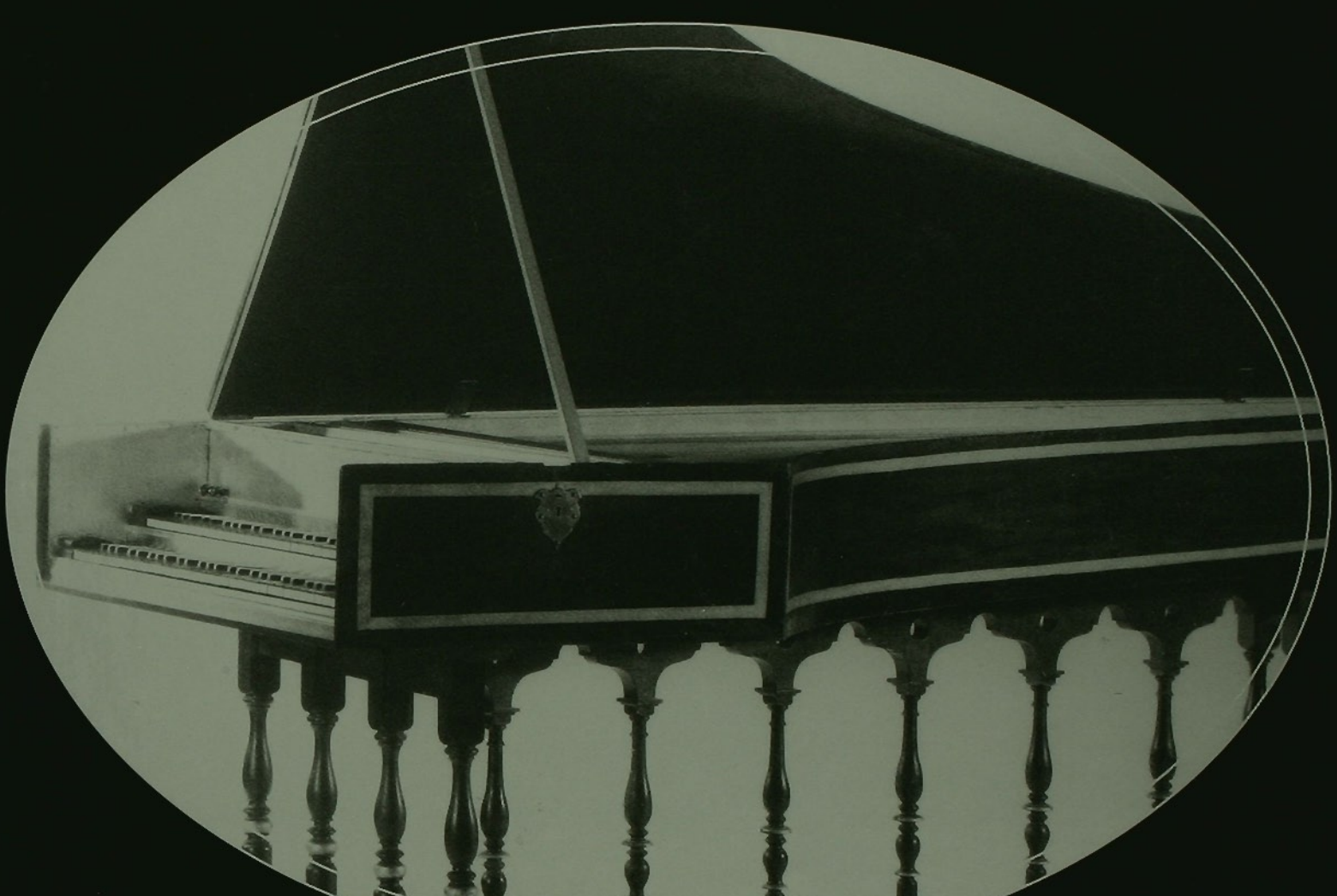
ENCYCLOPEDIA OF KEYBOARD INSTRUMENTS



The Harpsichord and Clavichord

AN ENCYCLOPEDIA

EDITED BY
IGOR KIPNIS

The Harpsichord and Clavichord

AN ENCYCLOPEDIA

Encyclopedia of Keyboard Instruments
ROBERT PALMIERI, Series Editor

Piano, Second Edition
ROBERT PALMIERI, Editor
MARGARET W. PALMIERI, Associate Editor

Harsichord and Clavichord
IGOR KIPNIS, Editor

Organ
DOUGLAS E. BUSH, Editor

The Harpsichord and Clavichord

AN ENCYCLOPEDIA

Igor Kipnis, Editor

Routledge
Taylor & Francis Group
New York London

Routledge is an imprint of the
Taylor & Francis Group, an informa business

Routledge
Taylor & Francis Group
270 Madison Avenue
New York, NY 10016

Routledge
Taylor & Francis Group
2 Park Square
Milton Park, Abingdon
Oxon OX14 4RN

Routledge is an imprint of Taylor & Francis Group, an Informa business

Printed in the United States of America on acid-free paper
10 9 8 7 6 5 4 3 2 1

International Standard Book Number-10: 0-415-93765-5 (Hardcover)
International Standard Book Number-13: 978-0-415-93765-8 (Hardcover)

Library of Congress Cataloging-in-Publication Data

Harpsichord and clavichord : an encyclopedia / Igor Kipnis, editor.
p. cm. -- (Encyclopedia of keyboard instruments)
Includes bibliographical references and index.
ISBN 0-415-93765-5 (hb)
1. Harpsichord--Encyclopedias. 2. Clavichord--Encyclopedias. I. Kipnis, Igor. II. Series: Encyclopedia of keyboard instruments (Routledge (Firm))

ML102.H385H37 2006
786.303--dc22 2006004800

Visit the Taylor & Francis Web site at
http://www.taylorandfrancis.com

and the Routledge Web site at
http://www.routledge-ny.com

Contents

Foreword vii
Editor's Note xiii
List of Illustrations xv
Abbreviations and Pitch Symbols xix
Common Reference Sources xxi
The Encyclopedia 1
Contributors 527
Index 539

Foreword

The subject of music and its systemization has long been a subject of fascination to those whom we now call lexicographers. It began long ago, in the classical world of the Greeks and Romans, as well as the subsequent Middle Ages. The creation of music dictionaries and encyclopedias per se, with more methodical compilations of terms and musical subjects, commenced—tentatively, at first—with Johannes Tinctoris's *Terminorum musicae diffinitorium* of 1495, a tome explicating just slightly under three hundred terms, and that of Henri Arnaut de Zwolle (mid-fifteenth century). In chronological order, there next appeared noteworthy treatises by Sebastian Virdung (1511), Michael Praetorius (1619), Marin Mersenne (1636/7), Sebastien de Brossard and Tomas Janovka (both 1701), Johann Gottfried Walther (1732), James Grassineau (1740), Jean-Jacques Rousseau (in the 1749 Diderot *Encyclopédie* and in his own *Dictionaire* in 1768), Jakob Adlung (1768), Sprengel (1778), Heinrich Christoph Koch (1802), Gustav Schilling (1835–38), François Joseph Fétis (1835–42), Moore (1845–46), Eduard Bernsdorf (1856–65), Edward F. Rimbault (1860), Hermann Mendel (1870–79), George Grove (1878–90), Hugo Riemann (1882), Luigi-Francesco Valdrighi (1884), *The New Grove Dictionary of Musical Instruments* (1984), Albert Jacquot (1886), Curt Sachs (1913/1964), Moser (1931), Percy A. Scholes (1938/1970), Thompson (1939/1970), Willi Apel (1944; new version Don Michael Randel 1986), Sohlman (1948–51), *Die Musik in Geschichte und Gegenwart* (1949–79/1994–), Josip Andreis (1958–63), Sibyl Marcuse (1964), Hirt (1955), Donald H. Boalch (1956/1974; rev. Charles Mould 1995), Michel (1958–61), Claudio Sartori (1963/1974), Guido Gatti (1966–71), Marc Honegger (1970–76), Hans Heinrich Eggebrecht (1972), Iurii Vsevolodovich Keldysh (1973), Theo Willemze (1975), Basso (1983), and Denis Arnold (1983).

Today, organological texts abound, whether dealing specifically with stringed keyboard instruments such as Raymond Russell's groundbreaking *Harpsichord and Clavichord* (London: Faber and Faber, 1959; rev. Howard Schott, 1973), Frank Hubbard's highly influential *Three Centuries of Harpsichord Making* (Cambridge, MA: Harvard University Press, 1965), John Koster's long-awaited *Keyboard Musical Instruments in the Museum of Fine Arts, Boston* (Boston: Northeastern University Press, 1994), Bernard Brauchli's *The Clavichord* (Cambridge: University of Cambridge Press, 1998), or such a significant reference book about builders as Charles Mould's revision of the Donald H. Boalch *Makers of the Harpsichord and Clavichord* (3d ed., Oxford: Clarendon Press, 1996).

On the subject of the various types of harpsichords and clavichords, one finds available an enormous number of general surveys and illustrated books of important collections—only a sampling of which are given here, arranged in their chronological order of publication:

Francis W. Galpin, *Old English Instruments of Music* (London: Methuen, 1910; rev. Thurston Dart, 1965)
William Skinner, *The Belle Skinner Collection of Old Musical Instruments* (Holyoke, MA: Belle Skinner, 1933)
Nicholas Bessaraboff, *Ancient European Musical Instruments* (Cambridge, MA: Harvard University Press, 1941)
Franz Josef Hirt, *Stringed Keyboard Instruments 1440–1880* (Olten, Switzerland: Urs Grafs-Verlag, 1955)
Herbert Heyde, *Historische Musikinstrumente im Bachhaus Eisenach* (Eisenach, Germany: Bachhaus Eisenach, 1976)
Hubert Henkel, *Kielinstrumente* (Musikinstrumenten-Museum der Karl-Marx-Universität, Leipzig; Leipzig: VEB Deutscher Verlag für Musik Leipzig, 1979)
John Henry van der Meer, *Musikinstrumente* (Germanischen Nationalmuseums, Nürnberg; Munich: Prestel-Verlag, 1983)
Edwin M. Ripin, ed., *The New Grove Musical Instrument Series: Early Keyboard Instruments* (articles taken from *The New Grove Dictionary of Music and Musicians*; London: Macmillan, 1989)
Claude Mercier-Ythier, *Les Clavecins* (Paris: Éditions Vecteurs, 1990)
John Henry van der Meer, ed., *Kielklaviere—Cembali, Spinette, Virginale* (with articles by John Henry van der Meer, Martin Elste, Günther Wagner, Horst Rase, and Dagmar Droysen-Reber; Berlin: Staatliches Institut für Musikforschung, 1991)
Edward L. Kottick, *The Harpsichord: A Concise History* (Bloomington: Indiana University Press, 2002)

Any survey of other important publications would have to include:

Edwin M. Ripin, ed., *Keyboard Instruments: Studies in Keyboard Organology, 1500–1800* (Edinburgh: Edinburgh University Press, 1971; reprint New York: Dover, 1977)
Hubert Henkel, *Beiträge zum historischen Cembalobau* (Leipzig: VEB Deutscher Verlag, 1979)
Howard Schott, ed., *The Historical Harpsichord* monograph series (New York: Pendragon, 1984–).

And then there are books about prominent builders of the past:

William Dale, *Tschudi the Harpsichord Maker* (London; Constable, 1913; reprint Boston: Longwood, 1978)
Jeannine Lambrecht-Douillez and M-J. Bosschaerts-Eykends, *Andreas Ruckers de oude, Andreas Ruckers de jonge* (Antwerp: Ruckers Genootschap, 1984)
Grant O'Brien, *Ruckers: Harpsichord and Virginal Building Tradition* (Cambridge: Cambridge University Press, 1990)
Jean Tournay, *Archives Dulcken* (Brussels: Musée Instrumental, 1987–)

Many illustrated books and pamphlets, in addition to those above, have been published describing and illustrating the important holdings of many museums; some are slight, while others are more elaborately produced coffee-table displays. These include publications of the Fenton House, the Fitzwilliam Museum, the Benton Fletcher Collection, the Metropolitan Museum of Art, the Smithsonian Institution, the Victoria and Albert Museum, and the Yale University Collection of Musical Instruments, and such private collectors as Andreas Beurmann, Fritz Neumeyer, and Luigi Ferdinando Tagliavini, as well as publications relating to collections housed variously in Antwerp, Bruges, Brussels, Copenhagen, Edinburgh, Hamburg, Lisbon, Paris, Stockholm, Trondheim, Vienna, and Vermillion, South Dakota, among many more cities and sites.

Then, too, there exists an impressive assemblage of twentieth-century instruction books, ranging from at least partially outmoded tutorials and introductions to the instrument, such as:

Cornelia Auerbach, *Die deutsche Clavichordkunst des 18. Jahrhunderts* (Kassel: Bärenreiter-Verlag, 1930/1959)
Max F. Schneider, *Beiträge zu einer Anleitung Clavichord und Cembalo zu spielen* (Strassburg: Heitz & Co.,1934/1974)
Eta Harich-Schneider, *The Harpsichord* (Kassel: Bärenreiter-Verlag, 1954)
Hanns Neupert, *Harpsichord Manual* (Kassel: Bärenreiter-Verlag, 1968)
Hanns Neupert, *The Clavichord* (Kassel: Bärenreiter-Verlag, 1960/1965)

to the more historically informed, such as:

Howard Schott, *Playing the Harpsichord* (New York: St. Martin's, 1971)
Ruth Nurmi, *A Plain and Easy Introduction to the Harpsichord* (Albuquerque: University of New Mexico Press, 1974)
Fernando Valenti, *The Harpsichord: A Dialogue for Beginners* (Hackensack, NJ: Jerona Music, 1982)
Richard Troeger, *Technique and Interpretation on the Harpsichord and Clavichord* (Bloomington: Indiana University Press, 1987)
Ann Bond, *A Guide to the Harpsichord* (Portland, OR: Amadeus, 1997)
Edward L. Kottick, *The Harpsichord Owner's Guide: A Manual for Buyers and Owners* (Chapel Hill: University of North Carolina Press, 1987; not, strictly speaking, a tutorial at all, but an excellent "fix-it" book).

To a greater or lesser extent all of these deal with the instruments under consideration, including such matters as registration.

The majority of harpsichord and clavichord aficionados understandably tend to involve themselves with pre-nineteenth-century matters regarding instruments and repertoire. Since the late-nineteenth- and early-twentieth-century resurrection of the harpsichord, however, there is far more to the story of the instrument than just its somnambulant phasing out near the end of the eighteenth century. The clavichord, of course, lasted somewhat longer, particularly in Scandinavian countries, but its popularity there, too, was to vanish. Thus, within the confines of this encyclopedia will be found some perhaps surprising articles on more contemporary matters. This even includes the use of the harpsichord in nonclassical ways—for example, in jazz and popular music, as well as films. Certain aspects of harpsichord specifications (such as the sometimes maligned 16' register) therefore can reasonably supplement our list of subjects, as well as the inclusion of such reference books as Frances Bedford and Robert Conant, *Twentieth-Century Harpsichord Music: A Classified Catalog* (Hackensack, NJ: Joseph Boonin, 1974), and the far more expanded Francis Bedford, *Harpsichord and Clavichord Music of the Twentieth Century* (Berkeley, CA: Fallen Leaf, 1993), as well as books concerning the revival of historical keyboard instruments, such as Wolfgang Joachim Zuckermann, *The Modern Harpsichord: Twentieth Century Instruments and Their Makers* (New York: October House, 1969), John Paul, *Modern Harpsichord Makers* (London: Gollancz, 1981), and Larry Palmer: *The Harpsichord in America* (Bloomington: Indiana University Press, 1989).

Articles on organology have proliferated in many *Festschrifte* (books of essays in honor of important scholars' significant birthdates) and in the periodicals, newsletters, magazines, and tracts of various organizations:

Acta Musica
American Musical Instrument Society Newsletter
AMIS, the Journal of the American Musical Instrument Society
Analecta musicologica
Bach Perspectives

Boston Clavichord Society Newsletter
Continuo (now defunct)
Clavichord International
De Clavicordio, the proceedings of the International Clavichord Symposium
the Deutsche Clavichord Societät
the Dolmetsch Foundation
Early Keyboard Journal, published by the Southeastern Historical Keyboard Society and the Midwestern Historical Keyboard Society
Early Keyboard Studies Newsletter
Early Music
Early Music America
English Harpsichord and Fortepiano Magazine (originally *Harpsichord Magazine*, subsequently *English Harpsichord Magazine*)
Galpin Society Journal
Harpsichord (now defunct)
Das MusikInstrument
Organ Yearbook
San Diego Harpsichord Society Newsletter

Since the contemporary world of communication has grown so prodigiously, it is also necessary and helpful for early keyboard aficionados to mention the several Internet websites devoted to the relevant instruments, even though their existence in some cases may be ephemeral.

Keyboard Society Websites

Galpin Society (http://www.music.ed.ac.uk/euchmi/galpin/)
Midwestern Historical Keyboard Society (http://www.mhks.org/)
Southeastern Historical Keyboard Society (http://www.sehks.org/)
Waterloo Early Keyboard Society (weks-1@wlu.ca)

Harpsichord Websites

Harpsichords and Related Topics (http://www.albany.edu/faculty/bec/hpschd-l/index.html)

Clavichord Websites

Boston Clavichord Society (http://www.mtholyoke.edu/~adurfee/bcs/)
British Clavichord Society (http:/saturn.nildram.co.uk/~bcs/index.htm)
Clavichord: A Forum for Makers, Players and Enthusiasts of the Clavichord (http://groups.yahoo.com/group/clavichord)
Finnish Clavichord Society (http://www.siba.fi/Klavikordiseura/english/welcome.html)

One hopes that the above listings of subject sources do not entirely overwhelm or overly dismay the reader. This mountainous range of materials—which, I need to emphasize, is necessarily selective, not exhaustive—is provided mainly in the hopes of revealing what a vast wealth of material on the widest possible panorama of subjects now potentially lies at any reader's disposal. Further, the perusal of any issue of the *RILM* (Répertoire International de Littérature Musicale) *Abstracts of Music Literature*, an incredible set of reference tomes begun in 1966, reveals abstracts on a massive array of published subjects, including those on keyboard instruments, and furnishes yet further indications of the great extent of recent organological researches.

If the present volume is necessarily restricted to the subject of harpsichords and clavichords to the exclusion of other keyboard instruments, it is still a daunting assignment to assemble a list of topics that, to a great extent, have already been covered by so many reference works—especially those most organologically up to date. The glossaries of many such reference books—especially those of recent decades—have been, I am happy to admit, an aid to me in compiling a comprehensive, if not all-en-

compassing, list of suitable subjects. The ultimate aim has been to provide as much information as might (at least initially) help the reader—whether a curious neophyte or a well-versed organologist—through a simple definition or a more comprehensive article. A bibliography at the conclusion of most entries will, it is hoped, guide the reader to further explorations and explanations where necessary. Yet, wish as one might, not all information can always be provided or included. Nor can all questions be ideally answered, especially as debate still exists in a number of areas—for example, the scientific origins and exegesis of the earliest harpsichords, the etymology and definition of such terms as *chekker*, or detailed consideration of metallurgical string content and uses. No effort has been made to align the comments of the many contributing authorities so that they agree on all points, but if one can have differing opinions on such disparate subjects as religion, medicine, and politics, why not on the harpsichord or clavichord as well?

Illustrations have been acquired from a multitude of credited sources, all supplemental to the articles herein. And among the over twelve hundred subjects and definitions one will find in this volume, I thought it important to include a number of topics that might at first thought seem unusual, though not entirely unrelated. For example, terms such as *glissando*, and information on certain aspects of performance practice such as registration, fingering, and ornamentation, may bear on the playing of certain instruments (clavichord *bebung*, for instance). Mention has already been made of the harpsichord and clavichord in contemporary life, but I have also added entries regarding synthesizers, with their ubiquitous harpsichord stops. Articles on decoration, iconography, and even mottos will be found, as will the variegated subjects of tunings and temperaments, conservation and restoration, acoustics, microtonal instruments, metallurgy, plectra quilling and voicing, inventors, and instrument collections of such notable regents as Frederick II and Maria Barbara of Spain. Other less common subjects include the fakes of Leopoldo Franciolini; the employment of harpsichord and clavichord by Ludwig van Beethoven, Joseph Haydn, and Wolfgang Amadeus Mozart; conducting; the functions of the harpsichord in opera and orchestras; and, as a result of some interesting recent researches, the histories of the harpsichord in China and Russia and the use of the clavichord in France.

The reader will find terms defined in different languages to deal with the difficulties of reconciling different languages' names (for example, in Spain *monacordio* meaning the clavichord, *clavicordio* the harpsichord).

It remains for me to acknowledge the great help, guidance, suggestions, and recommendations that I have had from so many of the authors involved, and I wish in particular to thank Frank E. Cooper, Sheridan Germann, Martha Goodway, Ferdinand de Hen, Diane Hubbard and Hendrik Broekman, John Koster, Edward L. Kottick, George Lucktenburg, Nicolas Meeús, Charles Mould, Rudolf Rasch, and Howard Schott for their encouragement and ideas—and, of course, Robert Palmieri, who in 1989 was responsible for introducing me to this project in the first place. Not least, I am most appreciative of all the distinguished contributors who waited so patiently for the completion of this volume.

Igor Kipnis
West Redding, Connecticut
Spring 2001

Editor's Note

It is unfortunate that Igor Kipnis did not live to see the completion and publication of his volume dealing with the harpsichord and clavichord. He died in January of 2002. Kipnis was a passionate teacher, a versatile performer, and an articulate spokesman for the arts. He will be sadly missed. Thanks go to Routledge for producing this second volume in the *Encyclopedia of Keyboard Instruments series.* We appreciate Kipnis's work and the work of the many contributing authors who shared their expertise and devotion to this undertaking. Kipnis, along with the contributing authors, essentially generated this volume. I am sure the reader will enjoy and benefit from this outstanding compilation of subjects on the harpsichord and clavichord.

A number of people have been instrumental in the completion of this volume. For their contributions, many thanks are due to Simina Calin, Richard Carlin, Matthew Griffin, Richard Kassel, Shannon McLachlan, Lori Rothstein, and Robert Zappulla.

ROBERT PALMIERI
SERIES EDITOR, ENCYCLOPEDIA OF KEYBOARD INSTRUMENTS

List of Illustrations

Fig. 1. The generation of a sine wave (p. 3).
Fig. 2. A standing transverse wave (p. 3).
Fig. 3. Harpsichord by Joaquim José Antunes, 1758 (p. 8).
Fig. 4. Arpichordium from virginal by Andreas Ruckers the Elder, 1610 (p. 12).
Fig. 5. Single-manual Italianate harpsichord by Mars McMillan (p. 16).
Fig. 6. Clavichord by Ferdinand Hofmann, Vienna, ca. 1795 (p. 16).
Fig. 7. Barring (p. 27).
Fig. 8. Harpsichord by Giovanni Battista Boni da Cortona, 1619 (p. 39).
Fig. 9. Bracing for Flemish harpsichord (p. 41).
Fig. 10. Bracing for Italian harpsichord (p. 41).
Fig. 11. Double-manual harpsichord by John Broadwood, 1793 (p. 42).
Fig. 12. Copy of a seventeenth-century Italian harpsichord by William Post Ross (p. 46).
Fig. 13. Large double-manual harpsichord by Johannes Petrus Bull, 1778 (p. 47).
Fig. 14. Interior of an Italian harpsichord (p. 56).
Fig. 15. Interior of a Flemish harpsichord (p. 56).
Fig. 16. Interior of a French harpsichord (p. 56).
Fig. 17. Drawing of a Gottfried Silbermann cembal d'amour (p. 58).
Fig. 18. Harpsichord case decorated with chinoiserie (p. 65).
Fig. 19. Fretted clavichord, anonymous, southern Germany, ca. 1720 (p. 74).
Fig. 20. German clavicytherium, anonymous, mid-eighteenth century (p. 81).
Fig. 21. Recitative by Pasquali, 1763 (p. 101).
Fig. 22. Engraving from *The modern musick-master* by Peter Prelleur, 1730 (p. 102).
Fig. 23. Bentside spinet by John Crang, 1753 (p. 109).
Fig. 24. Domenico Scarlatti: Sonata, K. 120 (Venice, 1742) (p. 111).
Fig. 25. Harpsichord by Jean-Marie Dedeban, 1770 (p. 132).
Fig. 26. Virginal by Charles Rewallin, 1675 (p. 139).
Fig. 27. Double-manual harpsichord by Thomas and Barbara Wolf, 1990, after Blanchet, 1730. (p. 145).
Fig. 28. Spinet by Albert Delin, Tournai, 1765 (p. 147).
Fig. 29. Ferruccio Busoni at Dolmetsch-Chickering harpsichord (p. 152).
Fig. 30. Clavichord by Denzil Wraight after Dominicus Pisaurensis, 1544 (p. 153).
Fig. 31. Harpsichord by Johannes Daniel Dulcken, Antwerp, 1745 (p. 159).
Fig. 32. Harpsichord by Burkat Shudi and John Broadwood, London, 1772 (p. 164).
Fig. 33. Harpsichord, Anonymous, Paris, 1667 (p. 185).
Fig. 34. Harpsichord by Joannes Couchet I, ca. 1650 (p. 185).
Fig. 35. Harpsichord by (Joannes) Josephus Couchet, Antwerp, 1680 (p. 186).

