Reflections on Historical Harpsichord Registration

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ALTHOUGH MUCH HAS BEEN LEARNED about historical instruments and performance practices since the pioneering works of the mid-twentieth century, the difficulties of applying the principles of historically informed performance practice can be formidable even today. These difficulties increase proportionally with an increasing number of performers. Obviously, the problems are reduced in certain respects with repertoire involving a single performer. Although there are solo works for primarily melodic instruments such as the violin, cello, and recorder, the main Renaissance and Baroque instruments with which a full polyphonic musical texture can be rendered by a single performer are lutes and keyboards.

The principal stringed-keyboard instrument from the early sixteenth century to the late eighteenth was the harpsichord. After more than a century of effort by makers, restorers, and scholars (often one and the same, as with, for example, Frank Hubbard and Grant O'Brien[1]) it is now, I believe, possible to restore old harpsichords or to make new ones that, within a reasonable or even negligible margin of error, can attain the tonal and playing qualities of the various instruments historically appropriate for most of the Renaissance, Baroque, and early Classical repertoire. Playing these instruments with appropriate knowledge, skill, and insight will continue to be a challenging and worthwhile pursuit. There are, however, a number of ways in which the choice and use of instruments might be improved among musicians who wish to apply the principles of historically informed performance.[2]

Under the most favorable circumstances for performing a particular repertoire in a historically informed manner, a harpsichordist, having obtained an

[1] Frank Hubbard, *Three Centuries of Harpsichord Making* (Cambridge, MA: Harvard University Press, 1965); Grant O'Brien, *Ruckers: a Harpsichord and Virginal Building Tradition* (Cambridge: Cambridge University Press, 1990).

[2] David Schulenberg has observed that "much of what passes for 'authentic' playing on 'original' instruments is not what it purports to be" (*The Keyboard Music of J. S. Bach*, 2nd ed. [New York and London: Routledge, 2006], 9).

appropriate instrument,[3] would, among many other considerations, seek to use appropriate registrations. This is easier said than done, as written evidence on the subject from the historical heyday of the harpsichord is sparse. Except for special circumstances, as when François Couperin explained how to play a *pièce croisée* on the separate 8' stops of the two manuals,[4] composers almost never specified which registrations to employ. Tutors were generally silent on the subject, while Couperin recommended in his *L'Art de Toucher le Clavecin* (Paris, 1716; 2nd ed. 1717) merely that beginners of "early youth" (*premiere jeunesse*) should play on a spinet or on a single keyboard of a two-manual harpsichord.[5]

Some tentative conclusions about registration can be derived from musical scores, but the primary historical documents are the instruments themselves. If a registrational resource, such as a stop or a second manual, was not present on instruments of a certain place and time, players in that environment could not have used it—a stricture often overlooked by today's performers. Likewise

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[3] The familiar basic classification of historical harpsichord making as comprising five national schools—Italian, Flemish, French, English, and German—was presented in the pioneering mid-twentieth-century histories of the instrument. See Raymond Russell, *The Harpsichord and Clavichord: An Introductory Study* (London: Faber and Faber, 1959); and Hubbard's *Three Centuries*. This picture has since been refined and extended. It goes beyond the scope of this study to revisit the arguments in detail. Among the more recent literature are John Henry van der Meer, "Beiträge zur Cembalobau im deutschen Sprachgebiet bis 1700," *Anzeiger des Germanischen Nationalmuseums* (1966): 103–33; John Barnes, "The Specious Uniformity of Italian Harpsichords," in *Keyboard Instruments: Studies in Keyboard Organology, 1500–1800*, ed. Edwin M. Ripin (Edinburgh: Edinburgh University Press, 1971), 1–10; O'Brien, *Ruckers*; Alfons Huber, ed., *Das österreichische Cembalo: 600 Jahre Cembalobau in Österreich* (Tutzing: Hans Schneider, 2001); Darryl Martin, "The Native Tradition in Transition: English Harpsichords circa 1680–1725," in *The Historical Harpsichord*, vol. 5, *Aspects of Harpsichord Making in the British Isles*, ed. John Koster (Hillsdale, NY: Pendragon Press, 2010), 1–115; and several articles by the present author: "The Importance of the Early English Harpsichord," *Galpin Society Journal* 33 (1980): 45–73; "Towards an Optimal Instrument: Domenico Scarlatti and the New Wave of Iberian Harpsichord Making," *Early Music* 35, no. 4 (November 2007): 575–604 (also a postscript, "Scarlatti and His Keyboards," *Early Music* 37, no. 2 [May 2009]: 345–46); "Traditional Iberian Harpsichord Making in Its European Context," *Galpin Society Journal* 61 (2008): 3–78; "The Early Neapolitan School of Harpsichord Making," in *Domenico Scarlatti en España / Domenico Scarlatti in Spain*, ed. Luisa Morales (Garrucha, Almería, Spain: Asociación Cultural LEAL, 2009), 47–80; "A Harpsichord by Diego Fernández?," *Galpin Society Journal* 64 (2011): 5–48; "A Spanish Harpsichord from Domenico Scarlatti's Environs," *Early Music* 39, no. 2 (May 2011): 245–51; and "The Harpsichord in Seventeenth-Century France," in *Cembalo, Clavecin, Harpsichord: Regionale Traditionen des Cembalobaus – Symposium in Rahmen der 35. Tage alter Musik in Herne 2010*, ed. Christian Ahrens and Gregor Klinke (Munich and Salzburg: Musikverlag Katzbichler, 2011), 10–42.

