plan view. 21. View of keyboard. *Photo: Robert Lautman.*



## *English Harpsichords*

In the 18th century, London became a center of harpsichord making. The two most important makers, Jacob Kirckman and Burkat Shudi, were Swiss immigrants who first apprenticed with Hermann Tabel, a Flemish harpsichord maker who had also emigrated to England. In America, where English culture was highly regarded, Thomas Jefferson owned a Kirckman harpsichord, Francis Hopkinson a Shudi and Broadwood.

The heavy cases of the typical English instruments were veneered in walnut, mahogany, and later satinwood, and rested on trestle stands. The usual range was five octaves: FF-f<sup>3</sup> for harpsichords; GG-g<sup>3</sup> for spinets (and organs). In general, the sound produced on an English harpsichord is more thick and lush than the sound of instruments from other European centers.

*Spinet, about 1710; made by Thomas Hitchcock, London  
One manual; Range GG-g<sup>3</sup>; 1x8'*

The spinet, a member of the harpsichord family, was a popular domestic keyboard instrument in England and America during the 18th century and was mentioned in many American diaries and inventories of that time. The spinet often served as the keyboard instrument for the household that could not afford or did not have room for the harpsichord or organ.

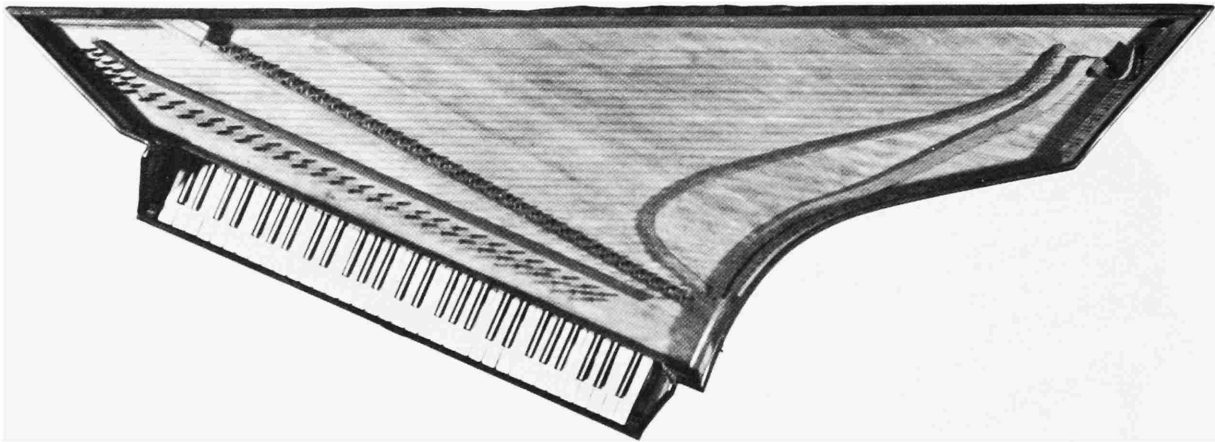
The Hitchcock family supplied many spinets for early 18th-century gentility. Note in Figure 24 the handsome brass hinges, one of many examples of the beautiful hardware used by English builders. This instrument is quilled with crow quill, the most common material used for plectra at that time. A detail of the jacks and stringing is shown in Figure 1.



Thomas Hitchcock London fecit N° 287.