Fig. 36. Girolamo Frescobaldi, engraving by Claude Mellan (p. 194).
Fig. 37. Italian fretted clavichord, anonymous, early seventeenth century (p. 195).
Fig. 38. Bowed harpsichord by Raymundo Truchado, 1625 (p. 200).
Fig. 39. Clavichord by Johann Paul Krämer and Sons, Göttingen, Germany, 1804 (p. 205).
Fig. 40. Harpsichord by Jacques Germain, Paris, 1785 (p. 211).
Fig. 41. Nineteen-tone keyboard for Hackleman-Wilson clavichord (p. 215).
Fig. 42. Harpsichord with additional piano action by Jacob Kirkman, London, (p. 232).
Fig. 43. Clavichord by Johann Bohak, 1794 (p. 239).
Fig. 44. Harpsichord by Jean-Henri Hemsch, Paris, 1736 or 1746 (p. 241).
Fig. 45. Spinet by Dennis Woolley, after Hitchcock (p. 244).
Fig. 46. Frank Hubbard in his workshop (p. 245).
Fig. 47. "Angel playing a harpsichord," from *Les Très-riches heures du duc de Berry* by Jean de Colombe, 1486 (p. 250).
Fig. 48. "Young Woman Playing a Clavichord," workshop of Jan van Hemessen (ca. 1500–1566). (p. 254).
Fig. 49. "The Morse and Cator Families" by Johann Zoffany (ca.1733–1810) (p. 256).
Fig. 50. Harpsichord by Jacob and Abraham Kirkman, London, 1776 (p. 257).
Fig. 51. Polygonal virginal by Joseph Salodiensis, Italy (1574); spinet by Francesco Poggio, Florence (1603) (p. 258).
Fig. 52. Italian double-manual harpsichord, anonymous, ca. 1650 (p. 270).
Fig. 53. Jack (p. 271).
Fig. 54. Upper (movable) and lower (fixed) jack guides (p. 272).
Fig. 55. Key frames — Italian and Flemish styles. (p. 279).
Fig. 56. Igor Kipnis playing a William Post Ross copy of a seventeenth-century Italian harpsichord (p. 290).
Fig. 57. Double-manual harpsichord by Joseph Kirkman, London, 1798 (p. 292).
Fig. 58. Ralph Kirkpatrick (p. 294).
Fig. 59. Hubbard Harpsichords (Sudbury, Massachusetts), parts for its French II harpsichord kit (p. 296).
Fig. 60. Knee lever (p. 297).
Fig. 61. Wanda Landowska at the harpsichord, 1944 (p. 302).
Fig. 62. Flemish virginal lid painting, ca. 1600, attributed to L. Toepot (p. 306).
Fig. 63. Harpsichord by Gommaar van Everbroeck, Antwerp, 1659 (p. 310).
Fig. 64. Lute-harpsichord by Willard Martin Harpsichords (Bethlehem, Pennsylvania) (p. 313).
Fig. 65. Drawing of Pascal Taskin spinet made for Marie Antoinette, Queen of France, 1778 (p. 320).
Fig. 66. Bentside spinet by Charles Haward, London. (p. 323).
Fig. 67. Automatic octave virginal by Samuel Bidermann the younger, Augsburg, Germany, ca. 1640 (p. 326).
Fig. 68. Mechanism of the clavichord (p. 327).
Fig. 69. Mechanism of the clavichord (detail) (p. 327).
Fig. 70. Mechanism of the harpsichord (p. 328).
Fig. 71. Harpsichord by Hans Moermans, 1584 (p. 336).
Fig. 72. Flemish muselar virginal by Carl Fudge, 1978, after Ruckers (p. 341).
Fig. 73. Harpsichord by J. C. Neupert after J. H. Hemsch, 1754 (p. 345).
Fig. 74. "Collegium musicum rehearsal for a cantata performance," anonymous, ca. 1775 (p. 351).
Fig. 75. Italian ottavino, anonymous, end of seventeenth century (p. 354).
Fig. 76. François Couperin, "Les Bagatelles" (*Livre de clavecin* II) (p. 373).
Fig. 77. Pleyel harpsichord (p. 378).
Fig. 78. Clavichord, anonymous, Portugal, eighteenth century (p. 382).

Fig. 79. Drawing of Queen Elizabeth's virginal, ca. 1570 (p. 390).
Fig. 80. Ribs (p. 408).
Fig. 81. Harpsichord by Jacob and Abraham Kirkman, London, 1776 (p. 409).
Fig. 82. Virginal by the Rossi workshop (p. 410).
Fig. 83. Double virginal by Hans Ruckers, 1581 (p. 416).
Fig. 84. Unfretted clavichord by Johann Christoph Georg Schiedmayer, Neustadt an der Aisch, Germany, 1796 (p. 428).
Fig. 85. Single-manual harpsichord by Shudi and Broadwood, 1775 (p. 433).
Fig. 86. Harpsichord by Robert Goble, after anonymous Spanish harpsichord, ca. 1700 (p. 439).
Fig. 87. Italian spinetta, anonymous, 1540 (p. 442).
Fig. 88. Vis-à-vis Flügel by Johann Andreas Stein, Germany, 1777 (p. 444).
Fig. 89. Keyboard tablature. Antonio de Cabezon, *Obras de Musica*, Madrid, 1578 (p. 456).
Fig. 90. Clavichord drawing by David Tannenberg (p. 457).
Fig. 91. Double-manual harpsichord by William Dowd, after Pascal Taskin, 1770 (p. 461).
Fig. 92. Harpsichord by Michele Todini, Rome, before 1676 (p. 483).
Fig. 93. Tongue (p. 484).
Fig. 94. Double-manual harpsichord by Trute and Wiedberg, Philadelphia, 1794 (p. 489).
Fig. 95. Elizabeth-Claude Jacquet de la Guerre, *Les Pièces de Clavessin*, 1687 (p. 498).
Fig. 96. Harpsichord by Christian Vater, Hanover, Germany, 1738 (p. 500).
Fig. 97. Polygonal virginal by Joseph Salodiensis, Italy, 1574 (p. 506).
Fig. 98. "The instrument maker's workshop" from Denis Diderot's *Encyclopédie ou Dictionnaire raisonné des sciences, des arts, et des métiers*, 1751(p. 518).
Fig. 99. Claviorganum by Valentin Zeiss, Linz, Austria, 1639 (p. 524).
Fig. 100. Double-manual harpsichord by Christian Zell, 1728 (p. 524).
Fig. 101. Triangular octave spinet by Girolamo Zenti, Rome, before 1668 (p. 524).

Abbreviations and Pitch Symbols

Abbreviations	Equivalent
b.	born
bapt.	baptized
bur.	buried
ca.	circa
ch.	chapter(s)
chr.	christened
d.	died
ed(s).	edited, edited by, edition, editor(s)
facs.	facsimile
fol.	folio
Fr.	French
Ger.	German
Gk.	Greek (ancient)
It.	Italian
Lat.	Latin
n. d.	no date known
n. p.	no place/no publisher known
Port.	Portuguese
r.	reigned
r°	recto
rev.	revised, revised by
ser.	series
Sp.	Spanish
trans.	translated, translated by, translation
v°	verso
vol(s).	volume(s)
§	section, paragraph

PITCH SYMBOLS

This book employs standard ways of indicating pitch for keyboard instruments.

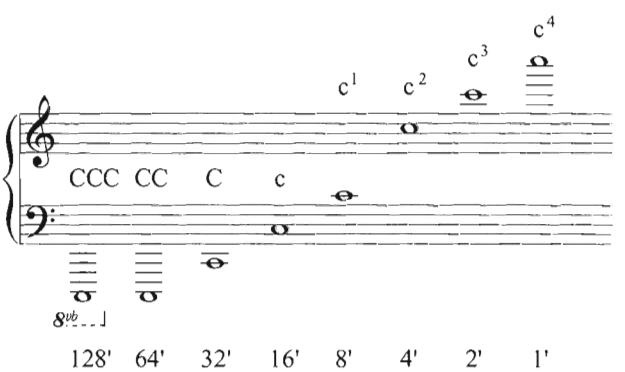
The system used to indicate different octaves is as follows:

The notes on the staff may be referred to by octave (multiple uppercase letters for lower registers ; lowercase letters with superscripts for higher registers). Ascending from any "C", the octave retains the same register indication (for example: CCC to BBB, CC to BB, C to B, c to b, c^1 to b^1, and so on).

(The wide range of the notation chart below does not reflect the more limited range of the harpsichord or clavichord.)

As a point of reference:

c^5	4 octaves above middle C
c^4	3 octaves above middle C
c^3	2 octaves above middle C (high C)
c^2	1 octave above middle C
c^1	middle C (of keyboard)
c	1 octave below middle C
C	2 octaves below middle C (low C)
CC	3 octaves below middle C
CCC	4 octaves below middle C



Common Reference Sources

In addition to the more specialized journal articles and books mentioned in the individual bibliographies for each article, the following general reference works were used in compiling this work and are referred to using these shortened forms.

BOALCH
Boalch, Donald H. *Makers of the Harpsichord and Clavichord 1440–1840*. 1956. 3d ed. Oxford: Oxford University Press, 1995.

HUBBARD
Hubbard, Frank. *Three Centuries of Harpsichord Making*. Cambridge, MA: Harvard University Press, 1965.

MGG
Blume, Friedrich, ed. *Die Musik in Geschichte und Gegenwart*. 1949–68; supplement, 1973–79. 2d ed., ed. Ludwig Finscher. Kassel, Germany: Bärenreiter, 1994–2005.

NEW GROVE
Sadie, Stanley, ed. *The New Grove Dictionary of Music and Musicians*. 1980. 2d ed., ed. Stanley Sadie and John Tyrrell. London: Grove/Oxford University Press, 2001.

NEW GROVE MUS INSTRU
Sadie, Stanley, ed. *New Grove Dictionary of Musical Instruments*. London: Macmillan, 1984.

RUSSELL
Russell, Raymond. *The Harpsichord and Clavichord*. 1959. 2d ed., rev. Howard Schott. London: R. MacLehose, 1973.

A

AARON [ARON], PIETRO (CA. 1480–CA. 1550)

Italian musician and music theorist. Although born in Florence, where Aaron claims to have known Agricola, Isaac, Josquin, and Obrecht, there is no record of his life prior to 1515, when he was cantor at the cathedral in Imola, a position he held for seven years. He then moved to Venice, where he was employed by Sebastiano Michiel, Grand Prior for the Order of St. John of Jerusalem, becoming its musical director. In 1536 Aaron took orders and moved into a monastery in Bergamo (where he died). Aaron provided, in his treatise *Toscanello in musica*, the first instructions for tuning keyboard instruments that can rather securely be interpreted as MEANTONE TEMPERAMENT. The work was so popular that it was reprinted as late as 1562.

See also **Temperament**

RUDOLF A. RASCH

Bibliography

Aaron, Pietro. *Toscanello in musica*. Venice, 1523; 2d ed., 1529; 3d ed., 1539. Facs. of 3d ed., Kassel, Germany: Bärenreiter, 1970.

Bergquist, Peter. "The Theoretical Writings of Pietro Aaron." Ph.D. diss., Columbia University, 1964.

ABGLITSCHEN

(Ger., glide off, slip off.) A clavichord action in which the finger "slides off" the KEY FRONT for a clear, controlled TOUCH.

JOAN BENSON

ACCENT

During the earlier part of the seventeenth century, the term *accent* appears to have been employed by the French as a generic expression for "ornament." For example, in the introduction to his *Hymnes de l'Eglise* (Paris, 1623), Jehan Titelouze remarks that accents "enliven" the parts, but that "the difficulty of setting type for all the notes that would be required has compelled me to leave them to the judgment of the player." By the beginning of the eighteenth century the term appears to have acquired a specific meaning in French sources, usually referring to a single-note grace also known as the *aspiration* or *plainte*.

See also **Ornamentation**

VINCENT J. PANETTA

Bibliography

Neumann, Frederick. *Ornamentation in Baroque and Post-Baroque Music*. Princeton, NJ: Princeton University Press, 1978.

ACCIACCATURA

(It. *acciaccare*, to pound or crush.) Perhaps the most affected form of keyboard ORNAMENTATION, as well as the most curious. It is a short grace note a minor second below the note to which it is attached. In manuscript form it is indicated by a small note having an oblique stroke across the stem, this being placed immediately to the left of the note to which it is attached. This semitone dissonance is only of the briefest duration, the two keys being struck simultaneously but the lower one released immediately. Its use is restricted almost

exclusively to organ music, although it can be used to some effect in certain virginal and spinet pieces. It is predominantly used in early English and some early German music, but is unknown to the classical French school which has its not dissimilar *coulé* used to great effect by, among others, François COUPERIN.

Today the acciaccatura is hardly ever used and seldom taught, yet is widely confused with the short APPOGGIATURA. Unlike the basic type of MORDENT or the appoggiatura (to which it is closely related), the acciaccatura is a dissonance, the resolution of which gives a pleasurable affirmation of the note to which it is attached. Acoustically it is said to relate to the phenomenon of an out-of-tune piano sounding louder than one in perfect pitch. If one accepts this, then acciaccatura is an ACCENT to the incipit of a note that is of the most elegant kind.

ARTHUR W. J. G. ORD-HUME

ACCOMPANIMENT

The harpsichord is basic to ensemble performance throughout the seventeenth and most of the eighteenth centuries. Use of the "shorthand" known as FIGURED BASS was necessitated not only by composers' work schedules but by the changing performance conditions regarding ENSEMBLE size, ACOUSTICS, available instruments, and other factors. Accompaniment textures had to be invented to accommodate the immediate situation. Indeed, the bass itself could be modified by change of octave, octave doubling, embellishment, or simplification.

The relationship of harpsichord dynamics and musical texture is most pronounced in continuo playing (from which many characteristics of solo keyboard literature derive). To match the ebb and flow of ensemble voicing and volume, the harpsichord part can range from complete silence or a solo bass line, to a delicate two-part texture, and progressively to full chords in both hands. The surface rhythm and linear density are as significant as the vertical fullness of the texture. Counterpoint per se seems to have been less usual than the homophonic "broken chord style" typical of much solo writing. Imitation and linear embellishment were most often restricted to pauses or quiescent areas in the accompanied part(s). In general, an effective minimum is preferable to distracting excess.

The CONTINUO harpsichordist's main dynamic resources are textural. Because of the ensemble context, featuring substantial variations in color and dynamics, the harpsichord's performance devices of ARTICULATION and timing, so important in solo playing, lose much of their significance. Past a certain point, articulatory silence merely diminishes the harpsichord's tone and pitch definition so that only the attack is perceived. AGOGIC ACCENT must be coordinated with other ensemble members, whose stresses will often be made dynamically. Similarly, certain types of arpeggio and suspended attacks can confuse the attack of the ensemble. Mordents, especially in the bass, were a common resource for accompanimental accent, as was the ACCIACCATURA (especially characteristic of Italian accompaniment).

See also **Arpeggiation; Ornamentation**

RICHARD TROEGER

ACOUSTICS

Every musical action can be considered as the production of a chain of energy. The way this energy travels through the several parts of a system determines the final result: the sound we hear. A very important phase in the process of making music on a STRING is the instrument itself. Being an energy system of its own, the important moments of its acoustic chain of energy are:

the striking of the string, initiating the movement of energy through and the disturbance of the equilibrium of the no longer still string
the oscillation of the string within the limits of its length and STRING TENSION
the radiation of sound from the string at an object that enhances and projects the sound into the surrounding air

All of these moments are governed by general mathematical and physical rules, but their actual behavior is affected significantly by the nature and use of the instrument and its environment. In the case of string keyboard instruments, the sound they produce derives to a great degree from the nature of the WIRE or gut used, the type and placement of the JACKS or TANGENTS striking the string, the makeup and location of the SOUNDBOARD and other sound-reflecting elements within the instrument itself, and the nature of the space into which the sound is being projected. A harpsichord can be strung so as to fill a medium-sized room with sound, or to be an active participant in an ENSEMBLE or a Baroque orchestra. A clavichord is traditionally conceived as a domestic instrument, for personal use.

However, the greater part of acoustic events has to do with periodic motions. A periodic motion consists of the repetition of a basic movement in equal intervals of time, such as the swinging of the pendulum of a clock. The time that is needed for such a single motion is called the periodic T, and is expressed in seconds. For the clock pendulum, this is the time to go from its perpendicular position (equilibrium) to the right, back

to the equilibrium, to the left, and back to the perpendicular position. The number of times such a single motion (or cycle) takes place in one second is called the FREQUENCY (f):

$$f = 1/T$$

and is expressed in hertz (Hz; 1Hz = one cycle per second).

We are also interested in the distance of the mass (m) from its equilibrium position. At every time (t), this distance is called the displacement, or elongation (y) of the swinging mass. The maximum displacement is called the amplitude (a), because the periodic motion takes place in two directions between $-a$ and $+a$:

$$-a < y < +a$$

It is useful to represent periodic motion by a graph of displacement (y) versus time (t). Some periodic motions have special characteristics. Of great importance in music is simple harmonic motion, which is characterized by the fact that the force that drives the mass to return to its equilibrium position is proportional to the displacement of this mass from its equilibrium. Simple harmonics can be represented by the projection of a point (p) traveling at constant speed around a circle; the projection is a sine wave.

In longitudinal waves, the particles move in the same or opposite direction of that of the wave. A fine example of a longitudinal wave is given by the movement of a disturbed spring.

The continuous pulsation of a string gives birth to yet another phenomenon. The interference of initial and reflected pulses will create the impression that the wave no longer moves. The result is a standing transverse wave, having "nodes" at points of destructive interference with resulting zero pressure, and "antinodes" at points of constructive interference with maximal pressure. The presence of "nodes" and "antinodes" allows the string to oscillate in several ways, or modes. For instance, if we consider a node that is in the middle, it divides the air column in two halves, and the column will also oscillate as two halves together with

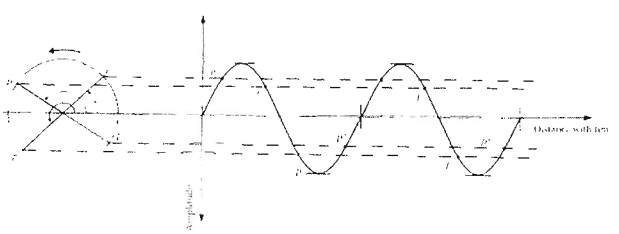


Fig. 1. The generation of a sine-wave: the traveling of a point (p) around the circle, projected on a system of coordinates.

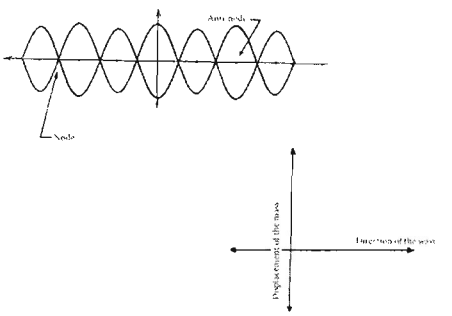


Fig. 2. A standing transverse wave, with nodes at points of destructive interference with zero displacement and antinodes at points of constructive interference with maximum displacement.

its basic vibration. Typically, every node produces its own frequency; as an aggregate, these are called PARTIALS (overtones).

The series of partials is a harmonic series. When we consider the fundamental frequency to be a result of the first mode, then the subsequent oscillation modes will result in the frequencies of the octave, the twelfth, the fifteenth, the major seventeenth, and so on, above the fundamental frequency. The present and relative strength of partials is very important for the final tone quality.

See also **Action; Timbre; Tone; Wood**

PETER G. C. VAN POUCKE

Bibliography

Askill, John. *Physics of Musical Sounds.* New York: Van Nostrand, 1979.

Backus, John. *The Acoustical Foundations of Music.* London: John Murray, 1970.

Campbell, Murray, and Clive Greated. *The Musician's Guide to Acoustics.* New York: Macmillan, 1987.

Helmholtz, Hermann von. *Die Lehre von den Tonempfindungen als physiologische Grundlage für der Theorie der Musik.* 4th ed., Berlin, 1877. Trans. Alexander J. Ellis as *On the Sensations of Tone as a Foundation of Music Theory.* 2d ed., 1885. Reprint, New York: Dover, 1954.

Rossing, Thomas D. *The Science of Sound.* 2d ed. Reading, MA: Addison-Wesley, 1990.

White, Harvey E., and Donald H. White. *Physics and Music: The Science of Musical Sound.* Philadelphia: Saunders College, 1980.

ACTION

A generic term referring to the mechanisms of stringed keyboard instruments that transfer the TOUCH of the finger, as a key is depressed, to sound as the string is plucked or struck. This includes the KEYBOARD, JACK, the REGISTERS, the JACK RAIL, and the COUPLER on two-manual keyboards; all accompanying components of each part and their combined functioning; and the KEY

LEVER and TANGENT of clavichords. Descriptions of specific instruments' actions are given in articles on individual instruments.

See also **Clavichord; Clavicytherium; Harpsichord**

MARITZA H. F. MASCARENHAS

ADJUSTMENT SCREW

A device that adjusts the relative position of parts in an ACTION. Richard Wakefield took a patent in 1771 that covered almost exactly the same ground as that taken out by Roger PLENIUS thirty years earlier. It concerns the use of ivory and metal plectra, and a device for "tuning and keeping in tune harpsichords, spinnets and fortepianos," a prototype for some form of fine adjustment screw.

Products of industrial revolution technology, they were first used by piano makers to facilitate the REGULATION of increasingly complex mechanisms. Their use carried over into early revival harpsichords to position the height and projection of the PLECTRUM in relation to its string. In some PLEYEL harpsichords, they appear in the form of fine TUNING SCREWS similar to those on violins. They are seldom used by modern makers, whose instruments reflect the pre–Industrial Revolution technology of period instruments.

See also **Capstan Screw; End Pin; Voicing Screw**

CHARLES MOULD
RICHARD WYTON

Bibliography

Patents for Inventions. Abridgements of Specifications Relating to Music and Musical Instruments A.D. 1694–1866. 2d ed. London: Eyre and Spottiswoode, 1871. Reprint, London: Tony Bingham, 1984.