[4] François Couperin, *Second Livre de pièces de Clavecin* (Paris, 1716/1717), 62, in the heading of *Les Bagatelles*.

[5] François Couperin, *L'Art de Toucher le Clavecin* (Paris, 1716; 2nd ed. 1717), 6.

too often ignored is the converse, that if a registrational resource was commonly present on instruments of a certain place and time, players in that environment would likely have used it. Makers went to considerable trouble to install such features as 4' stops, nasal registers, second manuals, buff (i.e., "harp" or "lute") stops, or even the occasional 16'. Owners of instruments with one or more of these resources must have been willing both to pay for them and to maintain them.

Perhaps because of the dearth of written documentation, but more likely because the study of registration falls among the divides of musicology, organology, and practical performance, relatively little of scholarly worth has been written on the subject as a whole.[6] Although the scope of the present article extends from the beginnings of the harpsichord as a distinctive musical medium in the early sixteenth century to its ultimate pre-revival flourishing in the second half of the eighteenth, this is not intended as a comprehensive study. I hope just to point out some of the problems, to suggest some basic guidelines grounded in the historical evidence, and to touch on some matters that might be pursued in future studies.

Considerations for Historically Informed Registration

1. Fixed Registration

Some instruments and their associated repertoires present no difficulties in choice of registration: there was none. Many Italian harpsichords from the sixteenth century and the beginning of the seventeenth had only a single set of strings. Examples are known from Naples and Venice, the two major centers of harpsichord making in Italy in that period, as well as from Rome and Florence. From the splendidly preserved anonymous Neapolitan instrument of about

[6] Among the few worthwhile treatments aiming to be comprehensive are Eta Harich-Schneider, "Registration und Dynamik," chap. 7 in *Die Kunst des Cembalo-Spiels* (Kassel: Bärenreiter, 1939), 161–78; David Fuller, "Harpsichord Registration," *The Diapason* 69, no. 8 (July 1978): 1, 6–7; and David Fuller, "Registration, §II: Harpsichord," in *The Grove Dictionary of Musical Instruments*, ed. Laurence Libin, 2nd ed. (Oxford: Oxford University Press, 2014), 4:286–91. Jan H. Siemons, *Het Gebruik van Secundaire Registers in Clavcimbelmuziek voor 1760* (M.A. thesis, Universiteit Utrecht, 1996) is an especially thorough and valuable study. A brief but notable specialized study is Kenneth Gilbert, "Le Clavecin Français et la registration," in *L'Interpretation de la musique française aux xvii^{ème} et xviii^{ème} siècles, Paris, 20–26 Octobre 1969*, ed. Édith Weber (Paris: Centre National de la Recherche Scientifique, 1974), 203–11. Much material related to Bach's registrational practice is contained in Schulenberg's *Keyboard Music of J. S. Bach*.

1530 in the National Music Museum, Vermillion, South Dakota, which has been restored to playing condition with little more than stringing and installation of a new set of jacks, it is supremely evident that harpsichords of this type are capable of rendering most beautifully the entire range of late-Renaissance keyboard music with all its different styles and textures, from the counterpoint of ricercars and intabulated motets to homophonic *frottola* arrangements,[7] early toccatas (characterized more by figuration than by gestures), and percussive dances.

Girolamo Frescobaldi's toccatas, with their dramatic rhetoric, fall somewhat flat on a single-strung harpsichord, but this composer's works, archetypes of the Baroque, were conceived for what is commonly regarded as the typical Italian harpsichord, with two 8' registers. One hesitates to say two 8' stops because it was usually difficult, in fact nearly impossible in performance situations, to turn them on or off. Although the registers could be slid on or off when the jackrail was moved out of the way, this surely would have been done only in order to tune or voice one or the other set of strings and jacks. In performance, both sets would be on at all times. Frescobaldi's music is so masterfully conceived, with varying gestures, textures, harmonic content, and control of dynamics through changes in the number of voices, that the constant registration is never tiresome.

The same could be said about Domenico Scarlatti's hundreds of sonatas. Scarlatti would have known various types of harpsichords during his international career, but the instruments most closely associated with him in his maturity were those of Diego Fernández, maker to his pupil Queen Maria Barbara and other members of the Spanish royal family. As Ralph Kirkpatrick first noted and emphasized in italics, "*The only instruments in the Queen's possession on which the full five-octave sonatas of Scarlatti could have been played were the three Spanish harpsichords with sixty-one notes and two* [eight-foot] *registers*."[8] No instruments signed by Fernández are known to exist, but a five-octave (GG to g3) 2×8' harpsichord attributable to him has recently come to light (in the Smithsonian Institution, Washington, D.C.).[9] As in the typical Italian harpsichords that Scarlatti would have known in his youth, both registers are permanently engaged. Such an instrument is in perfect accordance with what Kirkpatrick observed (but, alas, did not observe in his own performances): "Scarlatti's sonatas

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[7] The title page of Andrea Antico's *Frottole intabulate da sonare organi* (Rome, 1517) shows a harpsichord very similar to the Vermillion instrument.