22. Hitchcock spinet: Full view and nameboard.





Hitchcock spinet: 23. Plan view. 24. Top view. *Photo: Robert Lautman.*



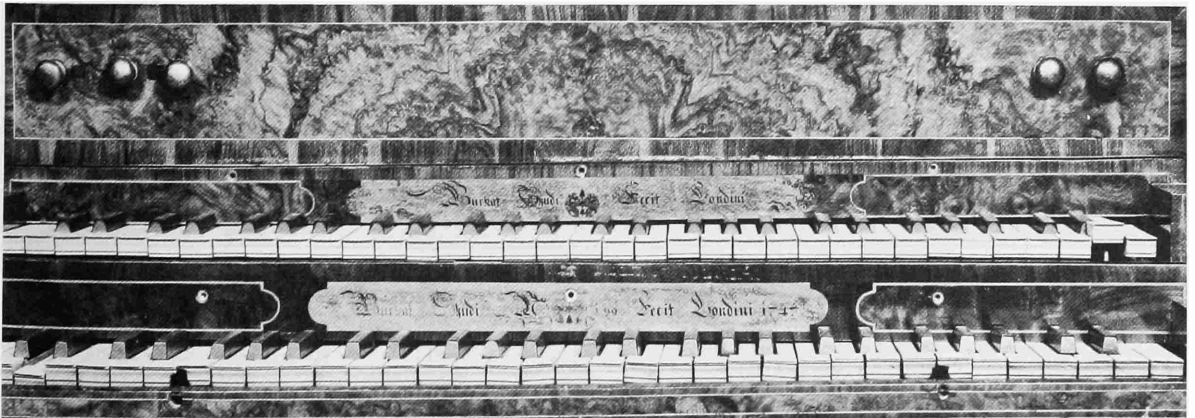


Harpsichord, about 1743; made by Burkat Shudi, London  
Two manuals; Range FF-f<sup>3</sup> (no FF#); 2x8', 1x4', lute, buff

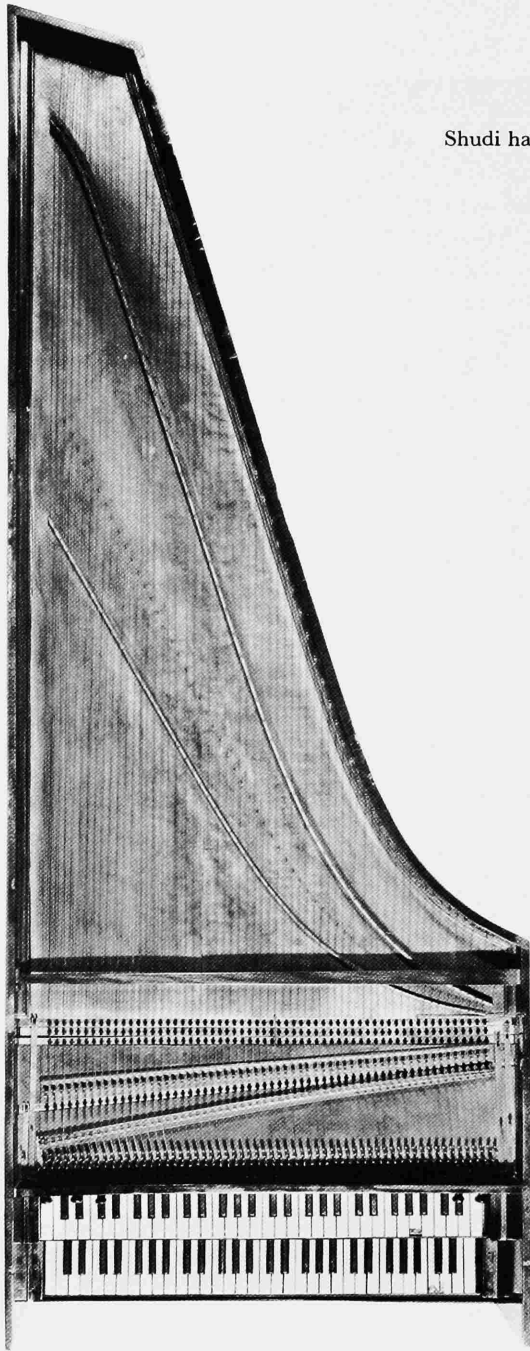
Most of the stops on early harpsichords were changed by hand. From left to right, the stop knobs shown in Figure 25 operate the following registers: *lute*, *octave* (4'), *buff* (muting the second unison by pressing soft leather pads against the strings), *first unison* (8'), and *second unison* (8'). The lute stop plays from the upper manual, the first unison from both manuals, and the remaining stops from the lower manual.

Figures 25 and 26 show the instrument before restoration. The name batten on which the date of 1747 appears is not original to the instrument. The date of the instrument is based on the serial number 144 stamped on the lower keyboard. From all records it appears Shudi would have built an instrument with that serial number in 1743.

25. Shudi harpsichord: View of keyboards.



Shudi harpsichord: 26. Plan view. 27. Full view.





## *French Harpsichords*

Although Paris claimed many harpsichord builders, few French harpsichords remain today. Many were destroyed at the time of the Revolution and later when firewood was needed to heat Conservatoire classrooms.

French builders, the most famous among them the Blanchet family and Pascal Taskin, spent much of their time reconstructing Ruckers harpsichords to satisfy the musical and decorative tastes of 18th-century France. Included in this reconstruction or *ravalement* were the extension of compass (usually from C–c<sup>3</sup> to FF–f<sup>3</sup>), enlargement of the case and soundboard, and often replacement of keyboards, jacks, and registers.