ADLUNG, JACOB (JAKOB) (1699–1762)

German organist, writer, and organologist (b. Bindersleben, near Erfurt, 14 Jan. 1699; d. Erfurt, 5 July 1762). Adlung (also Adelung) was the son of a teacher and organist, David Adlung, who was responsible for his son's earliest training in music. His first schooling away from his father took place at the St. Andreas lower school in Erfurt, beginning in 1711. He continued at the Erfurt Gymnasium (from 1713), studying organ playing at the same time with Christian Reichardt, with whom he was then lodging. The year 1723 saw his matriculation at the university at Jena, where he not only continued his musical studies but also those of philosophy, philology, and theology. His study of organ continued with Johann Nicolaus BACH. He became acquainted with Johann Gottfried WALTHER in Weimar, and thereby gained access to books on the theory of music. His interest in theoretical works was so great that he wrote several works on theory himself; most of these were lost when his home perished in a fire in 1736. After his graduation from the university at Jena in 1726, he was recalled to Erfurt to succeed the recently deceased Johann Heinrich Buttstedt as the organist of the Prediger Church, a position he retained for the remainder of his life. He married Elizabeth Ritter, the daughter of the mayor of Gross-Wanzleben, in 1732. In addition to his duties at the church, he taught languages at the Erfurt Gymnasium as well askeyboard to numerous organ students (one source maintains that he claimed to have had at least 218 keyboard students in the course of his life).

Adlung is remembered particularly for his writings: *Vollständige Anweisung zum Generalbasse*, *Anweisung zur italienischen Tabulatur*, and *Anweisung zur Fantasie und zu den Fugen* (all three of which were lost in the fire of 1736); *Musica mechanica organoedi,* edited by J. L. Albrecht (Berlin, 1768); *Anleitung zu der musikalischen Gelahrheit* (Erfurt, 1758); and *Musikalisches Siebengestirn, Das ist: Sieben zu der edlen Tonkunst gehörige Fragen* (Berlin, 1768). The most important of these is *Musica mechanica organoedi,* which more than amply demonstrates Adlung's acumen and great interest in the construction and general workings of musical instruments. He, along with Walther, Johann MATTHESON, and L. C. Mizler, produced a highly comprehensive study of his art. In addition to his mastery of instrument making, Adlung also possessed an encompassing knowledge of the theory and aesthetics of music as well.

In addition to a wealth of encyclopedic information on the art of organ building, Adlung also provides an exhaustive account of the construction and mechanics of clavichords. Of the various types he describes, the most notable are the CEMBAL D'AMOUR, in which each string is tuned so that its striking point is exactly half its length (enabling both sides to vibrate, thus producing more sound than is ordinarily possible from a clavichord); the PEDAL CLAVICHORD (fitted with a full clavier and strings for the feet); and a device called the PANTALON stop, a series of tangentlike brass blades set in a movable bar so that they may be raised simultaneously by the action of a REGISTER lever. When activated, these blades are made to touch each string immediately to the right of the striking point of the tangents. The effect produced is that of sustaining the sound of the vibrating string after the key has been released. In addition to the mention of a CLAVIORGANUM, Adlung also describes a harp which is fitted with a keyboard, which he calls a CLAVIARPA or *Clavierharfe* (*Musica mechanica organoedi*, 139). That Adlung's knowledge also extended outside of Germany is shown by an article by François BÉDOS DE CELLES (published in the

Mercure de France in 1762, describing a new organ in St. Martin of Tours) that he translated into German for inclusion in *Musica Mechanica organoedi*.

DAVID SCHRADER

Bibliography

Adlung, Jacob. *Anleitung zu der musikalischen Gelahrheit.* Erfurt, Germany: J. D. Jungnicol, 1758; 2d ed., 1783. Reprint, Rochester, NY: University of Rochester Press, 1957. Reprint, Kassel, Germany: Bärenreiter, 1953.

———. *Musica mechanica organoedi.* Ed. J. L. Albrecht and J. F. Lorenz. 1768. Reprint ed., ed. Christhard Mahrenholz. Kassel, Germany: Bärenreiter, 1931.

———. *Musikalisches Siebengestirn. Das ist: Sieben zu der edlen Tonkunst gehörige Fragen.* Ed. J. L. Albrecht. Berlin, 1768.

AFFETTUOSO

(It., with affect.) A style of performance that stresses affect or EXPRESSION. The term is used in scores and discussions of music as a mark of expression, as a tempo marking, or as a modification of a tempo marking. Although the use of the term in scores before the eighteenth century is rare, seventeenth-century writers frequently refer to it in essays on music and other arts. The term is generically associated with music of slower tempo and/or pathetic nature, such as the second movement of the Fifth Brandenburg Concerto and the second movement of the Sonata for Violin and Basso Continuo in G Major by JOHANN SEBASTIAN BACH. *Affettuo*, as used by CARL PHILIPP EMANUEL BACH, is a description of tone, particularly on the clavichord and synonymous with BEBUNG, a means of enhancing the emotion or affect of a passage by using a vibrato on notes of long duration, achieved by gently varying the pressure of the fingers on the key after it is depressed until the note is released. During the eighteenth century, affettuoso playing was called for in musical instruments in which the dynamic level could be controlled by the player.

MARITZA H. F. MASCARENHAS

Bibliography

Bach, Carl Philipp Emanuel. *Versuch über die wahre Art das Clavier zu spielen.* 2 vols. Berlin: G. L. Winter, 1753, 1762. Trans. and ed. William J. Mitchell as *Essay on the True Art of Playing Keyboard Instruments.* New York: W. W. Norton, 1949.

Neupert, Hanns. *Das Klavichord.* Kassel, Germany: Bärenreiter, 1948. Trans. Ann Feldberg as *The Clavichord.* Kassel, Germany: Bärenreiter, 1968.

AFINADOR

A small, strung keyboard instrument, presumably with a HARPSICHORD ACTION, on which a whole tone is divided into nine portions or commas; also known as a *templante*. Its function was to illustrate tuning subtleties in IRREGULAR TEMPERAMENTS, such as the difference between major and minor semitones. Antonio SOLER is credited with technical innovations that enabled him to complete at least two of these instruments successfully.

See also **Enharmonic Keyboard**

RICHARD WYTON

AGOGIC ACCENT

(Ger. *Agogik.*) A term originating with Hugo Riemann to indicate, by analogy with dynamics, a shading of note value in order to create emphasis, especially in harmonic suspensions. It has come to mean any rubato or nuance of time in performance—for example, a delay in order to create accentuation, or an elongation in order to emphasize dissonance.

JOHN METZ

AGRÉMENT

(Fr., embellishment.) A generic term for ORNAMENTATION; also, the standardized signs or symbols for different ornaments. The term may be used in combination (e.g., *agréments du chant*, [melodic embellishments]; *agréments de musique*, [musical embellishments]). Brought into practice in French music of the seventeenth century, such embellishments, usually indicated by symbols or notes in small type, eventually became the norm in all European music and were in use into the Romantic period.

MARITZA H. F. MASCARENHAS

AGRICOLA [SORE], MARTIN (1486–1556)

German Protestant musician and teacher (b. Schwiebus [now Świebodzin, Poland], 6 Jan. 1486; d. Magdeburg, 10 June 1556). Agricola wrote many didactic works on music, most of them published by Georg Rhau in Wittenberg. His *Musica instrumentalis deudsch* (1529), written in German verse, is based loosely on Sebastian VIRDUNG's *Musica getutscht*, from which many of the woodcuts are taken, including a keyboard of thirty-eight notes and—reversed, as in Virdung—the clavichord, clavicimbalum, virginals, and clavicytherium. The images are all lacking in Agricola's substantially revised second edition (1545). Both modern German editions are problematic; several pages from *Musica figuralis deudsch* are missing in the 1969 version, while the drawings in Eitner's diplomatic edition are unreliable.

WILLIAM E. HETTRICK

Bibliography

Agricola, Martin. *Musica figuralis deudsch, 1532: Im Anhang: Musica instrumentalis deudsch*, 1529; *Musica choralis deudsch, 1533*; *Rudimenta musices, 1539*. Facs. ed., Hildesheim, Germany: G. Olms, 1969.

———. *Musica instrumentalis deudsch, erste und zweite Ausgabe*. Ed. Robert Eitner. Publikationen älterer praktischer und theoretischer Musik-Werke 24, vol. 20. Leipzig: Breitkopf und Härtel, 1896.

———. *The "Musica Instrumentalis Deudsch": A Treatise on Musical Instruments, 1529 and 1545*. Trans. William E. Hettrick. Cambridge: Cambridge University Press, 1994.

Engelke, Bernhard. "Agricola, Martin." In *MGG*.

Funck, Heinz. *Martin Agricola, ein frühprotestantischer Schulmusiker*. Wolfenbüttel, Germany: Georg Kallmeyer, 1933.

Hüschen, Heinrich. "Agricola, Martin." In *New Grove*.

ALEMBERT, JEAN LE ROND D'

SEE D'ALEMBERT, JEAN LE ROND

ALFONSO II ESTE, DUKE OF FERRARA (1533–1597)

Italian duke (b. 1533; d. Ferrara, 27 Oct. 1597), the last in the Ferrarese Este line (r. 1572–97). Collections of several documents and inventories attest to the wealth of keyboard instruments at the court of Ferrara during his reign. A newly invented quilled instrument with two rows of strings and three kinds of sound was offered to Alfonso in 1595. Since it was described as useful for concerts due to its pitch and volume, as well as for a chamber with a softer sound, it might well be the "piano e forte" instrument with an organ underneath "used by the duke" and mentioned several times.

Alfonso's nephew, Cesare, took the instruments to Modena after 1598 and was provided inventories thereof in 1612 and 1617. Instruments with two registers number between nine and twelve in all, along with five CLAVIORGANA. More specific inventories of organs and harpsichords describe 8' and 4' instruments (and apparently one 16'), several with split sharps, designed for the theater or for the chamber. One *clavicembalo cromatico* with two keyboards may have been one of two attributed to Vito TRASUNTINO and known to have been played by Luzzasco Luzzaschi, teacher of Girolamo FRESCOBALDI and virtuoso on the ARCHICEMBALO. Giovanni Antonio BAFFO, Alessandro BERTOLOTTI, "Il Genovese," "Ungaro" (Franciscus Patavinus), and others are listed as builders of eighteen harpsichords and four spinets in the inventories.

LUCY HALLMAN RUSSELL

Bibliography

Valdrighi, Luigi Francesco. "Cappelle, concerti e musiche di Casa d'Este (dal sec. XV al XVIII)." In *Atti e memorie delle RR. Deputazioni di Storia Patria per le provincie modenesi e parmensi*, ser. 3, vol. 2. Modena, Italy, 1883.

———. *Musurgiana* (n.p., [1873]). Reprint, Bologna: Forni, 1970.

ALL'OTTAVA

(It., at the octave.) In CONTINUO playing, a direction to play the FIGURED BASS line in octaves, rather than harmonizing it.

See also **Tasto Solo**

JOHN METZ

ALL'UNISONO

(It., in unison.) A musical passage in which all instruments play in unison or in octaves (ALL'OTTAVA). CARL Philipp Emanuel BACH notes that composers sometimes inadvertently leave figures in an all'unisono passage even when they do not want a realization, and that an alert CONTINUO player will cease filling in chords and accompany only in unison (or octaves) when he hears the ensemble playing in unison. However, Bach adds that a fuller realization may be required when the unison movement of a bass theme is figured, especially when the theme implies a harmony filled with SUSPENSIONS. Many unisono passages in George Frideric Handel's oratorios bear autograph figures, some added to the finished performance copy; such figures are thus not merely a part of the composer's working process to be discarded later. Certainly some pieces, such as "Sommi Dei" from *Radamisto* (1720) or "Tirannia gli diede il regno" from *Rodelinda* (1724), would benefit from realization.

See also **Tasto solo**

JOHN METZ

Bibliography

Bach, Carl Philipp Emanuel. *Versuch über die wahre Art das Clavier zu spielen*. 2 vols. Berlin: G. L. Winter, 1753, 1762. Trans. and ed. William J. Mitchell as *Essay on the True Art of Playing Keyboard Instruments*. New York: W. W. Norton, 1949.

Rogers, Patrick John. "Thoroughbass Accompaniment in Handel's Operas and Oratorios." Ph.D. diss., Claremont Graduate School, 1986.

AMMERBACH, ELIAS NIKOLAUS (CA. 1530–1597)

German organist and composer (b. Naumberg, ca. 1530; d. Leipzig, buried 29 Jan. 1597). Ammerbach

was organist at the Thomaskirche in Leipzig and composer of two collections (1571, second ed. 1583; 1575) of keyboard intabulations, in which he introduced "new German tablature" (whereby letters show all the pitches). A copy of the 1571 volume was owned by JOHANN SEBASTIAN BACH. The 1571/1583 collection contains some twenty varied and well-shaped melodic exercises, each fingered for both hands. These exercises, along with Hans BUCHNER's fingerings (ca. 1530) of several four-note groups and of a motet, provide our only information about the FINGERING of the passagework encountered in the *Fundamentum* books of the preceding one hundred years and in the South German intabulations of the later sixteenth century.

For each of his exercises Ammerbach gives only one fingering solution for each hand; by contrast, many of the exercises of Tomás de SANTA MARÍA (1565) show fingering choices. There is agreement among Ammerbach, Buchner, and Girolamo DIRUTA (1593) concerning downward scale fingering: right hand (RH) = 43 23 23, left hand (LH) = 23 23 23. For RH upward, Ammerbach and Diruta give 23 23 23, whereas Diruta gives 23 43 43. For LH upward, Buchner and Diruta give 43 23 23, mirroring the RH downward, whereas Ammerbach gives the interesting 4321 4321 (even when the thumb plays a B♭).

General observations about Ammerbach's fingering include:

1. The turn figure starts with the third finger in the RH, but with the second finger in the LH. The LH thus makes frequent and consistent use of the thumb, while the RH never uses the thumb in the exercises (it is used in playing chords).
2. The four notes during a beat are often played by a four-note finger unit, and the last finger of a group is often reused to start the next group.
3. In the case of leaping triplet groups, however, Ammerbach expands and contracts the hand, possibly yielding a smoother transition between beats.
4. Ammerbach often uses the fingers of the RH differently from those of the LH in playing the same four notes, possibly producing contrasting subgroup ARTICULATIONS between the hands.

See also **Fingering; Tablature; Thumb, Use in Playing**

EDWARD PARMENTIER

Bibliography

Ammerbach, Elias Nicolaus. *Orgel oder Instrument Tabulaturbuch* (1571/1583). Ed. Charles Jacobs. Oxford: Clarendon Press, 1984.

Godman, Stanley. "Bach's Copies of Ammerbach's 'Orgel oder Instrument Tabulatur' (1571)." *Music and Letters* 38 (1957): 21–27.

Lindley, Mark. "Ammerbach's 1583 Exercises." *English Harpsichord Magazine* 3, no. 4 (1983): 58–67.

Rodgers, Julane. "Early Keyboard Fingering ca. 1520–1620." D.M.A. diss., University of Oregon, 1971.

Sachs, Barbara, and Barry Ife, eds. *Anthology of Early Keyboard Methods*. Cambridge: Gamut, 1981.

Santa María, Tomás de. *Libro llamado Arte de tañer Fantasia*. Valladolid, Spain, 1565. Facs. ed., Geneva: Minkoff, 1973. Trans. Barbara Sachs and Barry Ife in *Anthology of Early Keyboard Methods*. Cambridge: Gamut, 1981. Trans. Julia Aranguren and Orpha Ochse as "How to Play with Complete Perfection and Excellence." *American Organist*, June, 1979, 30. Trans. ed. by Almonte C. Howell, Jr. and Warren E. Hultberg as *The art of playing the fantasia*. Pittsburgh, PA: Latin American Literary Review Press, 1991.

AMPLIFICATION

The process of increasing the dynamic level of the harpsichord by electronic means. Although the tonal capacity of the harpsichord is best suited to small halls (like those in which its traditional repertoire was originally performed), some modern performers have desired to use the instrument in large concert halls, with large orchestras, and even outdoors, where its tone has been unjustly criticized. This has led to a variety of attempts to amplify the instrument electronically.

Microphones have not always been satisfactory in amplifying the harpsichord, because of feedback from speakers, interference from other instruments, and the equipment's selective response to the frequencies of the closest strings. One solution has been to design a harpsichord with a built-in amplification system consisting of numerous electronic "pickups" (tiny microphones) placed as close as possible to each string. An example of this would be the Baldwin electric harpsichord designed by Caleb Warner for use in jazz and rock music. Unfortunately, the necessity of keeping pickups close to the strings again severely distorts the tone of the instrument, with the resulting sound more like "a glorified electric guitar operated by a keyboard" (Zuckermann).

Attempts at creating louder harpsichord sounds have also been partially realized through the development of the electronic SYNTHESIZER.

STEPHEN MELLO

Bibliography

Zuckermann, Wolfgang Joachim. *The Modern Harpsichord: Twentieth-Century Instruments and Their Makers*. New York: October House, 1969.

AMPLIFYING CLAVICHORD

SEE CLAVICHORD, AMPLIFYING

ANÉMOCORDE (AERO-CLAVICHORD)

String keyboard instrument with a five-octave range presented to the French Royal Academy of Sciences in January 1790 by the makers Johann Jakob SCHNELL and Tschirszchi. The strings of the instrument were set into motion by directed jets of air. The academy's original report concerning the anémocorde was highly critical of the noise level of the apparatus; a second report was substantially more positive. Fétis reports that the instrument had disappeared by 1836.

LEE BRENTLINGER

Bibliography

Buchner, Alexander. "Sostenente piano." In *New Grove*.
Cohen, Albert. *Music in the French Royal Academy of Sciences: A Study in the Evolution of Musical Thought*. Princeton, NJ: Princeton University Press, 1981.
Fétis, François. *La musique misé a la portée de tout le monde*. 2d ed. Paris: Paulin, 1836.

ANTEGNATI, GIOVANNI FRANCESCO (FL. 1533–1544)

Italian harpsichord maker. Little is known about Antegnati (Johannes Franciscus Briscianus), a member of the renowned Brescian organ-building family. According to Giovanni Maria LANFRANCO, he was a builder of "monochordi [clavichords], Arpicordi, & Clavacymbali." Only four *arpicordi*, or polygonal virginals, by Antegnati are extant. One (Rome, private collection) has a lid painting of King David with his harp, referring to the origin of the term *arpicordo* mentioned by Vincenzo GALILEI and Adriano BANCHIERI. A younger relative by the same name serves as the intelligent son in the Socratic dialogue in Costanzo Antegnati's *L'arte organica* (1608).

See also **Arpichordum**

LUCY HALLMAN RUSSELL

Bibliography

Klotz, Hans "Antegnati." In *New Grove Mus Instr.*
Lanfranco, Giovanni Maria. *Scintille di musica*. Venice, 1533. Facs. ed., Bologna: Forni, 1970.

ANTONIUM PATAVINUS

SEE PATAVINUS

ANTUNES

Portuguese harpsichord and pianoforte builders. Evidence suggests that four members of this family worked in Lisbon during the eighteenth and nineteenth centuries. The name of Joaquim José Antunes is only known on two harpsichords (Lisbon, Collection Instituto Português do Património Cultural, 1758; Goudhurst, England, Finchcocks Museum, 1785), but two different builders seem to have been involved. One Joaquim José Antunes might have been the father or brother of the well-known Manuel Antunes; the other one was certainly a son of the latter. In 1760, Manuel Antunes received the royal privilege to build and sell *cravos de martelos* (pianofortes) exclusively for ten years. In addition to two harpsichords mentioned by Lambertini and now lost, pianofortes survive in England (private collection) and the United States (National Music Museum, Vermillion, SD). No instruments by João Baptista Antunes, grandson of Manuel Antunes and owner of a workshop for keyboard instruments registered in the 1830s, survive; João Baptista Antunes died after 1865.

GERHARD DODERER

Bibliography

Doderer, Gerhard. "Aspectos novos em torno da estadia de Domenico Scarlatti na corte de D. João V (1719–1727)." *Revista Portuguesa de Musicologia* 1 (1991): 147–74.
———. "Instrumentos de tecla portugueses no século XVIII." *Bracara Augusta* 28 (1974).
Lambertini, M. *Fabricação de Instrumentos Musicais em Portugal*. Lisbon, 1910.
Meer, John Henry van der. "Um cravo português desconhecido em propriedade particular na Alemanha." *Boletim da Associação Portuguesa de Educação Musical* 52 (1987).

Fig. 3. Harpsichord by Joaquim José Antunes, 1758.

———. "Um cravo português desconhecido em propriedade particular em Inglaterra." *Boletim da Associação Portuguesa de Educação Musical* 58 (1988): 17–22.
Pollens, Stewart. "The Early Portuguese Piano." *Early Music* 13, 1 (1985): 18–27.

APPOGGIATURA

(It. *appoggiare*, to lean; Ger. *Vorschlag*; Sp. *apoyadura*; Fr. *port-de-voix*, *appoggiature*, *appuy*; Old Eng. beat; Old Fr. *cheute, chûte.*) A dissonant ornament, generally an eighth note in NOTATION; similar Italian terms include *accento*, *exclamatio*, or PORTAMENTO; English equivalents include *forefall*, *backfall*, *half-fall*, *lead*, or *prepare*. The appoggiatura connects or fills out INTERVALS beyond a second, frequently, although not exclusively, occurring on the beat and then resolving by an ascending or descending step to the main consonant note. In practice, this suggests that the appoggiatura receives greater emphasis than its note of resolution; however, unaccented single-note embellishments occurring before the beat may also be called appoggiaturas.

Appoggiaturas are of essentially two categories, long and short. The long appoggiatura always occurs on the beat. While the short appoggiatura may occur on the beat, it more often anticipates the beat in order to avoid poor voice leading. Interpretation is somewhat flexible; however, convention dictates that the long appoggiatura takes half or two-thirds of the value of the main note. The performer's good sense and musicality, together with the context and harmony, should help to achieve the correct value of the appoggiatura in relation to its main note.

See also **Ornamentation; Vorschlag**

MARITZA H. F. MASCARENHAS

Bibliography

Donington, Robert. *The Interpretation of Early Music.* London: Faber, 1963. Rev. ed., New York: W. W. Norton, 1992.
Neumann, Frederick. *Ornamentation in Baroque and Post-Baroque Music.* Princeton, NJ: Princeton University Press, 1978.

ARABESQUE

(Fr. *arabesque*; Ger. *Arabeske*; It. *arabesco.*) A family of intricately scrolling, interlacing linear designs, based in the Renaissance on Moorish-Saracenic ornament, often found on instruments, especially in Flemish printed papers and painted Flemish and French soundboard border ornaments. During the Baroque period the arabesque evolved into large-scale decorative schemes of CARTOUCHES and pictorial vignettes, illogically supported by a structure of scrolling plant-stem ornament and strapwork, often seen on French instrument CASES.

See also **Block Print Paper; Decoration; Grotesque; Lid**

SHERIDAN GERMANN

Bibliography

Guilmard, Désiré. *Les Maîtres Ornemanistes.* 2 vols. Paris: E. Plon, 1880–81.
Jessen, Peter. *Das Barock in Ornamentstich.* Berlin: Verlag für Kunstwissenschaft, 1926.
Jones, Owen. *The Grammar of Ornament.* London: Day and Son, 1856. Reprint of plates only, New York: Dover, 1987.
Pellegrino, Francesco. *La fleur de la science de pourtraicture: patrons de broderie, façon arabicque etytalique.* Paris, 1530. Facs. ed., Paris: J. Schemit, 1908.
Riegl, Alois. *Stilfragen.* Berlin: R. C. Schmidt, 1927.
Ward-Jackson, Peter. "Some Main Streams and Tributaries in European Ornament from 1500 to 1750." *Victoria and Albert Museum Bulletin* 3, nos. 2–4 (1967): 58–71, 90–103, 121–34. Reprinted in *Victoria and Albert Museum Bulletin* Reprints 3. London: Her Majesty's Stationery Office, 1969.

ARCADED FRONT

DECORATION on the vertical front of the NATURALS of the keyboard. Because the keys would otherwise display end-grain timber, it became the practice that these be covered with wood or, in later instances, ivory. The plain vertical surfaces encouraged decoration; the most common approach was to carve these into a series of arches or arcades, usually shaped by the maker using a rotating cutting instrument. Virtually all early makers embellished their KEY FRONTS in this manner.