[8] Ralph Kirkpatrick, *Domenico Scarlatti* (Princeton: Princeton University Press, 1953), 179.

[9] See Koster, "A Harpsichord by Diego Fernández?" and "A Spanish Harpsichord from Domenico Scarlatti's Environs."

do not seem to call for a harpsichord with a wide variety of registers; his writing itself is too colorful."[10]

2. Harpsichords as Color Machines and Organ Analogues

The primary function of registration as an aid to expression is to enrich the character of a piece. In many cases the character and consequent registration are obvious: there can be little doubt that the *Ouverture* of J. S. Bach's fourth Partita (*Clavierübung I*), for example, was intended for a full registration, or that a single 8' is appropriate for Couperin's *Le Rossignol-En-Amour* (*Quatorzième Ordre*), marked *Lentement, et tres tendrement*. Expressivity in composing for the harpsichord and playing it largely consists of detailed variations in the number of notes sounding at once, on subtle timing and rhythmic shading without resort to frequent changes of volume or timbre. There is ample historical evidence, however, that harpsichords in some places at some times were conceived rather as color machines or as analogues of organs with their multiple colorful stops. This tendency was most pronounced in Germany, where harpsichord making was largely in the hands of organ builders, just as professional harpsichord playing was mostly in the hands of organists.[11]

a. Germany

If an extended work like Frescobaldi's *Cento Partite sopra Passacagli*, played well on the unchanging 2×8' registration of a beautiful Italian harpsichord, can be heard with complete satisfaction for its full length of about twelve minutes, the same cannot be said of a work like Hans Leo Hassler's thirty-one variations on *Ich gieng einmal spatieren*.[12] Such a composition was likely conceived for instruments with a wide variety of tone color that could be changed from variation to variation. A penchant for making organs with an abundance of colorful stops had long been present in German organ building. The contract of 1509 between Hans Suys of Nuremberg (or "of Cologne" in other documents) for the Confraternity of Our

[10] Kirkpatrick, *Domenico Scarlatti*, 177.

[11] This is discussed in John Koster, "Some Remarks on the Relationship Between Organ and Stringed-Keyboard Instrument Making," *Early Keyboard Journal* 18 (2000): 95–137.

[12] The *Cento Partite* were first published in the 1637 edition of Frescobaldi's *Secondo Libro di Toccate*. Hassler's variations, edited by Georges Kiss, were published by B. Schott's Söhne, Mainz, 1971 (Edition Schott 6226).

Lady in the Church of Our Lady (now the Cathedral) in Antwerp, for example, specified, in addition to the principal chorus, a plethora of colorful stops: "two types of flutes, and hohlpipes, also schwegels, hunting horns, pipes [sounding like] little bells, trumpets, shawms, cornetts, rauschpipes, and drums, and still other unusual stops that have never been heard in organs."[13] In the famous organ, now in Frederiksborg Castle in Hillerød, Denmark, built by Esias Compenius between about 1605 and 1610 for the Duke of Braunschweig-Wolfenbüttel, the color stops almost completely displaced the principals.[14] German harpsichords of the period commonly also had a range of contrasting tone colors, most notably from the provision of a nasal register plucking near the nut.

A nasal register was already present in a harpsichord made by Hans Müller of Leipzig in 1537 (in the Museo degli Strumenti Musicali, Rome).[15] There were also two registers with normal plucking points and probably a batten with brays that could be brought near one of the two sets of strings to cause a jarring tone.[16] Sebastian Virdung referred to this effect in 1511 as present in a gut-strung clavicytherium,[17] while in the following century Michael Praetorius referred to it as the *Arpichordum* stop sometimes present in virginals.[18] German harps of the period typically had brays. Today the most familiar instance of such tone color is that of the sitar.

An anonymous clavicytherium (unlike Virdung's, certainly metal-strung) of

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[13] See Guido Persoons, *De Orgels en de Organisten van de Onze Lieve Vrouwkerk te Antwerpen van 1500 tot 1650*, Verhandelingen van de Koninklijke Academie voor Wetenschappen, Letteren, en Schone Kunsten van België, Klasse der Schone Kunsten no. 32 (Brussels: AWLSK, 1981), 151: "… twee manieren van fluten, ende hoelpijpen, nog weegelen, walthornen, scheelpipen, trompetten, schameijen, sincken, ruijspijpen, ende tamboreijnen, ende nog meer andere selsame stemmen die noijt in orgelen gehoirt geweest en sijn." See also Maarten Albert Vente, *Die Brabanter Orgel: zur Geschichte der Orgelkunst in Belgien und Holland im Zeitalter der Gotik und der Renaissance*, 2nd ed. (Amsterdam: H. J. Paris, 1963), 39. The plurals in the names did not necessarily indicate more than one register of that type but reflected the many pipes in each stop.

[14] See Michael Praetorius, *Syntagma musicum*, vol. 2, *De Organographia* (Wolfenbüttel, 1618/1619), 189; and Claus Røllum-Larsen et al., eds., *The Compenius Organ/Compenius-orglet* (Hillerød, Denmark: Det Nationalhistoriske Museum, Frederiksborg Slot, 2012).