Housed in elegantly painted cases supported by cabriole or fluted legs, typical French harpsichords had two manuals and were praised for their lightness of touch. Later 18th-century developments included a fourth register called *peau de buffle* (plectra of soft chamois-type leather) and knee levers to operate the registers.

Harpsichord, 1760; made by *Benoist Stehlin, Paris*  
*Two manuals; Range FF–f<sup>3</sup>; 2x8', 1x4', buff, shove coupler*

In recent years the Smithsonian was fortunate to acquire one of the few remaining French harpsichords. The builder's name is known from the design on the soundboard rose which includes the initials "B" and "S"; also, the name "Benoist Stehlin" is inscribed on two of the jacks. The 1760 date is painted on the left side of the soundboard. An inventory of Stehlin's workshop and house made at the time of his death in 1774 lists a Ruckers harpsichord altered by Stehlin along with several other instruments in various stages of completion. Figures 28 and 30 show the instrument before its restoration.



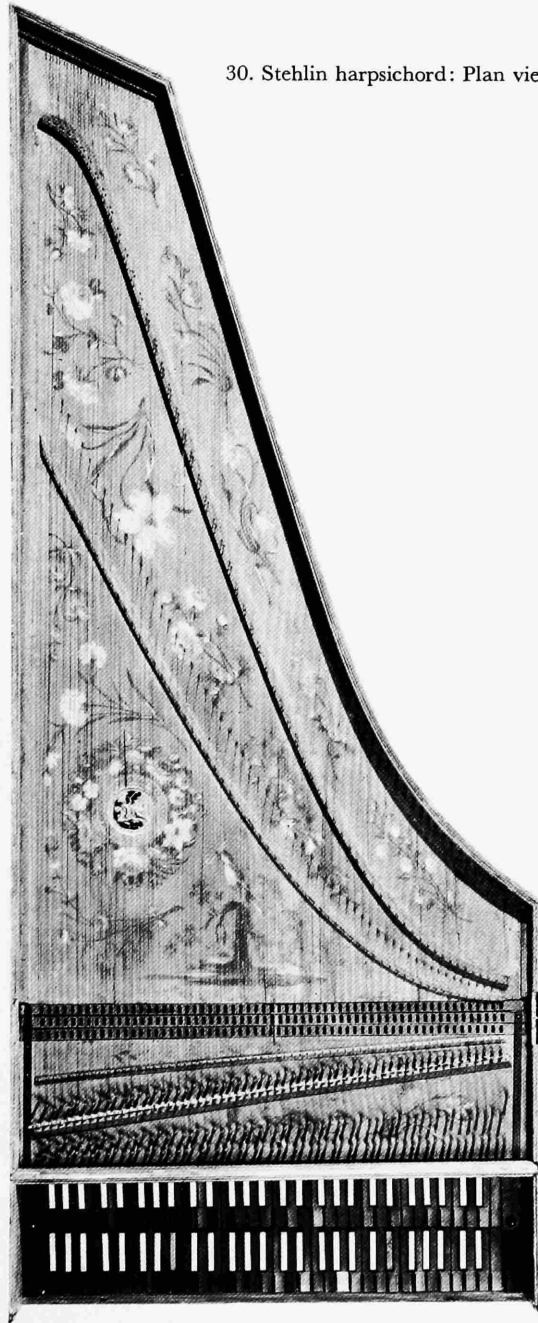
28. Stehlin harpsichord: Full view.

This instrument was restored to playing condition in the conservation laboratory of the Division of Musical Instruments in 1968. Typical of most French instruments, it is equipped with a shove coupler, which enables the player to operate both manuals from the lower keyboard by shoving the upper keyboard away from him. In this pushed-back position, wooden uprights (dogs) attached to the upper surface of the far ends of the lower key levers couple the two manuals and cause the upper manual keys to descend when the lower manual keys are pressed.

29. Stehlin harpsichord: Detail of rose.



30. Stehlin harpsichord: Plan view.



# Clavichords

Dynamic shadings are possible in the clavichord, as in the piano, through variation of finger pressure. In both, the strings are struck—by metal tangents in the clavichord and by leather or felt hammers in the piano.

In the clavichord the strings extend over a soundboard bridge on the player's right and are damped (stopped from vibrating) by strips of cloth on the left. The metal hammer (tangent) mounted in the end of the key strikes the string and continues to touch it as long as the player presses the key. The tangent, while touching the string, divides it into two segments—the segment on the right being free to vibrate, the segment on the left being damped by the cloth. When the key is released, the cloth damps the entire string.