ARTHUR W. J. G. ORD-HUME

ARCHICEMBALO

A microtonally tuned harpsichord (also called arcicembalo), invented by Nicola VICENTINO, the Italian Renaissance composer and music theorist. In his *L'antica musica ridotta alla moderna prattica* (Rome, 1555), Vicentino described a tonal system, best understood as a thirty-one-tone-per-octave scale, in which the whole tone is divided into five steps, two of them making up the minor semitone, three the major semitone. Each step can best be termed a form of DIESIS. In order to bring this into practice, Vicentino had built the archicembalo, a harpsichord with six ranks of keys arranged in two keyboards. The lowest rank (nearest the player) provides the naturals; the second, the ordinary sharps or flats (as well as keys between E and F, and between B and C); the third, the alternate flats and sharps of the second rank. In the second keyboard, the fourth rank provides diesis-raised naturals and the

fifth provides diesis-lowered naturals. The sixth rank (furthest from the player) is tuned one COMMA above the first rank.

Although the archicembalo became well known in its time, it was rarely used in actual practice because of its complex layout. Nevertheless, a number of similar instruments, mainly for research and experiments into Greek tuning systems and tuning and temperament systems in general, were built in Italy and elsewhere during the seventeenth century, of which the "Clavemusicum omnitonium modulis diatonicis, chromaticis et enharmonicis" by Vito TRASUNTINO (Venice, 1606) has been preserved in the Bologna instrument collection. Vicentino built, in addition to the archicembalo, an arciorgano with the same keyboard layout.

RUDOLF A. RASCH

Bibliography

Kaufmann, Henry. "More on the Tuning of the Archicembalo." *Journal of the American Musicological Society* 23 (1970): 84–94.

———. *The Life and Works of Nicola Vicentino (1511–c. 1576).* Rome: American Institute of Musicology, 1966.

———. "N. Vicentino's 'Arciorgano': An Annotated Translation." *Journal of Music Theory* 5 (1961): 32–53.

Maniates, Maria Rika. "Vicentino's 'Incerta et occulta scientia' reexamined." *Journal of the American Musicological Society* 28 (1975): 335–51.

Rippe, Volker. "Nicola Vicentino, sein Tonsystem und seine Instrumente: Versuch einer Erklärung." *Die Musikforschung* 34 (1981): 393–413.

Vicentino, Nicola. *L'antica musica ridotta alla moderna pratica.* Rome, 1555. Facs. ed., ed. Edward E. Lowinsky. Kassel, Germany: Bärenreiter, 1959. Trans. Maria Rika Maniates, ed. Claude V. Palisca as *Ancient Music Adapted to Modern Practice.* New Haven, CT: Yale University Press, 1996.

ARCISPINETTA

(It.; also spelled *arcispineta.*) A large SPINETTA. The name is only known from the nameboard of the 1610 Joannis CELESTINI rectangular virginals (Brussels Conservatory). It is unusual in having single strings instead of the usual closely spaced pairs. As a result, the instrument is deeper from front to back than is normal. The only apparent advantage is that the plectra may be a little longer than those of a conventional virginal. An even larger virginal, unusual in having two sets of 8' strings, was made by Donatus Undeus in 1623 and is in the same collection. This is not described by the maker as an arcispinetta (only by Boalch), but might be thought of as one.

DENZIL WRAIGHT

Bibliography

Boalch.

ARNAUT (ARNAULT) DE ZWOLLE, HENRI (CA. 1400–1466)

Doctor of medicine, astrologer, astronomer, and theorist (b. Zwolle, ca. 1400; d. Paris; bur. Dijon, 6 Sept. 1466). It is generally accepted that Arnault was born in Zwolle, Netherlands, though some have suggested that he may have been from Zuuolis, Bohemia. A polymath (he also made clocks and astronomical instruments), Arnaut de Zwolle studied at the University of Paris under Jean Fusoris, the canon of Notre Dame Cathedral. By 1432, Arnaut was in the service of Duke Philip the Good of Burgundy as a resident scientist, being paid six francs for two sundials. He may also have been a priest; shortly before 1450 he was awarded a canonical prebend at Onze-Lieve-Vrouwkerk, Bruges (Brugge). (Such benefices were at the disposal of Philip the Good, and their holders were exempt from the duty of residence at the church.) In 1454 Arnaut was paid one thousand francs for a planetarium. Sometime between 1454 and 1461 he left Dijon and entered the service of the French court in Paris under Charles VII and later under Louis XI. In August and September 1466 a great plague afflicted Paris; forty thousand people died, including Arnaut, "an able man of goodness, wisdom, and humor," according to Jean de Roye.

Arnaut de Zwolle's importance to musicology is his authorship of a manuscript treatise (Bibliothèque Nationale, Paris, Ms. latin 7295, ca. 1440) describing and illustrating the principles of the design of various keyboard chordophones, a lute, and three small organs; he also describes the disposition of several large organs around Dijon. His treatise is important not only to organologists but potentially to historians of science as well. Perhaps not as an innovator, but certainly as practitioner, Arnaut represented the most advanced technology of his time. His skills as a draftsman and mathematician were sufficient to define, explicitly or implicitly, all the dimensions of the seven small keyboard instruments he discusses. One must look to much later authors, such as Salomon de Caus (Frankfurt, 1615), Michael PRAETORIUS (Wolfenbüttel, 1619), and François BÉDOS DE CELLES (Paris, 1766–78), for comparable writings in organology.

WILSON BARRY

Bibliography

Barry, Wilson. "Henri Arnaut de Zwolle's *Clavicordium* and the Origin of the Chekker." *Journal of the American Musical Instrument Society* 11 (1985): 5–13.

Boalch.

Bormann, Karl. *Die gotische Orgel zu Halberstadt: Eine Studie uber mittelalterlichen Orgelbau*. Berlin: Merseburger, 1966.
Brown, Howard Mayer. "Arnaut de Zwolle, Henri." In *New Grove*.
Clutton, Cecil. "Arnault's MS." *Galpin Society Journal* 5 (1952): 3.
Coates, Kevin. *Geometry, Proportion, and the Art of Lutherie*. Oxford: Oxford University Press, 1985.
Le Cerf, Georges, and E.-R. Labande, eds. *Les traitès d' Henri-Arnaut de Zwolle et de divers anonymes*. Paris: Editions August Picard, 1932. Reprint ed. with postword by François Lesure. Kassel, Germany: Bärenreiter, 1972.
Lester, John. "The Musical Mechanisms of Arnaut de Zwolle" *English Harpsichord Magazine* 3, no. 3 (October 1982): 35–41.
Strohm, Reinhard. *Music in Late Medieval Bruges*. Oxford: Clarendon Press, 1985.
Williams, Peter. *A New History of the Organ from the Greeks to the Present Day*. Bloomington: Indiana University Press, 1980.

ARPEGGIATION

(It. *arpeggiare*, to play the harp.) The playing of notes of a chord in succession rather than simultaneously. Chords can be broken or spread in a measured or unmeasured fashion, and can begin in the bass, treble, or middle, proceeding in any direction or combination of directions. Most commonly, the chord is broken upward from the bass.

Directions include NOTATIONS of upward or downward direction, and the words "arpeggiare" or "arpeggiando" for an entire passage, often with the first chord written out. Girolamo FRESCOBALDI wrote in 1615 that "the beginnings of the toccatas are to be taken *adagio* and *arpeggiando*; and likewise with suspensions."

FRANCES CONOVER FITCH

Bibliography

Anglebert, Jean-Henri d'. *Pièces de Clavecin*. Paris, 1689. Reprint, ed. Kenneth Gilbert. Le Pupitre 54. Paris: Heugel, 1975.
Chambonnières, Jacques Champion de. *Pièces de Clavessin*. Paris, 1670. Reprint, ed. Thurston Dart. Monaco: Oiseau Lyre, 1969.
Perrine. *Livre de musique pour le lut, contenant une métode nouvelle et facile pour aprendre à toucher le lut sur les notes de la musique*. Paris, 1680. Facs. ed., Geneva: Minkoff, 1973.
Pesenti, Martino. *Il secondo libro delle correnti alla francese per sonar nel clavicembalo*. Venice: Vincenti, 1630.
Saint Lambert, Monsieur de. *Les Principes du Clavecin*. Paris, 1702. Facs. ed., Geneva: Minkoff, 1974. Trans. and ed. Rebecca Harris-Warrick as *Principles of the Harpsichord*. Cambridge: Cambridge University Press, 1984.
Türk, Daniel Gottlob. *Clavierschule, oder Anweisung zum Clavierspielen für Lehrer und Lernende* (Leipzig and Halle, 1789). Trans. and ed. Raymond H. Haggh as *School of Clavier Playing*. Lincoln: University of Nebraska Press, 1982.
Williams, Peter. "The Harpsichord Acciaccatura: Theory and Practise in Harmony, 1650–1750." *Musical Quarterly* 54 (1968): 503.

ARPICEMBALO

The term for the harpsichord commissioned by Grand Prince Ferdinando de' MEDICI of Florence in 1698 from Bartolomeo CRISTOFORI for the jubilee celebrations of 1700; also spelled *arpicimbalo*. It was to be capable of producing gradations of dynamics by finger pressure alone. Although no longer surviving, it is described in the inventory of Ferdinando's instruments of 1700 as having hammers. It may therefore be regarded as the first true pianoforte.

See also **Gravicembalo col piano e forte**

DAVID LEIGH

ARPICHORDUM

A stop usually found in Flemish virginals of the early seventeenth century, consisting of a thin lath upon which metal hooks shift under the strings on the lower half of the compass (usually C/E–f^1). When the strings are put in vibration they jar the hook and produce a buzzing sound. Michael PRAETORIUS mentions this stop and calls it *Harfenzug* (harp stop). In Flemish virginals this stop is apparently only found in MUSELARS (virginals with the keyboard to the right) and not on *vierkanten* (normal virginals).

FERDINAND J. DE HEN

Bibliography

Leonhardt, Gustav. "In Praise of Flemish Virginals of the Seventeenth Century." In *Keyboard Instruments: Studies in Keyboard Organology 1500–1800*, ed. Edward M. Ripin. Edinburgh: Edinburgh University Press, 1971. Reprint, New York: Dover, 1977.
Praetorius, Michael. *Syntagma Musicum*, vol. 2, *De Organographia*, Wolfenbüttel, Germany: Elias Holwein, 1618, 2/1619. Trans. Harold Blumenfeld as *De Organographia: First and Second Parts*. Kassel, Germany: Bärenreiter, 1962. Reprint, New York: Da Capo Press, 1980. Trans. and ed. David Z. Crookes as *De Organographia: Parts I and II*. Oxford: Oxford University Press, 1986.

ARPITARRONE

An instrument invented by Adriano BANCHIERI. In the 1611 edition of *L'organo suonarino* (1605), he describes how he heard the *arpicordo leutato* in Milano and commissioned the same builder, Michel de Hodes Francese, to construct an instrument combining the qualities of the *chittarone* (large guitar), the harp, and the *arpicordo* (ARPICHORDUM). The range of C/D–f^2 corresponds to

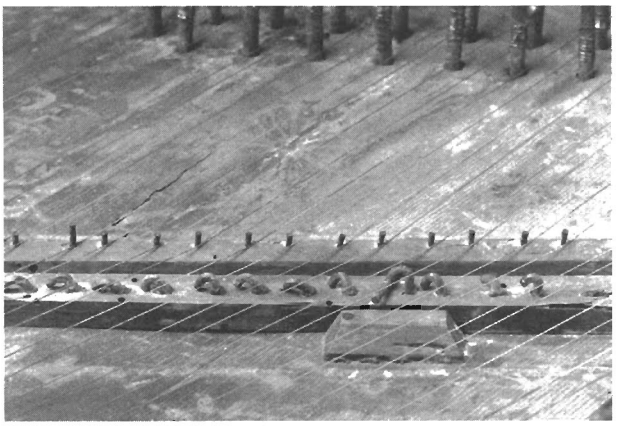


Fig. 4. Arpichordium from virginal by Andreas Ruckers the Elder, 1610 (detail).Leslie Lindsey Mason Collection. Courtesy of the Museum of Fine Arts, Boston.

that of human voices; the accidentals used are C♯, E♭, F♯, G♯, and B♭. The string material is unnamed.

LUCY HALLMAN RUSSELL

ARTICULATION

Varying the relation between the actual sounding part and the rhythmical value of a note is one of the most important means of playing expressively on any keyboard instrument. Articulation can substitute for DYNAMICS on instruments with limited dynamic flexibility. It can shape musical motives distinctively and underline the character of music.

The quasi-dynamic effect of articulation results from the fact that a note will be perceived as comparatively loud when the ratio between its sounding part and its nonsounding part ("articulation pause") is high. Holding the notes longer than their rhythmical value (OVERLAPPING LEGATO) yields maximum sound from stringed keyboard instruments; the application of this principle, however, is limited to special musical contexts—for example, broken chords. In other contexts, especially in conjunct melodic lines, the conflicting principle of clear articulative pronunciation becomes predominant, according to which a melodic line will be best brought to the listener's attention if played with small articulation pauses between its notes. In this way the notes are held rather long but can also be clearly discerned by the ear. Comparable to the clear pronunciation of consonants in singing, this second principle of articulation gives the performance a "speaking" quality.

As the clavichord has the possibility of dynamics, articulation on that instrument is not essential for the purpose of creating dynamic changes. In fact, the range of articulation has to be kept smaller than on the harpsichord because a very short staccato TOUCH cannot produce a proper string vibration. Consequently, a clavichordist should limit articulative variety for the sake of beauty of sound.

Before 1700 articulation was seldom indicated in keyboard scores. It was guided by conventions that were never expressly and clearly stated but could be inferred from occasional remarks by different authors; from factors like accentuation and playing technique that influence articulation; and from the fully developed articulation system to be found in the important treatises of the second half of the eighteenth century. After 1700, articulation signs occur more frequently. They may indicate either exceptions from the rules or a choice between several equally possible solutions. This ambiguity makes it impossible to deduce a system of articulation from practical sources alone without knowing the conventions.

Following the systematic approach of some of the treatises, articulation principles will be discussed according to four classifications: (1) articulation indicated by notational signs; (2) basic articulation; (3) differentiation of the basic articulation; and (4) group articulation.

Articulation Indicated by Notational Signs

Legato. The slur indicating legato was first introduced into keyboard NOTATION by Samuel Scheidt as "imitation violistica" (*Tabulatura nova*, 1624). Legato is usually defined as holding the notes for their entire rhythmical value. According to Monsieur de SAINT LAMBERT (1702, ch. 7) and later writers, a slur may also indicate overlegato, by which all notes of a broken chord covered by a slur should be held until the end of the slur, whereas in a conjunct melodic line (mostly descending) only the first note under the slur need be held. Overlegato is often used for SUSPENSIONS (see the ornament table in Jean-Phillipe RAMEAU's *Pièces de clavecin*, 1724). Particularly in late Baroque German sources, slurs over more than three notes may not concern articulation. Many slurs over four notes and most slurs over more than four notes indicate ACCENTS, following the rule that only the first note under a slur is to be accentuated. This accords with the statement in Tosi's influential singing method that legato seldom extends over more than four notes.

Staccato. Staccato signs were first introduced into keyboard notation in Jean-Henri d'Anglebert's *Pièces de clavecin* (1689). D'Anglebert used hooks; between 1700 and 1750 vertical strokes and, later, dots were preferred. For several decades staccato was demonstrated only in ornament tables that defined it as holding the notes through half of their rhythmic value, a practice followed by all the early and many later verbal descriptions. More precise writers, like Carl Philipp

Emanuel BACH, require holding notes for less than half their value. Only François COUPERIN (ornament table, *Pièces de Clavecin*, 1713) demands that a staccato note be held for three quarters of its value.

Basic Articulation

As Daniel Gottlob TÜRK (ch. 6, § 40) has noted, "For notes which are to be performed in the ordinary way, that is neither legato nor staccato, one raises the finger from the keys a little earlier than the duration of the note necessitates." Because such tiny articulation pauses are independent from the note values, they are evidently intended for acoustic clarity. JOHANN SEBASTIAN BACH's students of the first and second generation (C. P. E. Bach, A. F. C. Kollmann, Petri, and Türk) advocate this articulation, Friedrich Wilhelm MARPURG calls it "ordentliches Fortgehen" ("basic procedure") and demands it for all places that are not marked legato or staccato.

Though this slightly detached basic articulation is never described before 1700, it is probably what is meant by Tomás de SANTA MARÍA (fol. 38v) when he warns that one note should not "step on the other's heel." It is also indispensable for playing most old music, particularly four-part polyphony, with authentic FINGERINGS. Though the French clavecinists (particularly Couperin and Rameau) started to use legato to a broad extent, a real legato-based technique was first developed by pianoforte players in the late eighteenth century. Since the time of Ludwig van BEETHOVEN, legato is the universally accepted basic keyboard articulation.

Differentiation of the Basic Articulation

With its articulation pauses of constant length, Marpurg's "ordentliches Fortgehen" is musically neutral, independent from the musical context. A really speaking articulation will use it only as a starting point, gaining musical relevance by deviating from it toward legato or staccato. The use of the whole spectrum of ratios between sounding and nonsounding parts of notes is determined by several factors, some of which influence the articulation of whole pieces or at least substantial parts of pieces, while others direct the articulation of smaller musical units like motives or measures. These factors are discussed below in order of their relative importance.

Accentuation. At least in theory, accentuation was the most important aspect of musical performance until the end of the Baroque era. On instruments with little dynamic flexibility, articulation helped to realize accents and was consequently subject to the rules of accentuation. Since accented notes have to be held longer than unaccented ones, they should be preceded by a comparatively long articulation pause that makes their attack clearly audible. Preeminent among the different sorts of accents is the grammatical accent which generates a hierarchy of notes in one measure. According to this system, a group of notes belonging to one beat of the measure should be played within one unit of articulation. Longer articulation pauses should separate the groups. Differentiation of articulation pauses between the corresponding groups is not sufficient to distinguish strong and weak beats. These and so-called pathetic accents can be underlined by touch and by a slight AGOGIC ACCENT, dwelling on the accented note, slurring it to the next note.

Though the system of grammatical accentuation is fully explained only in German sources after 1750 (notably Kirnberger, II, ch. 4), it is valid for music from earlier periods. G. Diruta (fol. 6r°) mentions "good" and "bad" (accented and unaccented) notes that are always grouped in pairs. Applied to a polyphonic structure where notes of different values coincide, this principle will result in an accent pattern that closely resembles the one described by late Baroque theory. The only significant difference is that a late Baroque musician would consider only the first note of a beat as "good" even when the beat contains four or more notes, whereas before 1700 the binary succession of "good" and "bad" notes took into account all note values, no matter how many notes were contained in a beat. This stylistic difference is reflected in corresponding fingering systems.

Note Values. While accentuation gives different articulative weight to consecutive notes, the following criteria affect a musical piece as a whole. The first concerns different note values. According to rules outlined by C. P. E. Bach (ch. 3, § 22) and by his pupil Johann Carl Friedrich Rellstab (*Anleitung für Clavierspieler*, Berlin, 1789), the smallest note value in a given type of measure (not counting occasional smaller notes of purely ornamental function) is treated with basic articulation. Notes of the second smallest value are usually held only for about half their rhythmic duration, while longer notes are again played with basic articulation. This system fits the high and late Baroque practice of expressing interesting melodic ideas mostly in notes of the second smallest value, which therefore have to be performed in the clearest possible way. Notes of this value—two of them usually constituting one beat of the measure—are the easiest to comprehend, perhaps because they roughly correspond to the two parts of the human heartbeat. This late Baroque articulation system, however, cannot be automatically applied to earlier music, as around 1600 the relationships among tempo, measure, and note

value were different. Composers of that period often notated important thematic material in longer note values, which consequently have to be articulated in a more individual way.

General Character of a Piece. Türk (ch. 6, §§ 43–51) gives the clearest survey of the influence of the mood of a composition on articulation. a bright and joyful character is emphasized by staccato articulation, while a somber and sad character is best expressed by more extensive use of legato.

Tempo Indications. As they reflect (and, originally, name literally) various musical characters, tempo indications influence articulation. Pieces in fast tempo should be played with shorter articulation than slow pieces. There are, however, many exceptions to this general rule. As examples, an allegro or elements of it may have a cantabile character and demand a corresponding articulation, while a French ouverture marked *grave* has to be performed with a rather sharp articulation. Dynamic ideas also play an important role: very short staccato notes in an allegro marked *forte* may not be substantial enough in sound.

Types of Mensuration. From Johann Philipp KIRNBERGER's theories the following equation can be abstracted: the smaller the denominator of the measure indication, the less detached the articulation should become. A piece originally written in ¢ will have to be performed with a lighter articulation (and usually less *forte*) if it is changed to **c**. Apart from possible tempo implications, this may be the most plausible explanation for the existence of versions in different types of measures of some of J. S. Bach's works.

Types of Melodic Progression. Many sources say that conjunct motion calls for a less detached articulation than disjunct motion. A frequent exception in keyboard music is broken chords not constituting significant motivic material but simple accompaniment, which may be articulated nearly legato (or sometimes even overlegato) in order to yield a fuller sound from the instrument.

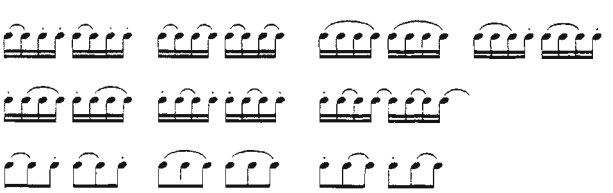
Acoustics. Harpsichordists and clavichordists sometimes confront the same situation frequently encountered by organists—that when the reverberation of the room is lively, the articulation must be more detached than in a smaller acoustical space.

Group Articulations

Articulation guided by accentuation already groups the notes, though only according to the metrical hierarchy of measure. It may have a monotonous effect if the performer does not know how to use its immanent possibilities with subtlety. Metrical articulation should be used in a discreet way so that a listener not intending to analyze performance details may only subconsciously notice the metrical effect of a regular succession of notes of different weight. If the performer wants the articulation to gain more individual interest, he must use contrasting and less subtle shades of staccato and legato. The following group articulations, cited in important treatises of the second half of the eighteenth century, are sometimes notated by the composers, but may also be used at the performer's discretion. Here they are arranged according to their approximate statistical frequency.

This list, derived from rather late sources (e.g., Leopold Mozart, *Violinschule*, ch. 6–7), must be used with caution when applied to Baroque music. Upbeat slurs were first used by violin soloists in the late Baroque. Wolfgang Amadeus MOZART was the first important keyboard composer who used them more than just occasionally. The typical dynamic effect of the genuine violin articulation of one staccato note followed by three slurred notes is lost on the harpsichord if the dynamically outstanding single note is simply played staccato; it should be held rather long, possibly with a slight agogic prolongation. Only the three first groupings from the list were common for music written before 1700. Most important and frequent is the second item because it fits the tendency of old scale fingerings to group the notes into pairs; to extrapolate upbeat slurrings from the fingering systems used by Girolamo DIRUTA and the early French clavecinists would be a mistake.

Besides the above-mentioned group articulations, the sources provide indications for the performance of dotted rhythms and ornaments. In dotted rhythms the notes are nearly always grouped in pairs, excepting only such French *pièces* as the musette or loure, which imitate nonarticulating instruments like the bagpipe or lyre. The general articulation in dotted rhythms varies widely according to musical character. A pronounced shortening of the longer note is suitable for pieces in lively tempo and for pieces in the French style with sharply dotted (or overdotted) rhythm, while in Italianate adagios the long note is more often slurred to the following short note. This soft articulation was also used by the French in pieces of tender character and mild inequality, though French fingerings even in such cases imply a small break after the long note. Couperin was the first to make frequent use of upbeat slurs in dotted rhythms, an articulation originally de-



rived from the *coulement de tierce*. In the inversely dotted "Lombard snaps" the short notes are always slurred to the following long ones.