[15] The instrument is described in Luisa Cervelli and John Henry van der Meer, *Conservato a Roma il più antica clavicembalo tedesco* (Rome: Edizioni Palatino, 1967). On early German harpsichords in general, see van der Meer, "Beiträge zum Cembalobau im deutschen Sprachgebiet bis 1700."

[16] Evidence for the batten in the Müller harpsichord is a hole in the cheekpiece through which its end would have projected. The position of the batten, between the two "normal" sets of jacks, is much too far from the nut for a buff stop.

[17] Sebastian Virdung, *Musica getutscht* (Basel, 1511), sig. B1v.

[18] Praetorius, *De Organographia*, 67.

about 1625 (in the Germanisches Nationalmuseum, Nuremberg) has three sets of 8' jacks, one nasal and two normal, plucking two sets of 8' strings, a buff stop for one of these sets, and a 4' stop. The two 8' choirs of a harpsichord of about the same date (in the Bayerisches Nationalmuseum, Munich: see Figure 1) are plucked by five sets of jacks, two nasal (one with metal plectra), two normal, one distant plucking, and there is a buff stop.[19] Harpsichords with such diverse registrational resources were doubtless common throughout the central- and south-German regions where Hassler was active.[20] Surely his long set of variations, quite lacking in harmonic color and rhythmic nuance, would gain significantly through being heard on instruments like these on which frequent dramatic changes of tone color are possible.

Coloristic tendencies remained here and there in eighteenth-century German harpsichord making. A most notable instance is the instrument for which C. P. E. Bach indicated detailed registrations in his Sonata in D-minor (W. 69), composed in 1747.[21] From these one can reconstruct the instrument's four-register disposition: lower manual with *Flöte* 8' (having a relatively distant plucking point) and *Octav* 4'; upper manual with *Cornet* 8' (the normal front 8') and *Spinet* 8' (nasal); coupler; and a buff stop for the *Cornet*. Although the *Cornet* and *Spinet* might have plucked the same strings, more likely there were three sets of 8' strings. The registrations in the final movement, a set of nine variations, are particularly imaginative, including the 8' *Cornet* with buff stop coupled to the lower-manual 4'; solo 4' accompanied by the buffed *Cornet*; and *Cornet* plus *Spinet* on the upper manual, accompanying *Flöte* plus 4' on the lower. Such playful registrations might well have been applied to the J. S. Bach's Goldberg Variations, published only six years before.

Significantly, the *Flöte*, *Octav*, and *Cornet* of the instrument in C. P. E. Bach's sonata were names of familiar organ stops. The organ's influence on harpsichord making has also long been recognized in the 16' stops occasionally found in

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[19] This instrument is decribed in John Henry van der Meer, "Ein wenig bekanntes deutsches Cembalo," *Das Musikinstrument* 37, no. 7 (July 1988): 6–10; English translation by John Koster as "A Little-Known German Harpsichord," *Early Keyboard Studies Newsletter* 5, no. 3 (March 1991): 8–13.

[20] The "harpsichord, with 4 registers, with an ivory keyboard down to GG" present in Dresden in 1681, albeit decades after Hassler's death there in 1612, was almost certainly of this type, either with four 8' stops or three plus a 4'. F. A. Drechsel, "Alte Dresdener Instrumenteninventare," *Zeitschrift für Musikwissenschaft* 10, no. 8 (May 1928): 495–99, esp. 497: "Clavizimbul, Mitt 4 Registern, mitt einem Elffenbeinern Clavire, bis ins Contra G."

[21] Edition by Darrell M. Berg in C. P. E. Bach, *Klaviersonaten, Auswahl* (Munich: G. Henle Verlag, 1986), 1:74–85.

Figure 1 *Harpsichord, maker unknown, southern Germany, about 1630 (Bayerisches Nationalmuseum, Munich; Inv.-Nr. Mu 78; photo by the author). There are five 8′ registers with widely varying plucking points eliciting sounds from nasal to flute-like.*

German harpsichords, most notably some of those made by the Hass family in Hamburg. An instance from central Germany was an instrument described in an advertisement in the *Leipziger Intelligenzblatt* of October 4, 1775:

> A four-choired harpsichord, beautifully veneered in walnut, by Zacharias Hildebrandt, is for sale. It has two keyboards from FF to f^3. In the lower manual a *Principal* 16' and *Principal* 8'. On the upper is a *Cornet* 8' and *Octava* 4'. For strengthening the bass there is a *Spinet* 8' in two octaves, borrowed from the *Cornet*. Herewith are five registers with which, by using the coupler, very many variations can be made.[22]

[22] See Herbert Heyde, "Der Instrumentenbau in Leipzig zur Zeit Johann Sebastian Bachs," in *300*

As Herbert Heyde has pointed out, this harpsichord was probably made in Leipzig before 1750, since Hildebrandt (1688–1757), active there from the mid-1730s, left in 1750 to assist Gottfried Silbermann in building the monumental organ for the Catholic Schloßkirche in Dresden.[23] During the final period of J. S. Bach's life, no instrument maker is known to have worked in closer association with him than Hildebrandt. According to Johann Friedrich Agricola, who as a student of Bach was in a position to know, the composer and the builder collaborated in making a lute-harpsichord.[24] Hildebrandt also took care of instruments in Leipzig churches, including the harpsichord at St. Thomas.[25]