Figure 31 shows a player depressing a clavichord key (middle c). The tangent at the far end of the key lever has been raised so that it has struck the strings and has lifted them above rest position. The damping cloth on the left of this raised string can also be seen.

Known as early as the 15th century, the clavichord produces tones, though limited in volume, that are very expressive and even capable of vibrato (*Bebung*). Because it lacks carrying power, the clavichord historically was a solo or practice instrument, for it could not be heard in combination with other instruments or with the voice.





31. Clavichord action. *Photo: Robert Lautman.*

Fretted Clavichord, *about 1700; maker unknown, Germany*

Unfretted Clavichord, *18th century; maker unknown, Germany*

The clavichord was usually housed in a rectangular case which rested upon a simple stand. The range of the earlier instruments was about four octaves. By the 18th century the range had been expanded to five octaves.

The larger, later clavichords had separate strings for each key and were unfretted or *bundfrei*. Many smaller and earlier clavichords were fretted (*gebunden*), having some strings that would produce more than one pitch when struck at different points by adjacent keys.

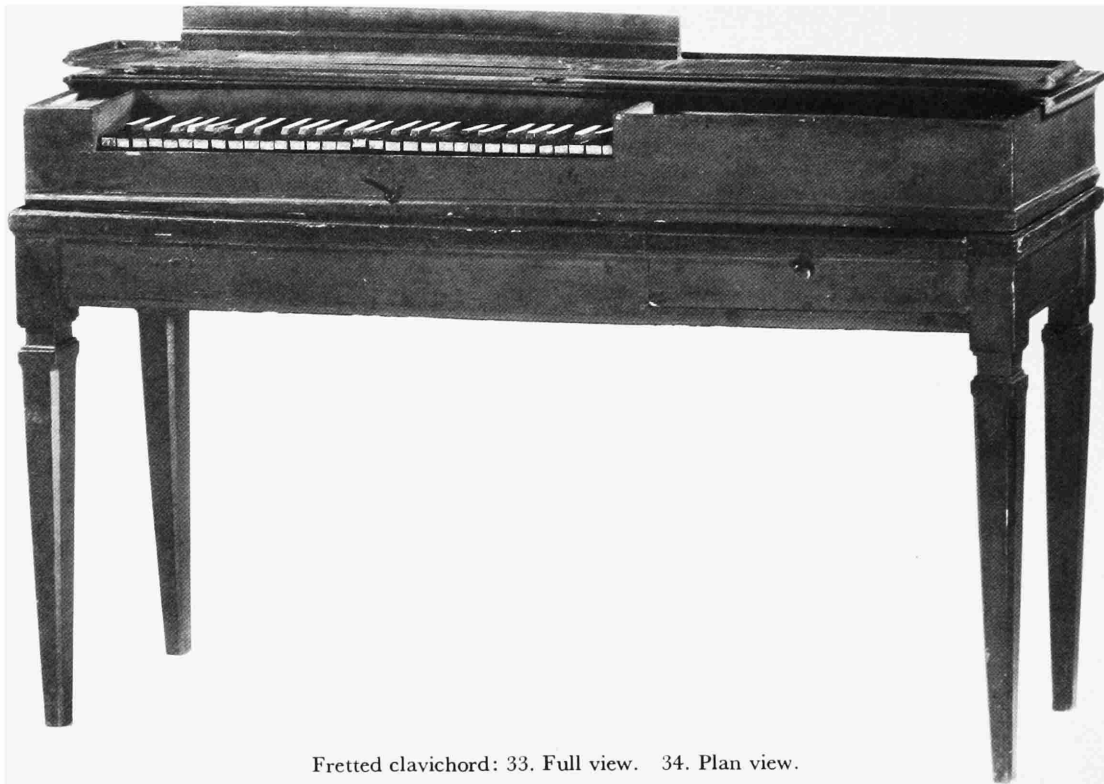
Figure 32 shows the fretted clavichord keyboard in more detail. Tangents on keys numbered 16 and 17 strike the same strings to produce the notes  $e^b$  and  $e$ . Some other fretted notes shown in the picture include: keys 18 and 19 ( $f$  and  $f^\sharp$ ), keys 20 and 21 ( $g$  and  $g^\sharp$ ), keys 23 and 24 ( $b^b$  and  $b$ ), and keys 25 and 26 (middle  $c$  and  $c^\sharp$ ). Figure 31 is also a detail from this clavichord.