Ornaments are generally played legato; this rule does not strictly apply to written-out ornaments in music before 1650, some of which may mildly be detached. Articulated playing of ornaments in late Baroque and early Classic pieces is occasionally possible for terminations of trills (the last note of the termination must always be separated from the following main note if no slur indicates otherwise) and turns. In the *Pralltriller* or *prallender Doppelschlag* of the German *galant* style the penultimate note has to be audibly separated from the last by a snap (*Schnellen*) of the finger (C. P. E. Bach, vol. 2, § 30).

The rule of slurring a suspension to its resolution is only partially valid for Renaissance music, but applies strictly to late Baroque and later music. As the resolution must be dynamically softer than the suspension, the performer should look carefully for written-out suspensions not marked by a slur (a frequent case with W. A. Mozart). In J. S. Bach's music such resolutions often even look like syncopations, thus misleading the performer to accentuate them.

See also **Accent; Chucking; Ornamentation; Phrasing; Touch**

LUDGER LOHMAN

Bibliography

Bach, Carl Philipp Emanuel. *Versuch über die wahre Art das Clavier zu spielen*. 2 vols. Berlin: G. L. Winter, 1753, 1762. Trans. and ed. William J. Mitchell as *Essay on the True Art of Playing Keyboard Instruments*. New York: W. W. Norton, 1949.

Couperin, François. *L'art de toucher le clavecin*. Paris: Foucaut, 1716, 1717. Facs. ed. New York: Broude Brothers, 1969. Facs. ed., Geneva: Minkoff, 1986. English/German trans. and ed. Mevanwy Roberts and Anna Linde. Leipzig: Breitkopf und Härtel, 1933. English trans. and ed. Margery Halford as *The Art of Playing the Harpsichord*. Port Washington, NY: Alfred, 1974.

Diruta, Girolamo. *Il Transilvano: Dialogo sopra il vero modo di sonar organi, et istromenti da penna*. Venice: author, 1593, 1612 (reset 1597, 1625). *Seconda Parte del Transilvano: Dialogo diviso in quattro libri*. Venice: author, 1609 (1610; reset 1622). Facs. of 1593 and 1622 eds. with introduction by Luisa Cervelli. Bologna: Forni, 1969. Facs. of 1593 and 1609 eds., ed. Peter Williams with introduction by Edward J. Soehnlein and Murray C. Bradshaw. Buren, Netherlands: Knuf, 1980. Trans. and ed. Murray C. Bradshaw and Edward J. Soehnlein as *The Transylvanian*. Henryville, PA: Institute of Medieval Music, 1984.

Faulkner, Quentin *J. S. Bach's Keyboard Technique*. St. Louis, MO: Concordia, 1984.

Kirnberger, Johann Philipp. *Die Kunst des reinen Satzes in der Musik*. 4 vols. Berlin: C. F. Voss, 1771; Berlin: G. J. Decker und G. L. Hartung, 1774, 1776–79. Facs. of 1776–79 ed., Hildesheim, Germany: G. Olms, 1968. Vol. 1 trans. David Beach and Jürgen Thym as *The Art of Strict Musical Composition*. New Haven, CT: Yale University Press, 1981.

Lohmann, Ludger. *Studien zu Artikulationsproblemen bei den Tasteninstrumenten des 16.–18. Jahrhunderts*. Regensburg, Germany: Bosse, 1982.

Marpurg, Friedrich Wilhelm. *Anleitung zum Clavierspielen*. Berlin: Haude und Spener, 1755, 1765. Facs. of 1765 ed., New York: Broude Brothers, 1969; Hildesheim: G. Olms, 1970. Trans. Elizabeth L. Hays as "F. W. Marpurg's 'Anleitung zum Clavierspielen' (Berlin, 1755) and 'Principes du clavecin' (Berlin, 1756)." Ph.D. diss., Stanford University, 1977.

Rameau, Jean-Philippe. "De la mechanique des doigts sur le clavessin," in *Pièces de clavecin*. Paris, 1724. Facs. ed., New York: Broude, 1967. Trans. and ed. Erwin R. Jacobi in *The Complete Theoretical Writings of Jean-Philippe Rameau*. 6 vols. [Middleton, WI]: American Institute of Musicology, 1967–72.

Saint Lambert, Monsieur de. *Les Principes du Clavecin*. Paris, 1702. Facs. ed., Geneva: Minkoff, 1974. Trans. and ed. Rebecca Harris-Warrick as *Principles of the Harpsichord*. Cambridge: Cambridge University Press, 1984.

Santa María, Tomás de. *Libro llamado Arte de tañer Fantasia*. Valladolid, Spain, 1565. Facs. ed., Geneva: Minkoff, 1973. Trans. Barbara Sachs and Barry Ife in *Anthology of Early Keyboard Methods*. Cambridge: Gamut, 1981. Trans. Julia Aranguren and Orpha Ochse as "How to Play with Complete Perfection and Excellence." *American Organist*, June, 1979, 30. Trans. ed. by Almonte C. Howell, Jr. and Warren E. Hultberg as *The art of playing the fantasia*. Pittsburgh, PA: Latin American Literary Review Press, 1991.

Tosi, Pierfrancesco. *Opinioni de' cantori antichi e moderni*. Bologna, 1723. Trans. J. E. Galliard as *Observations on the Florid Song*. London, 1742. German trans. Johann Friedrich Agricola as *Anleitung zur Singkunst*. Berlin, 1757. Facs. ed., Celle, Germany: Moeck, 1966.

Türk, Daniel Gottlob. *Clavierschule, oder Anweisung zum Clavierspielen für Lehrer und Lernende*. Leipzig, 1789. Trans. and ed. Raymond H. Haggh as *School of Clavier Playing*. Lincoln: University of Nebraska Press, 1982.

ATTWOOD, THOMAS (CA. 1765–1838)

English composer and keyboard player (chr. London, 23 Nov. 1765; d. London, 24 Mar. 1838). Despite his later accomplishments, Attwood is best known for having been a favorite pupil of Wolfgang Amadeus MOZART, with whom Attwood took lessons from 1785 to 1787 in Vienna. His exercises have survived, inclusive of Mozart's corrections. Included in them are tables of chromatic scales that seem to suggest an unequally tempered keyboard; they make the distinction between greater and lesser semitones and point out pitches available on other instruments, but not on the harpsichord.

See also **Chromatic; Irregular Temperament**

RUDOLF A. RASCH

Bibliography

Chesnut, John Hind. "Mozart's Teaching of Intonation." *Journal of the American Musicological Society* 30 (1977): 254–71.

Hertzmann, Erich. "Mozart and Attwood." *Journal of the American Musicological Society* 12 (1959): 178–84.
———, ed. "Thomas Attwoods Theorie- und Kompositionsstudien bei Mozart." *Wolfgang Amadeus Mozart: Neue Ausgabe Sämtlicher Werke.* Serie X, Supplement, Werkgruppe 30, Band 1. Kassel, Germany: Bärenreiter, 1965.
Oldman, Cecil B. "Thomas Attwood, 1765–1838." *Musical Times* 106 (1965): 844–45.

AUGEN-CLAVICEMBALO

Term used by Georg Philipp TELEMANN (alternatively, *Augenorgel*) for the *clavecin oculaire* of French mathematician LOUIS-BERTRAND CASTEL. Telemann's account, in Lorenz Christoph Mizler's *Musikalische Bibliothek* (1740), is in part a translation of Castel's description. The instrument apparently included a mechanism for displaying a different color for each note of the CHROMATIC scale; octave registers were differentiated by intensity.

DAVID SCHULENBERG

AUSTRALIA AND NEW ZEALAND

British colonies were not established in Australia and New Zealand until 1788 and 1840, respectively. It is not known if any HARPSICHORDS or CLAVICHORDS were imported into those regions during the nineteenth century. The handful of original (mostly English) harpsichords in Australian and New Zealand museums were acquired after 1900. In Australia, the first (modern) harpsichord played in public (Melbourne, late 1930s) aroused considerable interest in early music. Such instruments were imported for over thirty years.

One of the first Australian-made harpsichords (early 1960s) was an Italian single manual REPLICA built entirely from local materials. This instrument, the work of John BARNES, Frank HUBBARD, Raymond RUSSELL, and Martin Skowroneck, and recordings of original instruments have inspired most present-day makers to follow historical examples, despite some early support for modern, PRODUCTION-LINE INSTRUMENTS.

Working from purchased plans or measurements taken firsthand, Australians have produced a variety of handcrafted single- and double-manual harpsichords, VIRGINALS, SPINETS, and clavichords, representing all national schools, since the late 1960s. Materials used include Southern Hemisphere timber species—King Billy pine (soundboards), Tasmanian myrtle (cases, actions), New Zealand kauri (cases, framing)—as well as traditional European timbers. In addition, many imported KITS have been assembled.

Fig. 5. Single-manual Italianate harpsichord 2x8', GG to g''' by Mars McMillan, with a case of Tasmanian blackwood (veneer and solid). La Trobe University, Victoria, Australia.

As of the early 1990s, about fifteen full-time makers were active, including William Bright (Barraba, New South Wales), Alastair McAllister, Mars McMillan, and Marc Nobel (the so-called Melbourne school), and Richard Schaumloffel (Adelaide); plus a number of part-time enthusiasts. Each one has a particular specialty, philosophy, or ideal sound to contribute to the craft.

In New Zealand, imported instruments (some from Australia), assembled kits, and one full-time maker, Paul Downie (Auckland), have supplied local musicians since the 1970s.

MARS MCMILLAN

Bibliography

Atherton, Michael. *Australian Made . . . Australian Played.* Kensington: New South Wales University Press, 1990.

Fig. 6. Clavichord by Ferdinand Hofmann, Vienna, ca. 1795. Historisches Museum der Stadt Wien.

Bamber, R. K. "Musical Instruments from Australian Timber." *Australian Timber Journal* 30, no. 1 (1964): 33–37.
Heagney, Roger. "Melbourne: City of Harpsichord and Musical Instrument Makers." *Journal of the Institute of Catholic Education* 5 (1984): 36–43.
Steele, Mary. "Handmade in 9 Months." *This Australia* 5, no. 2 (1986): 27–31.

AUSTRIA

In Austria—including countries once part of the former Hapsburg Empire—the clavichord and harpsichord were in use as early as the fourteenth century, and there was a long tradition of innovation and development that lasted until the beginning of the nineteenth century. KEYBOARD instruments were built primarily by organbuilders in an atmosphere of creative tension between innovation and conservative tradition. A document from 1397 names Hermann POLL of Vienna as inventor of the CLAVICYMBALUM. Poll was physician and court astrologer and stood in the same tradition as Henri ARNAULT DE ZWOLLE. In 1418 the monks of Seckau (Styria) were allowed to play the clavichord. In 1438 and 1442, expenses "pro clavichordio" appear in the account books of the Klosterneuburg monastery near Vienna.

Harpsichord and clavichord building stood in a close connection with the profession of the organbuilder, who was named "Orgel- und Instrumentmacher." (Such building traditions extended over the borders of the country far into the territories of the former Holy Roman Empire, long ruled by the Hapsburgs.) The study of the appearance, significance, and use of sixteenth- and seventeenth-century clavichords depends on iconographic and written sources. On a woodcut by Hans Burgkmair from 1516, showing emperor Maximilian I (1459–1519) as the "Weisskunig," the only visible stringed keyboard is a large clavichord. In 1519 the purchase of a second PEDAL clavichord made by the organbuilder Georg Hacker of Steyr is mentioned in the chronicle of the Kremsmünster cloister.

A few signed and dated clavichords are preserved from the eighteenth century. They are generally characterized by conservative peculiarities in COMPASS (SHORT OCTAVE or BROKEN OCTAVE), STRING LENGTHS, fretting system, and CASE construction, which make the instruments sometimes appear to be more than fifty years older than their actual provenance (e.g., Graz, Anton Römer, 1774, now Kunsthistorisches Museum, Vienna). The fretting system often follows modified MEANTONE TEMPERAMENTS, in use in rural Austrian organs until about 1830. The clavichord was primarily an instrument for scholars, organists, and composers. The large unfretted clavichords, which became dominant in North Germany and Scandinavia in the middle of the eighteenth century, seem to have been exceptional in Austria.

Another unfretted clavichord, with a range of F–f^3, was built in 1794 by the Bohemian organbuilder Johann BOHAK for Joseph HAYDN (Royal College of Music, London).

At the end of the eighteenth century, the clavichord was thrust aside by the fortepiano, but a small circle of amateurs maintained an interest in this subtle instrument. For example, Daniel Gottlob TÜRK recommended in his *Lehrbuch im Klavierspielen* (Vienna, 1803) that the clavichord, rather than the fortepiano, be used for the education of children.

The union of organ- and harpsichord builder is documented by the fact that, among the earliest Austrian quilled keyboard instruments, there are several CLAVIORGANA (Tyrol, anonymous, ca. 1580, now Kunsthistorisches Museum, Vienna; Innsbruck, Josua POCKH, 1591, now Dommuseum, Salzburg; Linz, Valentin ZEISS, 1639; now Museum Carolino-Augusteum, Salzburg; Linz, Valentin Zeiss, 1646, now private collection). Michael PRAETORIUS in his *Syntagma musicum* mentions an enharmonic harpsichord with nineteen keys per octave, made about 1590 in Vienna.

Under Emperor Leopold I (r. 1658–1705), the Viennese court chapel was said to be the most famous in the world. Although the chapel was dominated by Italian musicians and composers, using Italian instruments, direct influence on Austrian instrument building is barely perceptible. The few preserved harpsichords show more parallels to Central and South German building traditions.

As early as 1676, the compass F–f^3 appears in a manuscript by Alessandro Poglietti, who seems to indicate that, in the bass, only the diatonic notes were included. This special form of the short octave can be found in a harpsichord by Johann LEYDECKER (Vienna, 1755, now Museum Johanneum, Graz), among others. Haydn must have been using such an instrument for his early compositions (e.g., the "Sauschneider-Capriccio," Hob. XVII: 1), as some left-hand chord positions are practical only with such a keyboard. At the beginning of the nineteenth century, the harpsichord was still used for operatic continuo playing. The latest preserved historical instrument is a spinet by Christoph Bock (Vienna, 1804, now Kunsthistorisches Museum, Vienna).

Since the early 1970s, the early music movement has inspired Austrian instrument builders to reconstruct harpsichords and clavichords (e.g., the Kanzler family, Graz; Peter Kukelka, Karnabrunn). In 1990, four officially recognized workshops were involved in traditional instrument building: Reinhold Humer, Ried; Richard Koch, Langenlebarn; Arno Pechstein, St. Marienkirchen; and Martin Pühringer, St. Peter/Wimberg.

ALFONS HUBER

Bibliography

Birsak, Kurt. "Salzburger Klaviere." *Museum Carolino Augusteum Jahresschrift* 34 (1988): 8–176.

Boalch.

Haupt, Helga. "Wiener Instrumentenbauer von 1791–1815." In *Studien zur Musikwissenschaft*. Vol. 24. Hildesheim: G. Olms, 1960.

Howell, Stanley. "Medical Astrologers and the Invention of Stringed Keyboard Instruments." *Abstracts of the 54th Meeting of the American Musicological Society in Baltimore, Maryland, November 1988*. Philadelphia: American Musicological Society, 1989.

Kellner, Altmann. *Musikgeschichte des Stiftes Kremsmünster*. Kassel, Germany: Bärenreiter, 1956.

Kraus, Gottfried, ed. *Musik in Österreich*. Vienna: C. Brandstätter, 1989.

Luithlen, Victor. *Saitenklaviere*. Führer durch das Kunsthistorische Museum 14. Vienna: Kunsthistorisches Museum, 1966.

Neupert, Hanns. *Das Klavichord*. Kassel, Germany: Bärenreiter, 1948. Trans. Ann Feldberg as *The Clavichord*. Kassel, Germany: Bärenreiter, 1968.

Stradner, Gerhard. *Musikinstrumente in Grazer Sammlungen*. Tabulae Musicae Austriacae 11. Vienna: Österreichische Akademie der Wissenschaften, 1986.

Walter, Horst. "Das Tasteninstrument beim jungen Haydn." In *Der junge Haydn: Kongressbericht Graz 1970*. Schriftenreihe des Instituts für Aufführungspraxis der Hochschule für Musik. Graz, Austria: Akadem. Druck-u. Verlagsanst, 1972.

B

BACH, CARL PHILIPP EMANUEL (1714–1788)

German composer, keyboard player, theorist, and writer (b. Weimar, 8 Mar. 1714; d. Hamburg, 14 Dec. 1788). Second surviving son of JOHANN SEBASTIAN BACH, C. P. E. Bach was court harpsichordist to FREDERICK II, KING OF PRUSSIA, at Berlin and Potsdam (1740–67) and director of church music in Hamburg (1768–88). He is the chief representative of a North German school of composition and keyboard playing that flourished in the second half of the eighteenth century. His *Versuch über die wahre Art das Clavier zu spielen* (1753) is fundamental for information on German musical practices of the period.

The Essay

The *Versuch* was originally published in two volumes. The first deals with solo playing: FINGERING, ORNAMENTATION, and performance in general. Published in conjunction with this volume were eighteen *Probestücke* ("examination pieces"), which were actually six three-movement sonatas of increasing musical and technical sophistication whose scores include comprehensive performance indications and fingerings. The second volume deals with ACCOMPANIMENT—that is, the realization of FIGURED BASS and the performance of CONTINUO parts—as well as the closely allied art of improvisation. In addition to discussing the many chord symbols systematically used in the basso continuo parts of his ensemble works, Bach explains the modifications of a normal continuo realization necessary for refined accompaniment in *galant* chamber music. The final chapter teaches improvisation as an embellished form of figured bass realization, demonstrating how to create a short free fantasia from a figured bass line.

The *Versuch* indicates that the harpsichord is Bach's instrument of choice for accompanying and directing large ensembles, where it would have served as the main continuo instrument. But he prefers the fortepiano or clavichord when a refined accompaniment is desired, noting, however, that some singers preferred clavichord or harpsichord to the fortepiano (II, intro. 6; references herein to the *Versuch* cite volume, chapter, section, and, where appropriate, paragraph numbers). This reflects Bach's extensive practical experience not only as a keyboard soloist but in collaborations with other musicians, including singers, in the intimate private concerts of the Prussian royal court and in large-scale public performances at the Berlin Opera and elsewhere. Bach's sacred music, most of which dates from his Hamburg period (after publication of the *Versuch*), appears to have employed organ alone as the continuo instrument.

In the *Versuch* Bach describes the clavichord as the most demanding instrument, the one "on which a keyboard player can best be judged" (I, intro. 11) and on which one learns a sensitive TOUCH. He particularly praises the clavichord's unique capabilities for BEBUNG and TRAGEN DER TÖNE (PORTATO). Nevertheless, he urges players to own both harpsichord and clavichord and to play "on both instruments all sorts of pieces interchangeably" (I, intro. 15). Moreover, on both instruments he demands an even action, neither too light nor too stiff, and KEYS that do not "fall too deeply" (I, intro. 12–13). Either instrument must be "well

tempered" (*gut temperirt*), but whether this means EQUAL TEMPERAMENT is unclear: "most" of the fifths (*die meisten Quinten*) are tempered, yet all twenty-four tonalities are "equally pure" (*gleich rein*; I, intro. 14). BARTHOLD FRITZ, in a treatise on equal temperament (*Anweisung, wie man Claviere, Clavecins, und Orgeln . . . gleich rein stimmen könne*, 1757), declared that Bach had written to him that Fritz's treatise said "all that was necessary and possible" on the subject. Since this claim occurs in the volume's dedication to Bach himself, who is not known to have disavowed it, this can be taken as conclusive evidence for Bach's preference at the time.

Bach may at first have regarded the fortepiano, in regular use by 1747 as a continuo instrument at the Berlin court, as useful primarily for accompaniment. Volume I of the *Versuch* notes the difficulty of regulating the action (*Tractirung*; I, intro. 11) and playing certain ornaments (I, 2.3.36) on the fortepiano. But in volume 2 Bach names the fortepiano alongside the clavichord as the best instrument for the performance of fantasias—for Bach the most elevated musical genre—praising especially the fortepiano's "undamped register" (II, 41.4; *Register* probably refers to a HAND STOP that lifted all the DAMPERS).

By the time he was writing the *Versuch*, Bach evidently regarded the harpsichord as not fully adequate for the performance of contemporaneous music. But he clearly expected and countenanced its use, and the *Versuch* describes compromise procedures for dealing with DYNAMICS, no doubt based on practical experience. In solo music Bach counsels harpsichordists to observe only dynamic indications that apply to "whole passages" (II, 3.29), omitting ACCENTS and sudden changes of dynamic level on individual notes. In continuo playing, dynamic contrasts are produced by varying the number of parts in the realization (including doublings) and by using prescribed combinations of "louder" and "softer" manuals (II, 29.5–7).

Although Bach's music is no longer thought to have exerted much direct influence on Joseph HAYDN or Ludwig van BEETHOVEN, both composers reportedly recommended Bach's *Versuch* to pupils. The treatise remains one of the most frequently consulted sources on historical performance practice. Several oft-cited passages advocate expressive playing, prescribing flexibility of tempo (II, 3.28) and an emotive approach to performance (II, 3.13). But Bach also insisted on faithfulness to the score and complete technical proficiency, including clear and precise performance of ornaments. He credited J. S. Bach with inventing the modern type of fingering, in which extensive use is made of the thumb (I, 1.7), and he reports that his own pupils studied his father's figured basses (II, 1.5). Yet although he acknowledged J. S. Bach as his only teacher, the *Versuch*'s point of reference is C. P. E. Bach's own music and that of other North German composers at the mid-eighteenth century. Existing editions and translations of the *Versuch* are neither complete nor entirely reliable (a project to publish the composer's complete works was launched in 1999, following an aborted effort begun in the 1980s).

The Keyboard Music and its Performance

There are two catalogs of Bach's music (Wotquenne, 1905; Helm, 1989). Although he composed in all important forms of his time (except opera), Bach is now best known for his works for solo keyboard, in particular the roughly 150 sonatas. About half of these were published during his lifetime, appearing in such collections as the "Prussian" and "Württemberg" sonatas (published 1742 and 1744, respectively), the aforementioned *Probestücke*, and six sets bearing the subtitle *für Kenner und Liebhaber* (1779–87). These sets also contain fantasias and a special type of rondo. Of Bach's works for instrumental ensemble, the most important are the fifty-two concertos for one or two keyboard instruments and strings (some with optional winds as well). There are also twelve multimovement lighter pieces, which Bach termed *sonatinas*, for one or two keyboard instruments with orchestra. Smaller chamber works include about thirty duos and trios for solo keyboard instrument with string or wind instruments, as well as some 100 lieder for voice and keyboard. Keyboard instruments are also required for the carefully notated basso continuo parts included in virtually all of Bach's other ensemble works.

Although the influence of J. S. Bach on some early works is palpable, C. P. E. Bach rarely emulated his father's contrapuntal approach, instead creating a personal version of the midcentury galant style. The resulting *empfindsamer Stil* (expressive manner) incorporated unusual melodic INTERVALS and irregularly placed rests as well as chromatic harmony and sudden remote modulations. Keyboard music of the so-called *Empfindsamkeit* is particularly suited to the clavichord, but by no means do all Bach's works fit this description, and both his compositional style and his treatment of the keyboard idiom show considerable variety and development during the long span covered by the keyboard works (1731–88).