The disposition of the Hildebrandt harpsichord advertised in 1775 is remarkable in several ways. First is its organ-like character, evident in four of the five stop names. Clearly the intention was to provide resources analogous to those of an organ like that in the Dresden Schloßkirche, with a 16' *Hauptwerk* "of large and massive [*gravitätische*] scaling" and an 8' *Oberwerk* "of sharp and penetrating scaling."[26] Second is the *Spinet*, presumably a nasal register on the upper manual from FF to f, acting on the same strings as the normal upper-manual 8' stop, the *Cornet*. The bass nasal stop was probably intended to act as a foil to the 16' stop, that is, to enrich the bass with bright harmonics, for the same reason that the Hass family occasionally included a 2' stop in the lower part of the compass of harpsichords with 16' stops. Third, the Hildebrandt harpsichord is extraordinary in that, except for the supplementary *Spinet*, it had the same disposition as the "Bach harpsichord" so admired by early modern harpsichord revivalists and so despised by later scholars and performers.[27]

Jahre Johann Sebastian Bach: sein Werk in Handschriften und Dokumenten, Musikinstrumente seiner Zeit, seine Zeitgenossen : eine Ausstellung der Internationalen Bachakademie in der Staatsgalerie Stuttgart, Sept. 14 – Oct. 27,1985, ed. Ulrich Prinz and Konrad Küster (Tutzing: Hans Schneider, 1985), 76: "Es stehet ein vierchörichter schön mit Nußbaum fournierter Flügel von Zacharias Hildebrand zum Verkauf. Selbiger hat 2 Claviere von contra F bis dreygestrichen F. Im Unterclaviere mit Principal 16 Fuß und Principal 8 Fuß. Auf dem obern ist ein Cornet 8 Fuß und Octava 4 Fuß. Zur Verstärkung der Bässe ist Spinet 8 Fuß in 2 Octaven von Cornet entlehnt. Hierzu sind 5 Register, mit welchen beym Gebrauche der Kuppel sehr viele Veränderungen gemacht werden."

[23] See Ulrich Dähnert, *Der Orgel- und Instrumentenbauer Zacharias Hildebrandt* (Leipzig: Breitkopf und Härtel, 1962), 121.

[24] See Jakob Adlung, *Musica mechanica Organoedi* (Berlin: Friedrich Wilhelm Birnstiel, 1768), 2:139.

[25] See Dähnert, *Der Orgel- und Instrumentenbauer*, 80.

[26] These descriptions of the scalings and their tonal effects were specified in the original contract for the organ, signed by Silbermann in 1750. See Werner Müller, *Gottfried Silbermann, Persönlichkeit und Werk: Eine Dokumentation* (Leipzig: Deutscher Verlag für Musik, 1982), 462.

[27] The "Bach harpsichord" (in the Musikinstrumenten-Museum des Staatlichen Instituts für Musik-

Hubbard wrote of the "Bach" disposition, which he regarded as historically spurious, that "The gutteral, muffled utterance of the sixteen-foot and eight-foot combination is in sad contrast to the steely fragility of the eight-foot and four-foot. … The two manuals have cruelly severed the body of the tone through the trunk. To the lower manual pertain the nether regions, and to the second manual the unsupported upper work."[28] Here passionate outrage at the heavily constructed early modern German revival harpsichords that were indeed both muffled and steely seems to have overcome logic in the analysis of the disposition *per se*. One might just as well say that the body of 2×8' tone is severed in the standard French disposition. If one disregards the 16' of the "Bach" disposition, one has, just as on French harpsichords, one manual with 8' the other with 8' and 4'. It could even be argued that with the two upper-manual stops coupled to the lower manual with its 8', the lower and upper manuals, respectively with two and three stops, are better balanced than the solo 8' on a French upper manual against the full registration on the lower. The latter registration, one against three (or even one against two if the 4' is omitted), can be problematic in such works as the outer movements of Bach's Italian Concerto and the 29th Goldberg variation. A four-register harpsichord like that called for in C. P. E. Bach's sontata would also be useful for these works. For the 29th Goldberg, designated for *1 o vero 2 Clav.*,[29] harpsichordists today usually take the single-manual option so that this