The Smithsonian clavichord shown in Figures 35 and 36, in unrestored condition, is typical of the large unfretted instruments that became standard in Germany by the mid-18th century and for which Carl Philipp Emanuel Bach wrote many solo keyboard compositions.

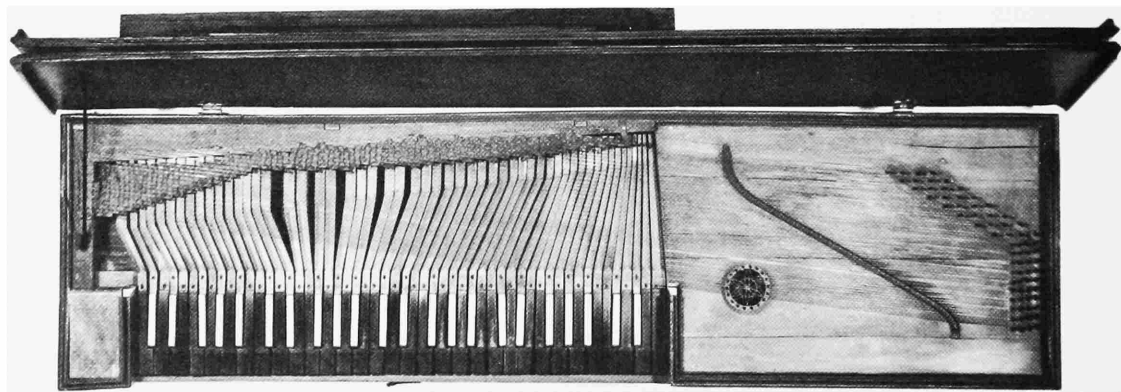
32. Fretted clavichord: Detail of fretting.