In fact, few of Bach's keyboard works can have been intended for a specific instrument. Only a few pieces employ the composer's sign for BEBUNG, and these compositions are not specifically designated as clavichord works. The terms *cembalo* and *clavier*, used in the titles of numerous manuscripts and publications, are generic indications for any keyboard instrument. Within the *Versuch* Bach uses *Clavicord* and *Flügel* to

specify clavichord and harpsichord, respectively, but the former term never appears in his scores. One sonata (1747; W. 69, H. 53), includes Bach's REGISTRATIONS for a special two-manual harpsichord with four stops. Six easy concertos published in 1772 (W. 43, H. 471–76) were advertised as being intended particularly for the harpsichord—implying that the unpublished concertos of the period, presumably composed for Bach's own performances, were not. Indeed, newspaper reports indicate that at Hamburg Bach gave at least a few public performances of concertos and "solos"—evidently sonatas—on the fortepiano. The rondos *für Kenner und Liebhaber* are explicitly for fortepiano; these pieces juxtapose concerto-style passagework with expressive *empfindsamer* passages, hence combining the idioms of harpsichord and clavichord. The double concerto in E♭ (1788; W. 47, H.479) calls for both fortepiano and harpsichord (*Fortepiano, Flügel*) but differentiates between the two instruments only minimally, in the last movement. There is also a sonata (1783; W. 65/48, H. 280) for *Bogenclavier* (BOGENFLÜGEL), a bowed keyboard instrument mentioned enthusiastically in the *Versuch* (II, intro. 2), but the work does not contain any distinctive keyboard idioms or markings.

Although Bach evidently expected his keyboard works to be played on any available instrument, growing preference for the clavichord or fortepiano is evident from the increasing number and precision of dynamic markings over his career. Already in the Prussian Sonatas he calls for three dynamic levels, and later works indicate diminuendos, crescendos, and accents through closely spaced fortes and pianos. The keyboard COMPASS also widens; the earliest pieces rarely exceed four octaves (C–c^3), but the range GG–e^3 had become Bach's norm by the mid-1740s, a full five octaves (FF–f^3) by 1765.

There is also a gradual evolution away from the strictly polyphonic texture in two or three voices that characterizes his earliest pieces. From the 1750s onward, Bach's figuration is more idiomatic to the clavichord or fortepiano than to the harpsichord, including passages in octaves and other devices now regarded as pianistic. Among these are the quiet opening of the E-minor sonata (1758; W. 52/6, H. 129) and the decrescendo coupled with an ascent into the upper register at the end of the A-major sonata (1758 or later; W. 65/32, H. 135). Yet throughout his career Bach uses multivoiced textures only in *forte* passages or for accents, a holdover from harpsichord or organ writing. He also avoids accompaniments of the Alberti-bass type, although drum-basses occur frequently, similar to those found in his orchestral works. His basic approach to keyboard touch and ARTICULATION (the latter discussed in the *Versuch*, I, 3.17–18) appears to have remained constant throughout his life, to judge from his use of slurs, which rarely cover more than a few notes or extend over a barline. Staccato strokes usually seem to imply accentuation in addition to separation. These are to be distinguished from dots, which normally occur only on a series of notes in conjunction with a slur, as in the Tragen der Töne, implying a dynamic impulse on each note, not an abbreviation.

Several writers, including Charles BURNEY, left descriptions of Bach's performances on the SILBERMANN clavichord, noting the instrument's unusually wide dynamic range and sustaining power. Contemporary accounts also describe Bach's fortepiano playing. But his clavichords were evidently powerful enough for use in what we would call piano trios; a Hamburg newspaper report of 1777 describes his performing the accompanied sonatas W. 91/1–4 (H. 531–34) on his clavichord (a five-octave instrument built by Christian Ernst FRIDERICI) with a muted violin and a cello "played with discretion." Bach's clavichords must have been unfretted, otherwise much of his highly CHROMATIC music would have been unplayable.

Beginning in the 1740s Bach must also have played Frederick II's Silbermann fortepianos, as well as two famous harpsichords now in Charlottenburg. He may even have advised on the extension of the range of the latter instruments, which now reach the note e^3 as recommended in the *Versuch* (I, intro. 12). Although Bach neglected the organ—he told Burney that through lack of practice he had "lost the use of the pedals"—he evidently presented a set of manualiter sonatas (W. 70/1–6; H. 133–34, 84–87) to Princess Anna Amalie, Frederick II's sister, who owned a chamber organ. But the pieces are playable on any keyboard instrument; only the *Preludio* (W. 70/7, H. 107) includes a simple pedal part.

At his death, according to the 1790 estate catalog, Bach owned a five-octave clavichord by Heinrich Wilhelm Jungcurt and a five-octave harpsichord by an unidentified maker. He also owned two instruments by Friderici: the aforementioned clavichord, on which Bach composed most of his Hamburg compositions, and a fortepiano. In a letter to Johann Nicolaus FORKEL (10 November 1773), Bach explains that he prefers the action (*Tractament*) of Friderici's clavichords over those of Fritz and Johann Adolph HASS; he also "cannot bear" the octave doublings of the bass strings on Hass' clavichords. Bach's most famous instrument was the Silbermann clavichord that he acquired about 1746; its sale in 1781 provoked him to compose the rondo (W. 66, H. 272) that bears the title *Abschied von meinem Silbermannischen Claviere* ("Farewell to my Silbermann clavichord").

See also **Concerto; Fingering; Hohlfeld, Johann; Thumb, Use in Playing**

DAVID SCHULENBERG

Bibliography

Bach, Carl Philipp Emanuel. *Versuch über die wahre Art das Clavier zu spielen*. 2 vols. Berlin: G. L. Winter, 1753, 1762. Reprint, ed. Lothar Hoffmann-Erbrecht. Leipzig: Breitkopf und Härtel, 1957. Reprint, ed. Wolfgang Horn. Kassel, Germany: Bärenreiter, 1994. Trans. and ed. William J. Mitchell as *Essay on the True Art of Playing Keyboard Instruments*. New York: W. W. Norton, 1949.

Berg, Darrell. "C. P. E. Bach's Organ Sonatas: A Musical Offering for Princess Amalia." *Journal of the American Musicological Society* 51 (1999): 477–519.

———, ed. *The Collected Works for Solo Keyboard by Carl Philipp Emanuel Bach (1714–1788)*. 6 vols. New York: Garland, 1985.

Clark, Stephen L., ed. *C. P. E. Bach Essays*. Oxford: Clarendon Press, 1988.

———, trans. *The Letters of C. P. E. Bach*. Oxford: Clarendon Press, 1997.

Helm, E. Eugene. *Thematic Catalogue of the Works of Carl Philipp Emanuel Bach*. New Haven, CT: Yale University Press, 1989.

Ottenberg, Hans-Günter. *Carl Philipp Emanuel Bach*. Trans. Philip Whitmore. Oxford: Oxford University Press, 1987.

Schulenberg, David. *The Instrumental Music of Carl Philipp Emanuel Bach*. Ann Arbor, MI: UMI Research Press, 1984.

———. "'Toward the Most Elegant Taste': Developments in Keyboard Accompaniment from J. S. to C. P. E. Bach." In *The Keyboard in Baroque Europe*, ed. Christopher Hogwood. Cambridge: Cambridge University Press, 2003.

———. "When Did the Clavichord Become C. P. E. Bach's Favourite Instrument? An Inquiry into Expression, Style, and Medium in Eighteenth-Century Keyboard Music." *De clavicordio IV: Proceedings of the IV International Clavichord Symposium, Magnano, 8–11 September 1999*, ed. Bernard Brauchli, et al. Magnano, Italy: Antica a Magnano, 2000.

Suchalla, Ernst, ed. *Carl Philipp Emanuel Bach: Briefe und Dokumente: Kritische Gesamtausgabe*. 2 vols. Göttingen, Germany: Vandenhoeck und Ruprecht, 1994.

Wotquenne, Alfred. *Thematisches Verzeichnis der werke von Carl Philipp Emanuel Bach*. Leipzig: Breitkopf und Härtel, 1905. Reprint, Wiesbaden: Breitkopf und Härtel, 1964.

BACH, JOHANN NICOLAUS (1669–1753)

German composer, organist, and instrument builder (b. Eisenach, 10 October 1669; d. Jena, 4 November 1753). He was the eldest son of Johann Christoph Bach and second cousin of JOHANN SEBASTIAN BACH. A minor composer who was greatly influenced by Antonio Lotti, J. N. Bach's music is both melodious and competent. He is better remembered for teaching J. S. Bach the organ, and for his undoubted practical experience in the construction of keyboard instruments, including pipe organs. Above all he was the inventor of the *Lautenclaviere* (LUTE-HARPSICHORD), an instrument that combined the tone of the lute with a keyboard action (not to be confused with the LUTE STOP later developed for the harpsichord and in connection with gut stringing). Created when Bach was working in Jena, the exact mechanism of his LUTE-HARPSICHORD is unknown. The precise date of this invention is critical if he is to be credited with inventing the first of several similar instruments of this period, but the nearest one may say is that it occurred between 1690 and 1732. It was while he was at Jena that he met and befriended then student Jacob ADLUNG, who was greatly impressed by this instrument. J. S. Bach's request for a lute-harpsichord, made for him by the organbuilder Zacharias HILDEBRANDT and seen by Adlung in Leipzig around 1740, is thought to be merely coincidental.

ARTHUR W. J. G. ORD-HUME

Bibliography

Adlung, Jacob. *Musica mechanica organoedi*. Ed. J. L. Albrecht and J. F. Lorenz. Berlin: F. W. Birnstiel, 1768. Reprint, ed. by Christhard Mahrenholz. Kassel, Germany: Bärenreiter, 1931.

BACH, JOHANN SEBASTIAN (1685–1750)

German composer and organist (b. Eisenach, 21 Mar. 1685; d. Leipzig, 28 July 1750). Little documentation about Bach's personal keyboard instruments has come down to us. The inventory of his estate includes one "veneered harpsichord, which if possible [was] to remain in the family," two more harpsichords, one smaller harpsichord, a little SPINET (*spinettgen*), and two LUTE-HARPSICHORDS. The accounting of the distribution of Bach's estate mentions a lifetime gift of three *claviers* together with a PEDALBOARD to his youngest son, Johann Christian Bach. This was likely a two-manual and pedal clavichord, an instrument commonly used by organists for practice at home.

Bach expressed critical interest in Gottfried SILBERMANN'S earliest pianofortes, and while praising their TONE, found fault with the heavy TOUCH and weak treble. Silbermann, although wounded, took Bach's criticism to heart and worked to improve the instruments. Bach played on several of these later instruments at the court of FREDERICK II, KING OF PRUSSIA, at Potsdam in 1747 and commended them. A receipt dated 1749 in Bach's hand shows that he subsequently acted as an agent for Silbermann's pianofortes.

In 1719 Bach was dispatched to Berlin to buy and bring back a very costly large harpsichord by Michael MIETKE for the Cöthen court. Two harpsichords in Berlin (Schloss Charlottenburg), although unsigned, are believed to have been made by Mietke. It is unlikely that Bach personally could have afforded an instrument by this eminent maker but he surely was consulted regarding the purchase and would have played the harpsichord in the line of duty. The so-called BACH HARPSICHORD (Musikinstrumenten-Museum, Berlin,

no. 316) has been shown to have no connection with J. S. Bach whatsoever.

Johann Nicolaus FORKEL's assertion—that "Bach liked best to play upon the clavichord" because the harpsichord, despite its resources, "had not enough soul for him"—should not be accepted uncritically. It reflects the outlook of the clavichord-centered *Empfindsamkeit* generation of CARL PHILIPP EMANUEL BACH, Forkel's principal source of information. In J. S. Bach's published keyboard works, he specifies a two-manual harpsichord for the French Overture (BWV 831) and Italian Concerto (BWV 971) in part 2 of the *Clavier-Übung* and the "Goldberg" Variations (BWV 988) in part 4. The autographs of the Inventions and Sinfonias (BWV 772–801) and the *Well-Tempered Clavier*, book 1 (BWV 846–869) use only the generic term *Clavier*, which also appears in the titles of two of the *Clavier-Büchlein* (little keyboard books): the 1722 collection for Anna Magdalena Bach and the 1723 volume for Wilhelm Friedemann Bach. (The 1725 *Clavier-Büchlein* for Anna Magdalena and the incomplete autograph of the *Well-Tempered Clavier*, book 2, are untitled.) Only one pair of fragmentary pieces by J. C. Richter in the 1723 Friedemann Bach book bears an instrumental designation: *Pièce pour le Clavecin*.

Each of Bach's first five "French" suites (BWV 812–16), which make up the bulk of the 1722 collection, is headed *Suite pour le Clavessin*. Is this apparent specification of the harpsichord as the medium of performance a binding directive or, rather, an example of the widespread vogue for French words in eighteenth-century Germany? The first two suites similarly headed appear in the 1725 *Clavier-Büchlein* but the early versions of the A-minor and E-minor partitas (BWV 827, 830) in this manuscript give titles only for the individual movements. (The only other piece in the 1725 collection with any instrumental designation is an early work of C. P. E. Bach, *Solo per il Cembalo* [BWV Anh. 129].) The partitas (BWV 825–30) published by Bach in 1726–1731 as part 1 of the *Clavier-Übung* bear only this generic instrumental designation. The all-inclusive nature of the word *Clavier* is clear from the fact that part 3 of the *Clavier-Übung* series consists exclusively of organ music.

In some of Bach's earliest keyboard music, e.g., the Capriccio in E (BWV 993) and the Sonata in D (BWV 963, both datable at ca. 1704), a brief PEDAL part occasionally appears. This does not mean unequivocally that the music was intended for performance on the organ. Rather, it may indicate the organ as an option or, more probably, that if a pedal keyboard were attached to the harpsichord or clavichord, as was frequently the case in the homes of organists, it could be used to play these outlying notes. The passages in question can invariably be adapted satisfactorily for performance without pedals.

To allow the performance of all of Bach's keyboard music, notably the *Clavier-Übung*, parts 2 and 4, a two-manual instrument disposed 2 × 8', 4' with COUPLER, possibly a BUFF STOP, and a RANGE of GG–d^3 is required. (The extension to f^3 in the harpsichord part of the Triple Concerto [BWV 1044] is one of several reasons for considering the work a late eighteenth-century arrangement of Bach's music.) The 16' register in harpsichords was always a relative rarity but it was certainly known to Bach. The long-held belief that the harpsichord was excluded from the CONTINUO group in Bach's church music has been refuted by recent research, establishing that both organ and harpsichord were regularly used in contemporaneous performance of Bach's cantatas.

However, much of the music can be interpreted effectively on much smaller instruments—for example, single-manual harpsichords disposed 8', 4', or 2 × 8', as well as on the clavichord. The clavichords of the period—simple, inexpensive, and primarily intended as first or practice instruments—often retained the old SHORT OCTAVE keyboard from C/E, extending upward to c^3 or a note or two higher. Even the smallest and simplest of them were invariably DOUBLE-STRUNG. The making of FRETTED clavichords continued beyond 1750, although the unfretted type (first mentioned in the preface to Johannes SPETH's *Ars Magni Consoni et Dissoni* of 1693, but surely developed somewhat earlier) were increasingly used during Bach's lifetime.

The lute-harpsichords of Bach's cousin JOHANN NICOLAUS BACH, in nearby Jena, were praised by Jacob ADLUNG as the best of all. Varieties of lute-harpsichord were also made by other famous German builders, including Johann Christoph FLEISCHER of Hamburg, who built the *Theorben-Flügel* (THEORBO-HARPSICHORD). At least one of the lute-harpsichords in Bach's estate would likely have been made by the Silesian organbuilder Zacharias HILDEBRANDT, who made one to Sebastian's specifications in 1740. Bach's lute-harpsichord had a shorter scale than conventional harpsichords, and was disposed with two 8' choirs of gut strings and a 4' register strung in BRASS.

HOWARD SCHOTT

Bibliography

Adlung, Jacob. *Anleitung zu der musikalischen Gelahrheit.* Erfurt, Germany: J. D. Jungnicol, 1758; 2d ed., 1783. Reprint, Rochester, NY: University of Rochester Press, 1957. Reprint, Kassel, Germany: Bärenreiter, 1953.

———. *Musica mechanica organoedi.* Ed. J. L. Albrecht and J. F. Lorenz. Berlin: F. W. Birnstiel, 1768. Reprint, ed. Christhard Mahrenholz. Kassel, Germany: Bärenreiter, 1931.

David, Hans T., and Arthur Mendel, eds. *The Bach Reader: A Life of Johann Sebastian Bach in Letters and Documents.* New York: W. W. Norton, 1945. Rev. ed., New York: W. W. Norton, 1966.
Dreyfus, Laurence. *Bach's Continuo Group: Players and Practices in His Vocal Works.* Cambridge, MA: Harvard University Press, 1987.
Ernst, Friedrich, *Der Flügel Johann Sebastian Bachs.* Frankfurt: C. F. Peters, 1955.
Forkel, Johann Nicolaus. *Über Johann Sebastian Bachs Leben, Kunst und Kunstwerke.* Leipzig: Hofmeister & Kühnel, 1802. Trans. and ed. by Charles Sanford Terry as *Johann Sebastian Bach, His Life, Art and Work.* London: Constable, 1920. Reprint, New York: Da Capo, 1970.
Germann, Sheridan. "The Mietkes, the Margrave and Bach." In *Bach, Handel, Scarlatti: Tercentenary Essays*, ed. Peter Williams. Cambridge: Cambridge University Press, 1985.
Marshall, Robert L. "Organ or 'Klavier'? Instrumental Prescriptions in the Sources of Bach's Keyboard Works." In *J. S. Bach as Organist*, ed. George Stauffer and Ernest May. Indianapolis: Indiana University Press, 1986.
Schott, Howard. "Clavichord: Eighteenth-Century Germany." In *The New Grove Early Keyboard Instruments*, ed. Stanley Sadie. New York: W. W. Norton, 1989.
Schulenberg, David. *The Keyboard Music of J. S. Bach.* New York: Schirmer, 1992.
Spitta, Philipp. *Johann Sebastian Bach.* Trans. Clara Bell and J. A. Fuller-Maitland. London: Novello, 1884.

BACH HARPSICHORD

An eighteenth-century German two-manual harpsichord owned by the Vob family in Berlin, patrons of Wilhelm Friedemann Bach, which was acquired by Paul de Wit, a dealer in antique musical instruments. Embellishing the description and provenance of the instrument given by Wilhelm Rust in volume 9 of the *Bachgesellschaft* edition of JOHANN SEBASTIAN BACH's works, de Wit claimed that the instrument had been Bach's very own. This fable was accepted by OSKAR FLEISCHER, who bought the instrument in 1890 for the Royal Collection in Berlin on the recommendation of Bach's biographer, Philipp Spitta. Although Georg Kinsky proved in 1924 that this harpsichord had no claim to association with Bach, the legend persisted and the instrument served as a model for modern German harpsichord production until the 1970s. The unsigned harpsichord (Musikinstrumenten-Museum, Berlin, no. 316) was first ascribed to Johann Heinrich HARRASS of Grossbreitenbach by Henkel, and is fully described in Krickeberg and Rase. Its presumed original idiosyncratic disposition, I: 16', 4'; II: 8' was altered early on to I: 16', 8'; II: 8', 4', which is musically impractical and certainly unhistorical.

HOWARD SCHOTT

Bibliography

Ernst, Friedrich. *Der Flügel Johann Sebastian Bachs.* Frankfurt: C. F. Peters, 1955.
Fleischer, Oskar. "Das Bach'sche Clavicymbel und seine Neukonstruktion," *Zeitschrift der I. M. G.* 1 (1899): 161–67.
Harich-Schneider, Eta. *The Harpsichord.* St. Louis, MO: Bärenreiter, 1954.
Henkel, Hubert. "Der Cembalobau der Bach-Zeit im sächsisch-en-thüringschen und im Berliner Raum," in *Bericht über die Wissenschaftliche Konferenz zum II. Internationalen Bach-Fest der DDR.* Leipzig: Deutscher Verlag für Musik, 1977.
Hubbard.
Kinsky, Georg. "Zur Echtheitsfrage des Berliner Bach-Flügels." *Bach-Jahrbuch* (1924): 128–38.
Krickeberg, Dieter, and Horst Rase. "Beiträge zur Kenntnis des mittel- und norddeutschen Cembalobaus um 1700," in *Studia Organilogica: Festschrift für John Henry van der Meer*, ed. Friedemann Hellwig. Tutzing, Germany: Hans Schneider, 1987.
Meer, John Henry van der, et al., eds. *Kielklaviere: Cembali, spinette, virginale.* Berlin: Staatliches Institut für Musikforschung, Preussischer Kulturbezitz, 1991.

BACK EIGHT

A REGISTER on a harpsichord having at least two 8' registers. "Eight" refers to the 8' pitch of the register, while "back" refers to the position of the SLIDE of the register, further from the player than the other 8' register. On a two-manual harpsichord, the back eight is of necessity operated from the lower manual. Generally speaking, the back eight plucks to the left, although there are exceptions. Occasionally, there are two back 8' registers, one being a PEAU DE BUFFLE.

See also **Front Eight**

MICHAEL LATCHAM

BACK PINS

(1) Pins positioned in the BRIDGE distally from, but close to, the BRIDGE PINS. The STRINGS pass to the left of the bridge pins and to the right of the back pins, which are placed at such an angle to ensure good side draft and good contact with the bridge. (2) Pins placed in the BACK RAIL of the keyboard FRAME used to guide the KEY LEVERS. They either emerge through mortices in the KEYS or are placed between adjacent keys.

See also **Hitchpin Rail**

MICHAEL LATCHAM

BACK RAIL

1. The JACK cross member of the keyboard FRAME. 2. The BATTEN mounted on top of the back guide, limiting the upward motion of the KEY LEVERS. This is usually a feature of the Flemish tradition.

MICHAEL LATCHAM

BACKERS, AMERICUS (FL. 1763–1781)

Harpsichord builder, probably of Dutch origin. By 1763, Backers, who probably worked for SILBERMANN, had come to London. Only one of his harpsichords survives (England, private collection); one SPINET, though ostensibly by HITCHCOCK, is signed "Backus No 8." Before his death, Backers, together with Robert STODART and John BROADWOOD, invented the English pianoforte ACTION, found in the surviving Backers grand fortepiano in the Russell Collection, Edinburgh, and also used by Broadwood in his pianos.

CHARLES MOULD

Bibliography

Boalch.

Newman, Sydney, and Peter Williams. *The Russell Collection and Other Early Keyboard Instruments in St Cecilia's Hall, Edinburgh*. Edinburgh: Edinburgh University Press, 1968.

BADER, PETER-DANIEL (CA. 1560–CA. 1636)

Dutch organ and harpsichord builder. Bader, active in Antwerp and in Arnsberg, founded an important organ-building dynasty. His admission into the Guild of St. Luke of Antwerp as *orgelmaker en clavecingelmaker van Duytslant* (organ and harpsichord maker from Germany) is documented in 1600. An overly restored VIRGINALS with a ROSE and the initials PDB is preserved in the Brussels Conservatory.

NICOLAS MEEÙS

Bibliography

Felix, J. P., and P. Roose. "Bader." In *Dictionnaire des facteurs d'instruments de musique en Wallonie et à Bruxelles du 9e siècle à nos jours*, ed. Malou Haine and Nicolas Meeùs. Liège, Belgium: P. Mardaga, 1986.

Rombouts, Philip, and Théodore van Lerius, eds. *De liggeren en andere historische archieven der antwerpsche Sint Lucasgilde*. 2 vols. Antwerp, 1864–76. Reprint, Amsterdam: Israel, 1961.

BAFFO, GIOVANNI ANTONIO (FL. 1570–1579)

Italian builder of harpsichords and VIRGINALS. Baffo worked in Venice, making instruments that show highly ornate DECORATION. No biographical details are known. The "Zuan Antonio Baffo dalle Spinette" who was married to Vittoria, daughter of Sellas the lute maker, on 6 July 1636, was probably his son. Fifteen instruments carry the name Baffo, the earliest being from 1523. This instrument is lost, but is unlikely to have been original. Only three of the instruments can be certified as Baffo's work; two have not been examined, and the others have faked inscriptions. The signed original corpus consists of a polygonal virginal from 1570 and harpsichords dated 1574 and 1579 (not 1578, as recorded by Boalch; no. 5 does not exist). The harpsichords are unusual for their long scale (ca. 40 cm at c^1) and were undoubtedly made for a low pitch. The 1579 harpsichord is remarkable for the large COMPASS of CC/EE–c^3 (fifty-seven notes; Paris Conservatory).