forschung Preußischer Kulturbesitz, Berlin, Kat.-Nr. 316) was once thought to have been owned by J. S. Bach, but in fact there is only a tenuous connection between the instrument and his son Wilhelm Friedemann Bach. Of the extensive literature, see, for example, in favor of the instrument, Erwin Bodky, *The Interpretation of Bach's Keyboard Works* (Cambridge, MA: Harvard University Press, 1960), 31; and contra, Hubbard, *Three Centuries*, 184 and 331–33; and Ralph Kirkpatrick, "Fifty Years of Harpsichord Playing," *Early Music* 11 (1983): 37. More recently, the instrument, with its unusual disposition, has been partially rehabilitated as an authentic Central-German harpsichord from Bach's lifetime: see Dieter Krickeberg and Horst Rase, "Beiträge zur Kenntnis des mittel- und norddeutschen Cembalobaus um 1700," in *Studia Organologica: Festschrift für John Henry van der Meer zu seinem fünfundsechzigsten Geburtstag*, ed. Friedemann Hellwig (Tutzing: Hans Schneider, 1987), 294–302; and Konstantin Restle and Susanne Aschenbrandt, eds., *Das Berliner "Bach-Cembalo": Ein Mythos und seine Folgen*, exhibition catalog (Berlin: Musikinstrumenten-Museum des Staatlichen Instituts für Musikforschung Preußischer Kulturbesitz, 1995). Now attributed to Johann Heinrich Harrass (1665–1714) of Großbreitenbach (or to one of his sons), the instrument appears originally to have been made with a 16' stop, not with a third set of 8' strings, as Hubbard concluded.

[28] Hubbard, *Three Centuries*, 184.

[29] Editors usually amend this designation, also found in the the other variations with the option of one- or two-manual registration (the 5th and 7th), to *1 ovvero 2 Clav.* Perhaps, however, with *o* sufficient to mean "or" in Italian, Bach intended *vero* to mean, as in Latin, "in truth" thus indicating his basic conception of these movements for two-manual performance.

climactic variation can sound with a full registration rather than with a single 8' on each manual. More substantial two-manual registrations are available with the "Bach" disposition (even without its 16') or with that of C. P. E. Bach's instrument: on the latter, for example, *Cornet* plus *Spinet* on the upper against *Flöte* plus *Octav* on the lower.

Mozart wrote to his father in 1781, "We have two harpsichords [*Flügel*] in my residence, one for playing *Galanterie* and the other a machine with a lower octave throughout [i.e., with a 16' stop], like the one we had in London[!], therefore like an organ. On this, then, I've improvised and played fugues."[30] Although the term *Flügel*, referring to the form of the instruments, admits the possibility that the first of these had a hammer action, it, more suitable for lighter repertoire than the second instrument, was doubtless lighter in tone. Likely a similar matching of repertoire and instrument had long been customary. When more than one instrument was available, the one with a 16' would be used for organlike repertoire—toccatas, fugues, and the like—while smaller instruments would be used, say, for pieces like J. S. Bach's French suites. When playing dance movements or other lighter fare on a large harpsichord, the 16' would be left off. If today's performers with intentions of being historically informed could come to regard the 16' stop as frankly organlike, not as a relic of Landowska's Pleyel, perhaps it would become more palatable for them.[31]

b. England

In general, the masterfully and subtly wrought works of the English Elizabethan and Jacobean composers (the "Virginalists") are inherently interesting and would seldom become tedious on the constant registration of contemporary single-8' or 2×8' Italian harpsichords. Indeed, it has often been thought that the early English

[30] Ludwig Nohl, ed., *Mozarts Briefe* (Salzburg: Verlag der Mayrischen Buchhandlung, 1865), 302: "Wir haben in meiner Wohnung 2 Flügel, einen zum Galanteriespielen und der andere eine Machine, der durchgehends mit der tiefen Octav gestimmt ist, wie der, den wir in London hatten, folglich wie eine Orgel. Auf diesem habe ich also capricirt und Fugen gespielt." For the translation of *capricirt* as "improvised" refer to Mozart's *Capriccio*, K. 395, basically a written-down unmeasured improvisation, what C. P. E. Bach would call a *freye Fantasie*. The Prelude and Fugue K. 394, composed in April 1782, is likely the result of Mozart's experimentation on this 16' harpsichord.

[31] The prevailing attitude is presented in Ann Bond, *A Guide to the Harpsichord* (Portland, OR: Amadeus Press, 1997), where one reads (p. 25) that the 16' register "is of dubious authenticity, although it was popular on post-war revival instruments [and pre-war, one might add]…. But the addition of sixteen-foot tone tends to congest the contrapuntal texture…."

harpsichordists relied mainly on instruments imported from Italy or Flanders.[32] English works, however, even those made available to the general public in *Parthenia* (London, 1612/1613), the collection of pieces by William Byrd, John Bull, and Orlando Gibbons, frequently contain the low accidentals absent from the short-octave keyboards of virtually all continental instruments of the period. Thus, these works must usually have been played on English harpsichords and virginals, which commonly had chromatic bass compasses.[33] The two known English harpsichords of this period, by Lodewijck Theewes, London, 1579 (in the Victoria and Albert Museum, London), and John Hasard, London, 1622 (in Knole House, Sevenoaks, Kent), each have three sets of strings and jacks.[34] The former was disposed 2×8' + 4'; one of the 8' choirs evidently had permanently engaged brays. The Hasard harpsichord was disposed 8' + 2×4', although, depending on whether the lowest note of the missing keyboard was C or GG, the pitch level might have been as much as a fourth below "normal" 8' pitch. (For present purposes, normal pitch can be defined as a^1 ranging from about 385 to 465 hz.) One of the 4' stops probably had a close plucking point (i.e., was a nasal register). Thus, both the Hasard and Theewes harpsichords, even without the five-stop organ to which the latter was attached, could provide a wide variety of tone color. Although doubtless an individual pavane or galliard would have been played with a fixed registration, players likely exploited the range of registrational possibilities in sets of variations and other long forms. Surely a diversity of colors, some of the more exotic being imitative of flutes, bagpipes, or trumpets, would have heightened the effectiveness of Byrd's harmonically static *Battell*, in which there are convenient opportunities to manipulate stops between the numerous movements. Some English fantasias are divided into sections ending cleanly with block chords at which one could add or subtract a stop.[35]

The apparent English penchant for colorful harpsichords evidently lasted

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[32] Hubbard, *Three Centuries*, 133: "One must assume that the majority of instruments in use in England at the time [16th c.] were imported, first from Italy and later from Flanders."