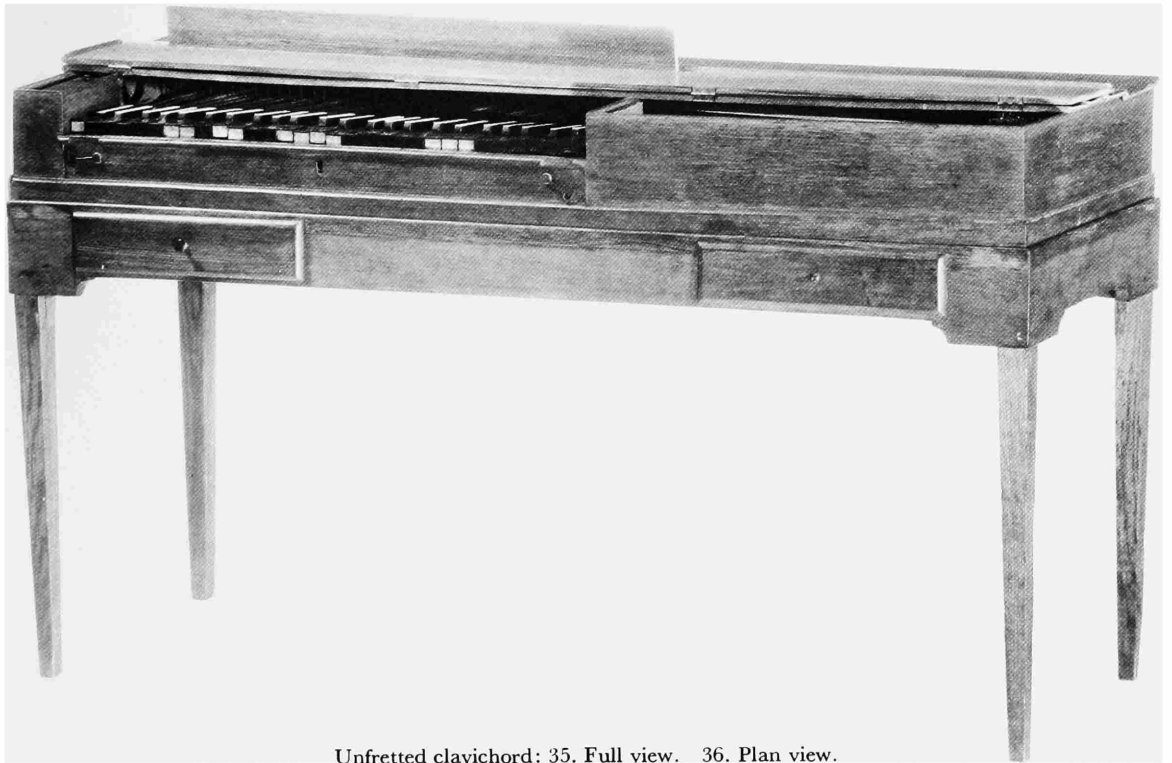
*Photo: Robert Lautman.*



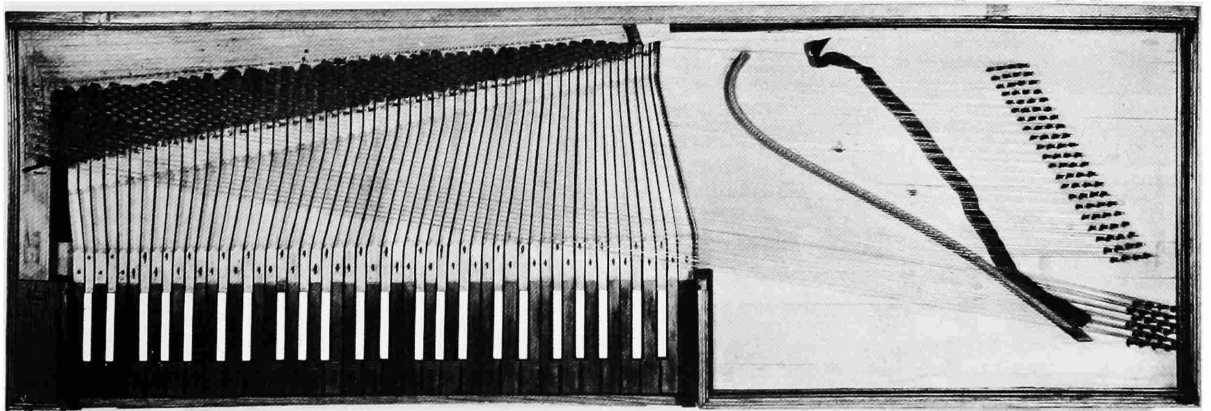


Fretted clavichord: 33. Full view. 34. Plan view.





Unfretted clavichord: 35. Full view. 36. Plan view.



By the beginning of the 18th century the desire was strong for a more expressive keyboard instrument to use in ensembles. Harpsichord builders added new stops, devised special leather plectra, and added Venetian swell effects and other innovations to alter the sound of the harpsichord. But no matter what they did, they could not produce enough dynamic gradation to satisfy musical taste. The clavichord was capable of dynamic nuance, but it lacked carrying power.

Instrument builders, seeking to satisfy the demands created by the change in sensibility and musical taste, turned naturally to the domestic instruments they knew best—the harpsichord and clavichord—as the process of adaptation began. For this reason, as the pianoforte was developed and perfected, the general proportions and arrangement of the grand piano resembled those of the harpsichord. Similarly, the relation between the keyboard and strings, the scaling, and other features of the square piano resembled those of the clavichord.

By the beginning of the 19th century the pianoforte, an instrument capable of subtle changes between soft and loud, had become the most important domestic and concert keyboard instrument. After 1800 few clavichords or harpsichords were built or used until they were revived by early music enthusiasts at the end of the 19th century.

## *Selected Bibliography*

- BOALCH, DONALD. *Makers of the Harpsichord and Clavichord*.  
London: George Ronald, 1955.
- HIRT, FRANZ JOSEF. *Meisterwerke des Klavierbaus*.  
Olten, Switzerland: Urs Graf-Verlag, 1955.
- HUBBARD, FRANK. *Harpsichord Regulating and Repairing*.  
Boston: Tuner's Supply, Inc., 1963.
- HUBBARD, FRANK. *Three Centuries of Harpsichord Making*.  
Cambridge, Massachusetts: Harvard University Press, 1965.
- JAMES, PHILIP. *Early Keyboard Instruments*.  
London: Peter Davies, 1930.
- RIPIN, EDWIN M. "The Early Clavichord," *Musical Quarterly*,  
53(4) (October 1967): 518-538.
- RUSSELL, RAYMOND. *The Harpsichord and the Clavichord*.  
London: Faber and Faber, 1959.
- SHORTRIDGE, JOHN D. "Italian Harpsichord-Building in the  
16th and 17th Centuries." *United States National Museum  
Bulletin*, 225 (15): 93-107, 1960.

U.S. GOVERNMENT PRINTING OFFICE: 1969 O-356-589