DENZIL WRAIGHT

Bibliography

Barnes, John. "The Specious Uniformity of Italian Harpsichords," in *Keyboard Instruments: Studies in Keyboard Organology, 1500–1800*, ed. Edwin M. Ripin. Edinburgh: Edinburgh University Press, 1971. Reprint, New York: Dover, 1977.

Boalch.

Toffolo, Stefano *Antichi Strumenti Veneziani: 1500-1800, Quatro Secoli Di Liuteria E Cembalaria*. Venice: Arnsenale, 1987.

Wraight, Denzil. "Nouvelles études sur les clavecins italiens." *Musique Ancienne* 20 (1985): 67–81.

Wraight, Denzil. "The Stringing of Italian Keyboard Instruments c.1500 - c.1650", Ph.D diss., Queen's University of Belfast 1997, UMI order no.9735109: part 2, 48-57.

BALANCE PIN

(It. *perno della traversa del telaio*; Fr. *pointe de balance*.) A pin driven into the central RAIL of the wooden FRAME in order to carry the KEYS. It serves as a guide, pivoting the key at its fulcrum and preventing it from sliding or twisting.

DONATELLA DEGIAMPIETRO

Bibliography

Colt, C. F., and Anthony Miall. *The Early Piano*. London: Stainer and Bell, 1981.

Ford, Charles, ed. *Making Musical Instruments: Strings and Keyboard*. New York: Pantheon, 1979.

Hubbard.

BALANCE RAIL

The middle cross member of the keyboard FRAME, usually made of a hardwood, in which the BALANCE PINS for the KEY LEVERS are positioned. The key levers "balance" or pivot about the balance pins on this rail.

MICHAEL LATCHAM

BALBASTRE, CLAUDE-BÉNIGNE (1727–1799)

French organist and composer (b. Dijon, 22 Jan. 1727; d. Paris 9 May 1799). His imaginative service play-

ing at Saint Roch, Paris, and virtuoso performances of his organ concertos at the Concert Spirituel brought international acclaim. Both Ernst Ludwig GERBER and Jean-Benjamin de LABORDE credit Balbastre with inventing the PEAU DE BUFFLE register for harpsichord; Laborde additionally attributes to him the *fortepiano organisé*, a piano equipped with organ pipes. Balbastre's published compositions include one book each of *pièces de clavecin* (1759), *noëls* (1770), and accompanied keyboard sonatas (1779).

CAROL HENRY BATES

Bibliography

Brenet, Michel. *Les concerts en France sous l'ancien régime*. Paris, 1900. Reprint, New York: Da Capo, 1970.

Burney, Charles. *The Present State of Music in France and Italy*. London: T. Becket, 1771. Reprint, New York: Broude Brothers, 1969.

Curtis, Alan, and Mary Cyr. "Balbastre [Balbâtre], Claude-Bénigne." In *New Grove*.

Frécot, Madeleine. "Balbastre, Claude-Bénigne." In *MGG*.

———. "La vie et l'oeuvre de Claude-Bénigne Balbastre (1727–1799)." Doctoral diss., Université Paris Sorbonne, n. d.

Gardien, Jacques. *L'Orgue et les organistes en Bourgogne et en Franche-Comté au dix-huitième siècle*. Paris: Droz, 1943.

Gerber, Ernst Ludwig. *Historisch-biographisches Lexikon der Tonkünstler*. Leipzig: Breitkopf, 1790–92. Reprint, Graz, Austria: Akademische Druck-u. Verlagsanstalt, 1965.

La Borde, Jean-Benjamin de. *Essai sur la musique ancienne et moderne*. 4 vols. Paris: P.-D. Pierres, 1780. Reprint, New York: American Musicological Society Press, 1978.

Marcuse, Sibyl. *A Survey of Musical Instruments*. New York: Harper and Row, 1975.

Pierre, Constant. *Histoire du Concert spirituel 1725–1790*. Paris: Heugel, 1975.

BALDWIN ELECTRIC HARPSICHORD

An electrically amplified harpsichord designed around 1960 by the American engineer Caleb Warner, then associated with the Cambridge, Massachusetts, harpsichord builder Eric Herz. They subsequently sold the rights to the Baldwin Piano Company in Cincinnati. The instrument was made of lucite, masonite, and aluminum and featured an amplifying system with magnetic pickups and a swell pedal. A characteristic of the instrument was its ability to produce a substantial volume of sound useful in commercial music.

See also **Amplification**

ROBERT CONANT

Bibliography

Treggor, P. "Off the Soundboard." *Diapason* 59 (1968): 12.

Zuckermann, Wolfgang Joachim. *The Modern Harpsichord: Twentieth-Century Instruments and Their Makers*. New York: October House, 1969.

BAN, JOAN ALBERT (1597 OR 1598–1644)

Dutch musician and theorist (b. Haarlem, 1597 or 1598; d. there, 27 July 1644). Self-educated, Ban proposed a system for a "perfect keyboard" involving eighteen notes to the octave. This is a form of JUST INTONATION with SPLIT KEYS for all the normal "black notes" (sharps) and an extra D key in order to eliminate the SYNTONIC COMMA (the difference between 5 pure fifths and two octaves plus a pure major third).

DENZIL WRAIGHT

Bibliography

Ban, Joan Albert. *Zangh-bloemzel & Kort sangh-bericht*. Amsterdam, 1642–43. Facs. ed., ed. Frits Noske. Amsterdam: Knuf, 1969.

BANCHIERI, ADRIANO (1568–1634)

Italian composer, organist, theorist, and writer (b. Bologna, 3 Sept. 1568; d. there, 1634). Banchieri was an Olivetan/Benedictine monk. Although he greatly influenced the music of the seventeenth century, some of his comments cannot be taken literally. In his 1609 work, *Conclusioni nel suono dell'organo,* Banchieri distinguishes three types of quilled instruments: *arpicordo* (ARPICHORDUM, from David's harp), *gravecembalo* (GRAVICEMBALO, due to its gravity), and SPINET (allegedly from the name of its inventor!). His writings are generally applicable to both organ and harpsichord. He was also the inventor of the ARPITARRONE.

LUCY HALLMAN RUSSELL

Bibliography

Banchieri, Adriano. *Conclusioni nel suono dell'organo*. Bologna: Heredi di G. Rossi, 1609. Facs. ed., Milan: Bollettino bibliografico musicale, 1934.

BARNES, JOHN (ROBERT) (1928–1998)

British musicologist (b. Windsor, 11 Oct. 1928; d. Edinburgh, 9 Mar. 1998). Barnes was trained as a physicist at the University of London before becoming curator of the Russell Collection of Early Keyboard Instruments, Edinburgh (1968–83). He was an expert on early keyboard instruments, including the early piano. In his 1979 article he proposed an IRREGULAR TEMPERAMENT (with six fifths tempered by one-sixth of a DITONIC COMMA and six just fifths) for works such as JOHANN SEBASTIAN BACH'S *Well-Tempered Clavier*.

RUDOLF A. RASCH

Bibliography

Barnes, John. "Bach's Keyboard Temperament." *Early Music* 7, no. 2 (1979): 236–49.

———. "Boxwood Tongues and Original Leather Plectra in Eighteenth-Century English Harpsichords." *Galpin Society Journal* 54 (2001): 10–15.
———. "Does restoration destroy evidence?" *Early Music* 8, no. 2 (1980): 213–18.
———. "Instruments, Restoration of." In *New Grove*.
———. *Making a Spinet by Traditional Means*. Welwyn, England: Mac and Me Ltd., 1985.
———. "Pitch Variations in Italian Keyboard Instruments." *Galpin Society Journal* 18 (1965): 110–16.
———. "The Specious Uniformity of Italian Harpsichords," in *Keyboard Instruments: Studies in Keyboard Organology, 1500–1800*, ed. Edwin M. Ripin. Edinburgh: Edinburgh University Press, 1971. Reprint, New York: Dover, 1977.
———. "The Stringing of Italian Harpsichords." In *Der Klangliche Aspekt beim Restaurieren von Saitenklavieren*, ed. Vera Schwarz. Graz, Austria: Akadem Druck-u. Verlags, 1973.
Rasch, Rudolf A. "Does 'Well-Tempered' Mean 'Equal-Tempered'?" In *Bach, Handel, Scarlatti: Tercentenary Essays*, ed. Peter Williams. Cambridge: Cambridge University Press, 1985.

BARREL HARPSICHORD

See HARPSICHORD, BARREL

BARRING

The placement of light reinforcing RIBS glued under the SOUNDBOARD running across the grain of the WOOD. It serves two purposes: (1) to improve the even propagation of soundwaves by increasing the stiffness of the soundboard across the grain, and (2) to reinforce the soundboard against STRING TENSION (particularly the 4' choir), and the downward pressure of the BRIDGES. It also prevents sagging in the otherwise unsupported area of the soundboard known as the CUT-OFF BAR.

The two most common types of soundboard barring are the Italian and Flemish styles. The Italian style often consisted of four or five transverse RIBS that extended diagonally across the soundboard and were cut out where they passed under the bridge; the Flemish style consisted of four RIBS confined within the area of the diagonal cut-off bar.

See also **Case**

STEPHEN MELLO

Bibliography

Hubbard.
Kottick, Edward L. *The Harpsichord Owner's Guide*. Chapel Hill: University of North Carolina Press, 1987.

BARTON, THOMAS (FL. 1685–CA. 1735)

British maker of SPINETS and harpsichords. Barton's workshop was located in Bishopsgate, London. He was apprenticed to Stephen KEENE and set up on his own about 1706. A number of his typical English bentside wing spinets survive, and one harpsichord dated 1709. Like the other surviving instruments of the first quarter of the eighteenth century (by Thomas HANCOCK, HITCHCOCK, and Benjamin SLADE), these instruments are important in tracing the development of English harpsichord building before KIRKMAN and SHUDI almost completely standardized English instrument building.

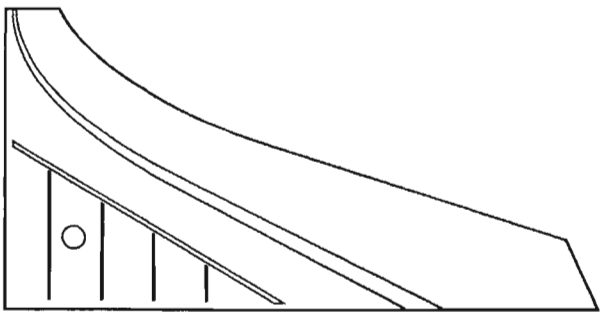


Fig. 7. Barring

See also **England**

CHARLES MOULD

Bibliography

Boalch.

BARTON, WILLIAM (FL. 1730)

British harpsichord maker, possibly the son of THOMAS BARTON. William Barton is remembered chiefly for a patent (1730) for plectra of silver, BRASS, and steel. Although this may appear to be innovative, similar devices were used by other builders throughout the history of the harpsichord in almost every country where they were built.

CHARLES MOULD

Bibliography

Boalch.

BASEBOARD

The bottom board of a keyboard instrument. Some instruments omit the baseboard, depending on the FRAME, BRACES, and STRUTS to perform a similar role.

BATTEMENT

(Fr., beating). A seventeenth- and eighteenth-century term applied to ORNAMENTATION involving the alternation of two adjacent notes: a short or long MORDENT, the former starting with the principal note and the latter

with the lower auxiliary; a trill on the principal note; or a gamba vibrato executed with two fingers.

CAROL HENRY BATES

BATTEN

Any thin strip, or lath, of WOOD, used in keyboard ACTIONS; for example, the piece of wood on which the FELT or LEATHER pads for the HARP STOP are mounted is usually referred to as the "harp batten."

CHARLES MOULD

BATTERY

(1) A simple or figured arpeggio (e.g., the ornament table in Charles François Dieupart's *Six suites de clavessin* (1701)). (2) broken-chord figuration in general (Alberti basses, arpeggiated passagework, etc., per the ornament table in Jean-Philippe RAMEAU's *Pièces de clavecin*, 1724: "The thumb 1 is to be in the middle of this battery)." (3) the Baroque practice of playing a chordal passage in arpeggiated fashion, momentarily introducing nonchordal tones if desired (JOHANN SEBASTIAN BACH, "Chromatic" Fantasia, BWV 903, mm. 28ff).

See also **Arpeggiation; Ornamentation; Thumb, Use in Playing**

CAROL HENRY BATES

Bibliography

Rameau, Jean-Philippe. "De la mechanique des doigts sur le clavessin," in *Pièces de clavecin*. Paris, 1724. Facs. ed., New York: Broude, 1967. Trans. and ed. Erwin R. Jacobi in *The Complete Theoretical Writings of Jean-Philippe Rameau*. 6 vols. [Middleton, WI]: American Institute of Musicology, 1967–72.

Saint Lambert, Monsieur de. *Les Principes du Clavecin*. Paris, 1702. Facs. ed., Geneva: Minkoff, 1974. Trans. and ed. Rebecca Harris-Warrick as *Principles of the Harpsichord*. Cambridge: Cambridge University Press, 1984.

BAUMGARTNER, JOHANN (FL. 1683)

Austrian clavichord maker. A surviving clavichord by Baumgartner (Bolzano, Austria) is now in the Národni Muzeum, Prague. This example, with black NATURALS and white SHARPS, has an overall CASE dimension of 134 × 42 cm. In addition to the fact that Austrian instruments are very scarce, the Baumgartner clavichord is unique in that for its year of manufacture (1683), its extended chromatic COMPASS is C–f^3. The instrument is signed "Erzeuger Johann Baumgartner, Bozen 1683."

ROBERT PORTILLO

Bibliography

Baines, Anthony C. "Clavichord." In *New Grove*.
Boalch.
Russell.

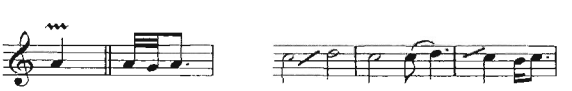
BEARING OCTAVE

The octave range on the KEYBOARD that is the first to be tuned completely chromatically. Today the bearing octave usually is from f to f^1 around middle C. Many earlier instructions give larger bearing ranges, for example c–f^1 (Pietro AARON, 1523; Michael PRAETORIUS, 1618) or c-g^1 (Jean II Denis, 1650). If the bearing RANGE is restricted to an octave, TUNING must proceed with rising fifths and falling fourths, or vice versa. If one wants to tune with octaves and fifths only, the bearing range must be at least one octave plus a tritone. The pitches of the keys within the bearing range are subsequently used for the tuning of the notes above and below the bearing range, with the help of pure octaves.

RUDOLF A. RASCH

BEAT

A late seventeenth-century English term for certain ornaments or symbols thereof; specifically, a MORDENT indicated by a wavy line over the main note (see ex. 1a); a lower APPOGGIATURA (indicated by an ascending oblique line placed before the main note (see ex. 1b), also called a forefall. Christopher Simpson (1659) and John Playford (1660s) called the ascending appoggiatura a beat (see ex. 1b.); Matthew Locke (1675) and Henry Purcell (1696) called the ascending appoggiatura a forefall; and Thomas Mace (1676) called it a half-fall. All are represented by an ascending stroke (see ex. 1b).



1a. 1b.

1c.

Purcell's representation for the beat, found in "Rules for Graces" in *A Choice Collection of Lessons* (1696), is interpreted as the later sign (see ex. 1c).

See also **Ornamentation**

MARITZA H. F. MASCARENHAS

Bibliography

Ferguson, Howard. *Style and Interpretation: An Anthology of 16th–19th Century Keyboard Music*. Vol. 1. Oxford: Oxford University Press, 1963.

BEATS

When two sinusoidal sound waves with only a small difference in FREQUENCY are generated simultaneously, they will be perceived as a single sound wave, but with a periodic rise and fall of the amplitude. This periodic rising and falling of the amplitude is called beating. The individual bursts with relatively large amplitude are called beats. The number of beats per second is called the beat frequency (also beat speed or beat rate).

Beats are of importance when TUNING tempered consonant INTERVALS, because these intervals contain harmonics (one from the lower and one from the higher tone) with a small frequency difference, resulting in beating. The beat frequency is dependent on the amount of tempering. On the other hand, a certain amount of tempering can be set when one tunes the interval to a certain beat frequency.

The phenomenon of beating was first described by Arnolt SCHLICK in 1511, later by such authors as Marin MERSENNE (*Harmonie universelle*, 1636-37), Andreas WERCKMEISTER (1691), and Joseph SAUVEUR (1701), before Robert SMITH (1749) provided the first scientific account and the first formulas for calculating beat frequencies. Smith based his view on the then predominant but faulty premises of the impulse theory of sound. Hermann von HELMHOLTZ (1863) was the first person to explain beats from the wave theory of sound.

The beat frequency of a tempered consonant musical interval is most easily calculated by the formula $fqT/1731$, in which f is the fundamental frequency in hertz (cycles per second) of the lower tone of the interval, q the higher ratio number of the just interval (3 for the fifth, 5 for the major third, etc.), and T the tempering in cents (see Rasch).

See also **Temperament**

RUDOLF A. RASCH

Bibliography

Helmholtz, Hermann von. *Die Lehre von den Tonempfindungen als physiologische Grundlage für der Theorie der Musik*. 4th ed. Berlin, 1877. Trans. Alexander J. Ellis as *On the Sensations of Tone as a Foundation of Music Theory*. 2d ed. 1885. Reprint, New York: Dover, 1954.

Rasch, Rudolf A. "Theory of Helmholtz-Beat Frequencies." *Music Perception* 1 (1984): 308–22.

Smith, Robert. *Harmonics, or the philosophy of sound*. Cambridge: J. Bentham, 1749. 2d ed. Cambridge: J. Bentham, 1759.

Vos, Joos. "Purity Ratings of Tempered Fifths and Major Thirds." *Music Perception* 3 (1986): 221–58.

BEBUNG

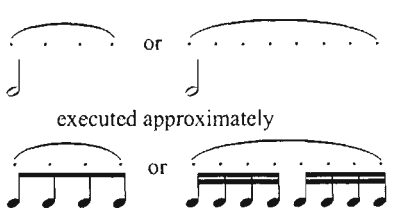
(Ger. *beben*, to tremble; Fr. *balancement*; It. *tremolo*, *vibrato*.) The "trembling" of a single tone, produced on the CLAVICHORD by the fluctuating pressure of a TANGENT against the strings. Johann MATTHESON (1739) calls *das Beben der Stimme* "the gentlest vocal tremor on one fixed tone. . . . Particularly on lutes, violins, and clavichords, fingertip motions may produce somewhat the same effect. . . . One can indicate where a . . . tremor should take place, but neither pen nor symbol can show how it should be done. The ear must learn it."

CARL PHILIPP EMANUEL BACH writes "a long affettuoso tone is played with the vibrato" (1753), and that "the best effect is achieved when the finger withholds its shake until half the note value is over" (1787); he gives *d* for a symbol. Charles BURNEY describes Bach's *Bebung* as "a cry of sorrow and complaint, such as can be effected upon his clavichord."

For Friedrich Wilhelm MARPURG (1755) the Bebung is "controlled on stringed instruments by the fingertips and on wind instruments and in singing, by the breath. It is possible on a few clavichords and is rewarding on J[ohann] HOHLFELD's bowed flügel [BOGENFLÜGEL]. . . . The custom is to place over the note as many dots note as there are finger motions. . . . It imitates the organ tremulant."

Concerning the clavichord Bebung, Daniel Gottlob TÜRK (1789) writes that "the finger is not lifted completely off the key, but stays as long as the note's duration, attempting to reinforce the tone by a repeated, gentle pressure. . . . It is achieved only on a very good clavichord . . . and is used on long notes, particularly in melancholy compositions or the like." He warns in general against the frequent use of Bebung and "the ugly exaggeration of the tone by too violent a pressure." His Bebung markings are depicted here.

JOAN BENSON



Bibliography

Bach, Carl Philipp Emanuel. *Versuch über die wahre Art das Clavier zu spielen*. 2 vols. Berlin: G. L. Winter, 1753, 1762. Trans. and ed. William J. Mitchell as *Essay on the True Art of Playing Keyboard Instruments*. New York: W. W. Norton, 1949. Rev. ed. Leipzig: Schwickert, 1787.

Burney, Charles. *The Present State of Music in Germany, the Netherlands and United Provinces*. London, 1773. 2d ed., London: T. Becket, 1775. German trans. of 1st ed. by J. J. C. Bode as *Tagebuch seiner Musikalischer Reise, zweyter teil, durch Flandern, die Nederlande und am Rhein bis Wien*. Hamburg, 1773. Facs. ed., Kassel, Germany: Bärenreiter, 1959.

Marpurg, Friedrich Wilhelm. *Anleitung zum Clavierspielen*. Berlin: Haude und Spener, 1755, 1765. Facs. of 1765 ed., New York: Broude Brothers, 1969; Hildesheim: G. Olms, 1970. Trans. Elizabeth L. Hays as "F. W. Marpurg's 'Anleitung zum Clavierspielen' (Berlin, 1755) and 'Principes du clavecin' (Berlin, 1756)." Ph.D. diss., Stanford University, 1977.

Türk, Daniel Gottlob. *Clavierschule, oder Anweisung zum Clavierspielen für Lehrer und Lernende* (Leipzig and Halle, 1789). Trans. and ed. Raymond H. Haggh as *School of Clavier Playing*. Lincoln: University of Nebraska Press, 1982.

BÉDOS DE CELLES, (DOM) FRANÇOIS (1709–1779)

French organbuilder (b. Caux, near Bèziers, 24 Jan. 1709; d. St. Denis, 25 Nov. 1779) and writer on organ construction, REGISTRATION, and aesthetics. Bédos de Celles became a member of the Order of St. Benedict at the Congregation de St. Maur à la Daurade in Toulouse on 7 June 1726. He became the secretary of the Abbaye Ste.-Croix at Bordeaux in 1745. In 1748 he built an organ for the monastery church there, much of whose pipework still survives; the organ was transferred to Bordeaux Cathedral following the revolution of 1789. He was elected a member of the Académie des Sciences in Bordeaux in 1759, and was later elected a member of the same organization in Paris. As well as building an organ for the church of St. Vincent during the years 1761–62, he served as a consultant on many other such matters.

Bédos de Celles's reputation rests chiefly upon his writings, most notably his *L'art du facteur d'orgues*. This work focuses on all aspects of the construction of organs, with much information on the specifications, mechanics, and materials involved in organ building, as well as pipe scaling (diameter and proportion), composition of the mixture stops, and the manufacturing of the pipes themselves. There is additional information concerning the tools necessary for organ building, and many detailed diagrams and drawings are supplied. In sum, Bédos de Celles defines the standards and aesthetic of classical French organ construction in the latter half of the eighteenth century. He also writes in some detail about organ playing, with particular emphasis on ARTICULATION, ORNAMENTATION, and registration.

L'art du facteur d'orgues contains drawings of a CLAVIORGANUM, a combination of organ and harpsichord that shares common keyboards—a square piano combined with an organ and a *vielle organisée* (GEIGENWERK). Bédos de Celles also contributed articles on new organs to the periodical *Mercure de France* (*Lettre a l'auteur du Mercure, sur les nouvelles orgues de Saint Martin de Tours*; 1762).

DAVID SCHRADER

Bibliography

Bédos de Celles, François. *L'art du facteur d'orgues*. Paris: L. F. Delatour, 1766–78. Facs. ed., ed. Christhard Mahrenholz. 3 vols. Kassel, Germany: Bärenreiter, 1934–36. Facs. ed., 2 vols., Paris: Léonce Laget, 1976. Trans. and ed. Charles Ferguson as *The Organ-Builder*. 2 vols. Raleigh, NC: Sunbury, 1977.