[33] See John Koster, "The Importance of the Early English Harpsichord." A more detailed view of English compasses is in Davitt Moroney, "Bounds and Compasses: The Range of Byrd's Keyboards," in *Sundry Sorts of Music Books: Essays presented to O. W. Neighbour on his 70th Birthday*, ed. C. S. Banks et al. (London: The British Library, 1993), 67–88.

[34] These are described in Koster, "The Importance of the Early English Harpsichord"; Malcolm Rose, "Further on the Lodewijk Theewes Harpsichord," *Galpin Society Journal* 55 (2002): 279–309; and Darryl Martin, *The English Virginal* (Ph.D. diss., University of Edinburgh, 2003), 324–53.

[35] See, for example, Byrd, *My Lady Nevells Booke*, no. 36 (mm. 15–16) and no. 41 (mm. 24–25); and Giles Farnaby, *Fitzwilliam Virginal Book*, no. 129 (mm. 36–37 and 49–50) and no. 232 (between the 25th and 24th measures from the end).

into the Restoration period. An instrument by Charles Haward, London, 1683 (in Hovingham Hall, North Yorkshire), had, according to Darryl Martin's recent analysis of its original state, two sets of 8' strings plucked by three sets of jacks, two of them nasal registers.[36] Also devised in this period was the "Pedal," a harpsichord with foot-controlled stops invented by John Hayward, likely a close relative of Charles Haward. All that is known of this instrument, which had as many as 24 different registrations, is the description in Thomas Mace's *Musick's Monument* (London, 1676).[37] Frank Hubbard concluded that the instrument would have had a single manual with three 8' stops (one of them nasal), a 4', and a buff.[38] Most of the surviving English harpsichords from about 1700 to 1725 have just two 8' stops on a single manual.[39] Beginning, however, no later than 1721, the date of a two-manual harpsichord made in London by Hermann Tabel (in the County Museum, Warwick),[40] the classic English disposition as made until the end of the century by the Kirckman and Shudi-Broadwood firms came to the foreground: 8' and 4' on the lower manual, a dogleg 8' played by both manuals, and an 8' nasal register on the upper, plucking the same set of strings as the dogleg. Although not yet present in the Tabel harpsichord, there was normally also a buff stop for one of the 8' choirs.

c. The Low Countries

At first, the instruments made by the Ruckers family and their colleagues in Antwerp from about 1580 to the middle of the following century appear to offer a much smaller tonal palette than the English and German harpsichords mentioned above. With only one known exception before the 1640s, Ruckers harpsichords were invariably strung with only two choirs, an 8' and a 4', and single-manual instruments had only two registers.[41] Doubles had four registers, an 8' and a 4'

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[36] See Martin, "The Native Tradition in Transition," 27–49.

[37] Thomas Mace, *Musick's Monument* (London, 1676), 235–36.

[38] Hubbard, *Three Centuries*, 147–48. Another possibility would be 4×8' plus buff. Each stop did not necessarily have a separate set of strings.

[39] See Martin, "The Native Tradition in Transition," *passim*.

[40] See Charles Mould, "The Tabel Harpsichord," in *Keyboard Instruments: Studies in Keyboard Organology, 1500–1800*, ed. Edwin M. Ripin (Edinburgh: Edinburgh University Press, 1971), 57–63.

[41] For a detailed survey of the Ruckers/Couchet oeuvre, see O'Brien, *Ruckers*. The exceptional instrument (in an American private collection), made in 1635 by Joannes Ruckers as a single-manual with 2×8' + 4' stringing and three registers, was, as shown by the working plan scribed on its bottom board, a special production.

on each keyboard, but with both 8' registers plucking one set of strings and both 4' registers plucking the other set. Because there would be damper interference between the upper- and lower-manual jacks if both were engaged simultaneously, the two keyboards, which, moreover, were arranged to play at different pitches, could not be used simultaneously. Thus the doubles were essentially two singles, one a fourth lower than the other, within the same case.

Viewed more broadly, however, the standard Ruckers harpsichords did offer considerable variety of tone color. Three timbres were available by using each register separately or both together. Also, there was a buff stop for the 8'. Buff stops are seldom used by today's harpsichordists, who perhaps regard the effect as too gimmicky. Buffs, however, were present as a standard feature of Ruckers harpsichords and in many others made throughout northern Europe—available, it would have been used. One could imagine that even the registration of buffed 8' plus 4' had its occasional appeal. Although long after the Ruckers, it is relevant at least in a general sense that C. P. E. Bach specified this registration for the left hand in one of the variations in the Sonata in D-minor mentioned above.