———. "Lettre à l'auteur du Mercure, sur les nouvelles Orgues de Saint-Martin de Tours." *Mercure de France*, January 1762, 133–42. German trans. in Jacob Adlung, *Musica mechanica organoedi*. Ed. J. L. Albrecht and J. F. Lorenz. 1768. Reprint ed., ed. Christhard Mahrenholz. Kassel, Germany: Bärenreiter, 1931.

Halle, J. S. "Orgelbau." *Werkstätte der heutigen Künste* 6 (1779).

Hamel, Marie-Pierre. *Nouveau manuel complet du facteur d'orgues*. Paris: Librairie Encyclopique de Roret, 1849.

Klotz, Hans. *Über die Orgelkunst der Gotik, der Renaissance und des Barock*. Kassel, Germany: Bärenreiter, 1934. Rev. ed., Kassel, Germany: Bärenreiter, 1975.

Mahrenholz, Christhard. *Die Berechnung der Orgelpfeifen-Mensuren vom Mittelalter bis zur Mitte des 19. Jahrhunderts*. Kassel, Germany: Bärenreiter, 1938.

———. *Die Orgelregister: ihre Geschichte und ihr Bau*. Kassel: Bärenreiter, 1930. 2d ed., Kassel, Germany: Bärenreiter, 1944; 3d ed., Kassel, Germany: Bärenreiter, 1968.

Raugel, Felix. *Les Lépine et Dom Francois Bédos de Celles*. Paris, 1917.

———. *Recherches sur quelques maîtres de l'ancienne facture d'orgues françaises*. Paris: Herelle, Fortemps, 1919.

Sumner, William Leslie. *The Organ*. 4th ed. London: Macdonald, 1975.

Töpfer, Johann Gottlob. *Lehrbuch der Orgelbaukunst*. 1855. Rev. ed. edited by Max Allihn as *Die Theorie und Praxis des Orgelbaus*. 1888. Facsimile reprint, Bibliotheca Organologica. Buren, Netherlands: Knuf, 1972.

Vollbeding, C. *Kurzgefasste Geschichte der Orgel aus dem Französischen des Dom Bédos de Celles*. Berlin, 1793.

Williams, Peter. *The European Organ: 1450–1850*. London: B. T. Batsford, 1966.

BEETHOVEN, LUDWIG VAN (1770–1827)

Although his earliest keyboard experiences may have involved the harpsichord and clavichord, the pianoforte was already well established by Beethoven's youth in Bonn. In professional performance practice,

harpsichords persisted, if at all, only in orchestral use. Title pages of works unmistakably suited only for the pianoforte, like Beethoven's sonata in C♯ minor (op. 27, no. 2; "Moonlight"), continued to list the *clavicembalo* or *clavecin*, apparently as an alternative performing medium. This purely conventional usage continued into the time of Franz Liszt. A clavichord formerly exhibited in the Paris Conservatory collection as Beethoven's is now thought to have little right to such a claim. The slurred repeated notes in the piano sonatas (opp. 28 and 110), the sonata for piano and cello (op. 69), and the four-hand arrangement of the *Grosse Fuge* (op. 134) are not considered efforts to translate the clavichord vibrato (BEBUNG) to the pianoforte, as was once believed.

HOWARD SCHOTT

Bibliography

Juramie, Ghislaine. *Histoire du piano*. Paris: Éditions Prisma, n. d.

Newman, William S. *Beethoven on Beethoven: Playing His Piano Music His Way*. New York: W. W. Norton, 1988.

BELGIUM

SEE LOW COUNTRIES

BELLOT, PIERRE (CA. 1675–1732)

French harpsichord maker. A harpsichord (1729) by this Parisian builder is in the Archbishop's Palace, Chartres (one manual, GG–c^3, two 8' registers). Two sons, Pierre II and Louis (fl. 1717–1759), built harpsichords. One harpsichord by Louis (1742) survives (Metropolitan Museum of Art, New York; two manuals, GG–e^3, two 8' stops, one 4' stop, length 8' 2"). Louis invented a BRIDGE (1732) equalizing paired unison string lengths (not used in the 1742 instrument).

JANE L. JOHNSON

Bibliography

Boalch.

Hubbard.

BELLY RAIL

A long, flat piece of wood standing vertically, onto which the front edge of the SOUNDBOARD or belly is glued. It is sometimes glued to the BASEBOARD, and may be joined to the sides of the CASE.

See also **Gap**

MICHAEL LATCHAM

BENCH STAND

A harpsichord stand made like a pair of high benches, wider at the KEYBOARD end, with broad, fret-sawn side supports. This type was most popular in Italy and Iberia, but rarely found elsewhere. The Portuguese were especially fond of a uniquely configured stand with an inverted heart cutout.

See also **Pedestal Stand; Stand; Tray Stand; Trestle Stand**

BENTSIDE

The curved or treble side of the harpsichord or bentside SPINET CASE, angled from the ends of the shortest STRINGS to the ends of the longest bass strings (or from the TAIL to the CHEEK PIECE). In most English harpsichords, this side begins behind the end of the KEY BED with a concave bow and then runs straight to an angled end that meets the straight or bass (left) side. Occasionally, in the DOUBLE BENTSIDE, the bentside terminates in another curve, this time a convex bow to unite with the straight side, which creates a continuous S curve (a feature of the German tradition). Double bentside also refers to a construction, used by Johannes Daniel DULCKEN and others, in which there is another invisible bentside, doubling the external visible one. Originally cut and steamed, bending timber in this way was later performed by laminating, gluing, and then clamping within cauls.

ARTHUR W. J. G. ORD-HUME

BERGER, JOSEPH-ANTOINE (1719–1777)

French organist. In 1762, Berger, organist at Grenoble Cathedral, submitted to the Académie des Sciences (Paris) his invention, a crescendo *genouillière* (KNEE LEVER) that controlled movement of the BUFF STOP. Although Berger received a certificate of merit from the Académie, contemporaneous sources suggest that his device was not popular, and no trace of his work exists today. The crescendo mechanism was also applied to the CLAVIORGANUM, a two-manual hybrid instrument that combines one organ manual with one harpsichord manual. This invention was submitted to the Académie in 1765.

MARGARET VAN DIJK

Bibliography

Boalch.

Hubbard.

BERMUDO, JUAN (CA. 1510–CA. 1565)

Spanish theorist and composer (b. Ecija, ca. 1510; d. Andalusia, ca. 1565). Bermudo's unfinished *Libro*

llamado declaración de instrumentos musicales (1555) was an elaboration of two earlier treatises, *El primo libro de la declaración de instrumentos* (1549) and *El arte tripharia* (1550). The *Declaración* of 1555 comprises five books devoted to the theory and practice of plainsong, polyphony, the playing of the vihuela and the *monachordio* (MONOCHORD), and composition. Although Bermudo at times used the term *monachordio* in a generic sense, his comments usually refer to the clavichord. Bermudo discusses FINGERINGS, PITCH, transposition, and the use of CHROMATIC notes. His description of the KEYBOARD includes what appears to be the earliest mention of the SHORT OCTAVE in a theoretical work. From allusions spread in the *Declaración*, it can be deduced that the missing sixth and seventh books would have included the description of an enharmonic MONACHORDIO, probably with seventeen notes in the octave.

NICOLAS MEEÙS

Bibliography

Bermudo, Juan. *Declaración de instrumentos musicales*. 1555. Facs. ed., ed. M. S. Kastner. Kassel, Germany: Bärenreiter, 1957.

Meeùs, Nicolas. "Juan Bermudo et le clavier enharmonique." *Bulletin de la Société liégeoise de musicology* (1974): 1–16.

Stevenson, Robert. "Bermudo, Juan." In *New Grove*.

BERTARINUS, IOANNES BAPTISTA (1554–1595)

Italian harpsichord maker. Bertarinus is known only by an instrument preserved in the Museo Bardini, Florence. The inscription suggests that Bertarinus came from Pesaro on the Adriatic coast, although the instrument was made in Rome in 1577. It originally had a single 8' choir and COMPASS C/E–c^3, although a second set of 8' STRINGS was added at some later date.

DENZIL WRAIGHT

Bibliography

Hellwig, Friedemann. "The Single-Strung Italian Harpsichord." In *Keyboard Instruments: Studies In Keyboard Organology, 1500–1800*. Rev. ed., ed. Edward M. Ripin. Edinburgh: Edinburgh University, 1971. Reprint, New York: Dover, 1977.

BERTIN, DANIEL (FL. 1757)

Prussian organ builder. Bertin, active in Memel (now Klaipeda, Lithuania), is reported by Jacquot to have invented the CEMBAL D'AMOUR in about 1757, but it is more likely he merely copied the instrument previously invented by Gottfried SILBERMANN in 1721.

THOMAS MCGEARY

Bibliography

Boalch

Jacquot, Albert. *Dictionnaire pratique . . . des instruments de musique anciens et moderns*. Paris: Fischbacher, 1886.

BERTOLOTTI, ALESSANDRO (FL. 1585–1586)

Venetian instrument builder. Bertolotti (Bortolotti) is listed in a seventeenth-century Este inventory as a builder of a "good harpsichord for the theater and the academy," rather than for the chamber or the oratorio. (The builder Bortolotti di Cotino is also mentioned.) His polygonal virginal of 1586 is in the Russell Collection, Edinburgh; there is a harpsichord of 1585 incorporated into a CLAVIORGANUM, the organ added as late as 1677 by Theodor W. S. Gut, now in the Brussels Conservatory. The harpsichord is mounted atop the positive organ.

LUCY HALLMAN RUSSELL

Bibliography

Valdrighi, L. F. *Musurgiana 1873–1970*. Reprint, Bologna: Forni, n. d.

BIDERMANN

German family of mechanical instrument makers; sometimes spelled Biderman. Active in Augsburg, an early center of European mechanical musical instrument making, Samuel Bidermann the elder (1540–1622) and his brother Johann Bidermann excelled in the making of very small clockwork-driven table spinets, some of which united automatic playing (from a pinned barrel) with a manual KEYBOARD.

Often combined with a small clock and an automaton display of small moving figures, these spinets were frequently compound instruments that played in unison with an organ. Like many similar miniature organs of the time, the use of reed regals instead of pipes allowed a lower and more acceptable pitch of sound to be produced from short pipework housed in the confined space next to the SPINET SOUNDBOARD.

The Bidermanns learned their art and craft from Hans Leo Hassler (1564–1612), and at least three of their instruments survive; they also worked with Achilles Langenbucher on the remarkable "Pomeranian cabinet" presented to the Emperor Philipp II of Pomerania in 1617 (destroyed during World War II). Samuel Bidermann the younger (1600–1647) and his brother Daniel Bidermann followed in their father's footsteps, making mechanical spinets and organs in conjunction with Veit Langenbucher (ca. 1587–1631) who, with his sons, took the art to an even higher plane.

ARTHUR W. J. G. ORD-HUME

Bibliography

Groiss, Eva. "Automatophone Musik." In *Die Welt als Uhr: Deutsche Uhren and Automaten 1550–1650*, ed. Laus Maurice and Otto Mayr. Munich: Deutscher Kunstverlag. 1980.

Haspels, Jan Jaap. *Automatic Musical Instruments 1580–1820*. Deventer: Kluwer, 1987.

Klotz, Hans. "Bidermann." In *New Grove Mus Instr.*

Ord-Hume, Arthur W. J. G. *Automatic Pianos*. Atglen, PA: Schiffer, 2004.

Protz, Albert. *Mechanische Musikinstrumente*. Kassel, Germany: Bärenreiter, 1939.

BIEST, MARTEN VAN DER (FL. 1557–D. 1588)

Belgian harpsichord builder. Biest was one of the original group of ten Antwerp harpsichord makers to be admitted into the Guild of St. Luke in 1558. That he was a witness to Hans RUCKERS's marriage in 1575 suggests there was a close relationship between the two, perhaps that of master and apprentice. Biest left Antwerp in the politically turbulent mid-1580s and became a citizen of Amsterdam in 1587. His only surviving instrument is a splendid double virginals (with mother of the spinet type), dated 1580 (Germanisches Nationalmuseum, Nürnberg).

See also **Low Countries**

JOHN KOSTER

Bibliography

Boalch.

Curtis, Alan. "Dutch Harpsichord Makers." *Tijdschrift van de Vereniging voor Nederlandse Muziekgeschiedenis* 19 (1960): 44–66.

Lambrechts-Douillez, Jeannine, and M.-J. Bosschaerts-Eykens. *Andreas Ruckers de oude, Andreas Ruckers de jonge*. Antwerp: Ruckers Genootschap, 1984.

Meer, John Henry, van der. "Flämische Kielklaviere im Germanischen Nationalmuseum, Nürnberg." In *Colloquium: Restauratieproblemen van Antwerpse klavecimbels*. Antwerp: Ruckers Genootschap, 1970.

Stellfeld, J. A. "Bronnen tot de Geschiedenis der Antwerpsche Clavecimbel- en Orgelbouwers in de XVI^{e} en XVII^{e} Eeuwen." *Vlaamsch jaarboek voor muziekgeschiedenis* 4 (1942): 3–110.

Ripin, Edwin M. "Virginal." In *New Grove Mus Instr.*

BLANCHET

Family of Parisian harpsichord makers. The Blanchet dynasty flourished from the seventeenth century through the end of the eighteenth century and as piano makers for the first half of the nineteenth. During the years 1766 to 1793, the family business was carried on by Pascal TASKIN.

The Builders

Although a Nicolas Blanchet is listed as a master instrument maker in the first half of the seventeenth century, his relationship to this family is unknown. The apparent founder of the dynasty was (another) Nicolas Blanchet (ca. 1660–1731), the son of a draper who had retired to Reims. He completed his apprenticeship in Paris, married the daughter of a cooper in 1686, and became a master in the guild by examination in 1689. He set up shop in the rue des Fosses-Saint-Germain in the parish of Saint-Germain l'Auxerrois. By 1701 his affairs had prospered to the point that he could invest 3000 *livres* in an annuity in the royal treasury, this at a time when a double-manual harpsichord was worth about 100 livres. In 1717 as treasurer of the Guild of Instrument Makers, his accounts showed a surplus, an event rare enough to be mentioned. At about this time he moved his establishment to the rue Saint-Germain l'Auxerrois. In 1722 Nicolas took his second son, François-Etienne Blanchet I (ca. 1700–1761), into the business as a partner, sharing equally in the profits, with the son owning one quarter of the capital. The partnership was very successful; by the time of Nicolas's death the value of the business had nearly tripled.

In 1727 François-Etienne I married Elizabeth-Martine Gobin, who with her siblings owned a share of a large house in the rue de la Verrerie. The family and workshop soon moved there. This house, now 167 rue de la Verrerie ("vis-à-vis la petite port de Saint Merry"), served as location of the Blanchet and Taskin workshops for the rest of the century. Under François-Etienne I, the business continued to prosper. He was elected guild examiner in 1739. In 1743 the firm began its association with the court, which would prove extremely profitable when a harpsichord was built for the daughters of Louis XV for their use at the abbey of Fontevrault and, later, when Christophe Chiquelier, *garde des instrument du roi,* began to send the repair work on the many royal harpsichords to the Blanchet workshop. In 1752, François-Etienne I's daughter, Elizabeth-Antoinette, married the composer ARMAND-LOUIS COUPERIN. Possibly through the intervention of Marguerite-Antoinette Couperin, daughter of FRANÇOIS COUPERIN and *musicienne ordinaire,* François-Etienne I was awarded the title of *facteur de clavecins de roi.*

François-Etienne Blanchet II (ca. 1730–1766) certainly apprenticed in his father's shop and became a master in the guild in 1753. In the same year he married his cousin Marie-Geneviève Gobin, who apparently owned another share in the family house. He established his own shop in the house, which enabled the family to double its building capacity while evading the guild restrictions on the number of journeymen and

apprentices allowed for each master. The two Blanchets seem to have both held the title of *facteur de clavecins du roi.* It is not possible to distinguish their work until after the the retirement of François-Etienne I in 1759. Prosperity continued with François-Etienne II, who was able to buy a country house in Pantin, outside of Paris, and a carriage to get there; in 1765 he was elected guild examiner.

François-Etienne II died suddenly in the spring of 1766, leaving three small children. His widow married Pascal Taskin in the fall of that year. Taskin succeeded to the business, the shares in the house, and the title of *facteur de clavecin du roi.* Taskin expanded the business and the family fortune even further through his innovations and business acumen. Armand-François-Nicolas Blanchet (1763–1818), the oldest surviving child of François-Etienne II, was raised by his stepfather Taskin, sharing his residence as his companion after 1781. In 1793 Armand-François-Nicolas inherited the business from Taskin and married Taskin's mistress, Marie Louise Desiau. Noted as a skilled tuner, he published his *Méthode abrégée pour accorder le clavecin et le piano* in 1801. He was succeeded in the business by his son, Nicolas Blanchet II, who built pianos in partnership with Jean (Johann) Roller as Blanchet et Roller; Roller retired in 1851. Nicolas II was succeeded by his son P. A. C. Blanchet in 1855. The firm survived into the 1870s.

Original Instruments

The number of Blanchet harpsichords surviving from three quarters of a century of production is disappointingly small; those known to survive into modern times are listed in Table 1.

The several surviving instruments of Nicolas illustrate well the transition occurring at the turn of the eighteenth century from the light walnut-cased harpsichords of the so-called native school of Parisian makers to the RUCKERS-inspired style that eventually became standard. The 1693 double harpsichord has such conservative features as the CASE sides overlapping the bottom, a top molding let into the edge of the case, and an Italianate molding cut into the four-foot BRIDGE. Its case is made of lime or poplar, like a Flemish instrument, and has a Flemish-like shape. The STRING scaling is similar to eighteenth-century Blanchet instruments. The surviving JACKS in this instrument suggest that it originally had its 4' REGISTER on the upper manual, a surprising feature for this date.

The 1696 OTTAVINO is quite conservative, having walnut case sides (except a poplar SPINE) and Italianate NUT and bridge. The SPINETS of 1709 and 1710 have painted pine cases like many later Parisian instruments, although the case sides still overlap the bottom. Their original KEYBOARD range is the same as the 1693 double; GG/BB–c^3, with a SPLIT KEY for BB and $E^\flat$. This conservative range for 1710 seems in keeping with the spinets being relatively modest instruments. The 1710 instrument survives with its original STAND and DECORATION. The undated double by Nicolas may be contemporary with these spinets (Dowd suggests ca. 1715). Its pine case sides overlap the bottom and it seems to have had an original range of GG–e^3. The scaling and shape of the case are more similar to the 1693 instrument than the later ones. Unfortunately a very thorough restoration from early in this century obscures much of its musical identity.

The doubles of 1730 and 1733 are particularly fine and unusual instruments. Musically they represent the apogee of the Parisian harpsichord of the first half of the eighteenth century. The 1730, in excellent playing condition, has a powerful yet clear bass, rich tenor and alto registers, and a clean if slightly brittle treble. It is perfect for elucidating the subtle musical lines, colors, and ornaments of contemporary French composers. This instrument has inspired many modern copies. The 1733 is its near twin, and is unique among antique harpsichords in never having been restored and never having left its original residence. The ACTION and many of the original strings remain intact. Both the 1730 and the 1733 were originally begun as large but unusually shallow doubles with a range of fifty-eight notes and a slightly wider octave span than they currently have. Neither was ever finished nor ever strung in this state. Both were deepened by about 25 mm and repinned for sixty notes (FF–e^3) with Blanchet's normal eighteenth-century octave span of 160 mm. Both instruments had high f^3 added later in the century. The complicated construction of these two harpsichords is fully described in Dowd. The 1733 is elaborately decorated with *singerie* and birds on a light gray and parcel-gilt ground and rests on a gilt *regence*-style stand. The instrument is illustrated in Mercier-Ythier.

The basic scale and case design of the Blanchet harpsichords began to change under François-Etienne I in the 1730s. The 1736 single has a bentside that is straight for about half its length and could have been made on the same form as those of the later instruments. The scaling is shorter in the tenor and bass than in 1730 and 1733, although the treble is quite similar. The 1746 double contains all the elements of this mature style. The smallest of the five-octave Blanchet doubles, it is several centimeters shorter and narrower than the earlier instruments. The case sides are a bit heavier than the earlier ones, averaging 17 mm thick, and are joined with dovetails. The spine tapers 3 mm in thickness from front to TAIL. The scaling is short like the 1736 in the tenor and bass and relatively long in the treble.

Table 1 Surviving Blanchet Harpsichords

Date	Builder	Type	Manuals	Boalch No.	Location
1693	NB	H	2	01	Paris, private collection
1696	NB	O	1	02	France, private collection
1709	NB	S	1	4	London, Horniman Museum
1710	NB	S	1	03	Angers, Musée des Arts
n.d. [ca. 1715]	NB	H	2	2	Paris, Huguette Dreyfus
1730	NB & FB	H	2	1	Framingham, MA, Charles Fisher
1733	FB	H	2	2a	France, Château de Thoiry
1736	FB	H	1	—	Paris, C. Mercier-Ythier
1746	FB	H	2	3a	Versailles, Château
1757	FB [sub nom Couchet 1671]	H	2	—	Chartres, Kenneth Gilbert
1765	FB II	H	2	—	Formerly Scarsdale, NY, Rosenbaum collection
n.d.	FB	H	2	3	Paris, Mme Oury

Notes:
Builder: NB = Nicolas Blanchet; FB = François-Etienne Blanchet I; FB II = François-Etienne Blanchet II
Type: H = harpsichord; O = ottavino; S = spinet

The instruments of 1757 and 1765, as well as the Taskins of 1769 and 1770, are further developments of the same model as the 1746. The scale design is quite similar, and the main differences are in the increasing thickness of the case parts and the increased SOUNDBOARD area in the tenor and bass of the 8' bridge. The 1765 Blanchet and the 1769 Taskin (Russell Collection, Edinburgh) are the most similar of this group. This is not surprising, because Taskin was certainly a senior journeyman by 1765 and was continuing the Blanchet designs in his early work as a master. The anomaly of this group is the 1757, which sports a Couchet ROSE and bears the date of 1671. Its soundboard is carefully pieced up out of the soundboards of two Couchet harpsichords (another date of 1673 was also found). The many scarf joints are carefully hidden by the fake "Flemish" soundboard painting. Bits of the Couchet shell gold border exist as well. The basic plan is that of the mature Blanchet harpsichords, and it should be considered a newly built Blanchet rather than a rebuild of something else. Small Flemish harpsichords appear in several Blanchet and Taskin inventories; this was probably their usual fate. The BENTSIDE is a slightly different shape from the others and the very heavy SPINE and CHEEK may date from Taskin's rebuilding in 1778. The sound of these mature style harpsichords features brilliant and singing trebles, rich tenor registers, and powerful booming basses. They are as perfectly suited for the colorful music of Jacques Duphly and Armand-Louis Couperin as the earlier instruments are suited to the more refined utterances of François Couperin.

Rebuilt Instruments

The Blanchet family was as well known to their contemporaries for their RAVALEMENT—the rebuilding of older harpsichords—as for their new instruments. Numerous Ruckers and Couchet harpsichords are advertised for sale in the eighteenth century with *claviers de Blanchet,* meaning that they had been enlarged in the Blanchet workshop. It seems likely that much of the family fortune was based on this activity, which must have also involved trading in old Flemish harpsichords. The remaining Blanchet *ravalements* are listed in Table 2.

The Blanchets often left their *ravalements* unsigned except occasionally on the action. The first two are attributed to Nicolas Blanchet by Dowd on the basis of their keyboards. In the 1701 work, Blanchet took an unusual single with a two 8' choir and three registers and transformed it into a three-register double. A 4' bridge was added, the case was pieced out in front, and one note was added to the bass. New keyboards were made with a fifty-one-note (GG/BB–c^3) compass with a split $E^{\flat}$/BB (the original range had been GG/BB–c^3). In the 1706 *ravalement,* Blanchet added a second 8' to a large Ruckers TRANSPOSING DOUBLE HARPSICHORD and crowded in a high $c^{\sharp 3}$ and d^3. His new keyboards