That Ruckers buff stops were divided between bass and treble—in singles and the lower manual of double at f^1/f-sharp^1, on the upper manual of doubles at c^1/c-sharp^1—further increased the registrational possibilities. Although it would have been easy for players using divided registrations to avoid crossing one hand or the other over the split while improvising, opportunities for using these registrations are relatively rare in the written repertoire historically appropriate for Ruckers harpsichords in their original state. One can point to a few simple Dutch pieces from the middle of the seventeenth century[42] and some from north-German followers of Sweelinck,[43] with right-hand melodies not extending below f-sharp^1 and with left-hand accompaniments that could be buffed. Many other similar pieces could be played with license (a matter of course in the seventeenth century) to make minor adjustments to the musical

[42] These, in Alan Curtis, ed., *Nederlandse Klaviermuziek uit de 16e en 17e Eeuw*, Monumenta Musica Neerlandica 3 (Amsterdam: Vereniging voor Nederlandse Muziekgeschiedenis, 1961), are *Droevige Princesse* (pp. 61–62), *Engles Voishe* (pp. 65–66), *Courante* (p. 66), *Pavana Hispania* (pp. 70–71), *Ballet Bronckhorst* (p. 72), and *De Engelsche Fortuijn* (p. 77). In fairness, it must be noted that there are many similar pieces from the same sources in which the right hand part goes below f-sharp^1.

[43] These include one of a set of anonymous variations on *Windecken daer het bosch af drilt*, in Werner Breig, ed., *Lied- und Tanzvariationen der Sweelinck-Schule* (Mainz: B. Schott's Söhne, 1970), Edition Schott 6030, 14–15, and a setting of *Amarillis* in the Hinze Manuscript, stemming from Sweelinck's grand-pupil Matthias Weckmann, published in Siegbert Rampe's edition of Weckmann's *Sämtliche freie Orgel- und Clavierwerke* (Kassel: Bärenreiter, 1991), 75.

text. Ruckers harpsichords were also well known in Spain,[44] where organ stops were commonly divided at c¹/c-sharp¹: the many seventeenth-century Spanish organ *tientos de medio registro* conceived for divided registration could have been played with the treble or bass buff stop on the upper manual of a Ruckers double.

The range of colors available on Ruckers harpsichords is all the greater when one counts the lower-manual registers of the doubles. Even without taking into consideration that these sounded a fourth below normal 8' pitch, in itself a type of timbral variety, these registers, with their more distant plucking points, have a much rounder tone than those of the upper manual or of single-manual instruments. It should also be remembered that a large part of the Ruckers oeuvre consisted of two types of virginals, the flute-toned *muselars* with strings plucked near their midpoints and the nasal *spinetten* with close-plucked strings. *Muselars*, in addition, had an *arpichordum* stop in the bass. Both types of virginals, moreover, were often made together with octave virginals to form mother-and-child instruments. In these, the child, at 4' pitch, could be coupled to the mother at 8'.[45] To be sure, the various Ruckers tone colors were never all available within one instrument. Because, however, members of the aristocracy and wealthy amateurs often owned multiple instruments,[46] one could register, in a way, by moving from one to another.

The predilection for varied tone colors persisted in Netherlandish harpsichord

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[44] A Ruckers single-manual harpsichord of 1601, for example, has been discovered in Segovia Cathedral: see the description by Cristina Bórdas Ibáñez in *La Música en la Iglesia de Castilla y León*, exhibition catalogue (Valladolid: Fondación Las Edades del Hombre, 1991), 220–21.

[45] See John Koster, "The Mother and Child Virginal and Its Place in the Keyboard Instrument Culture of the Sixteenth and Seventeenth Centuries" in *Colloquium, Ruckers klavecimbels en copieën: universele instrumenten voor de interpretatie van de muziek uit Rubens tijd, Antwerpen, Museum Vleeshuis, 30 september-2 oktober 1977*, ed. J. Lambrechts-Douillez (Antwerp: Ruckers Genootschap, 1978); also issued as *Brussels Museum of Musical Instruments Bulletin* 7 (1977): 78–96 (same page numbers in both editions).

[46] For example, Jacques Snel, an Antwerp wine merchant who died in 1623, owned:

- a claviorgan
- a *steertstuck* (harpsichord)
- an *ordinaris clavecimbel* (virginal) by Ruckers
- a *dobbel clavecimbel* (mother and child) by Ruckers
- another *dobbel clavecimbel* (mother and child) by Ruckers
- a *cleyn instrumentken* (octave virginal or clavichord?).

In the nomenclature of the period, *clavecimbel* normally meant the rectangular form, i.e., virginal, while *steertstuck* (tail-piece) meant harpsichord. Possibly one of the *dobbel clavecimbel* mothers was a *muselar*, the other a *spinett*. The document is included in Jeannine Lambrechts-Douillez, "Documents Dealing with the Ruckers Family and Antwerp Harpsichord-Building," in *Keyboard Instruments: Studies in Keyboard Organology, 1500–1800*, ed. Edwin M. Ripin (Edinburgh: Edinburgh University Press, 1971), 39–43.

making after the demise of the Ruckers family and the obsolescence of their standard models in the second half of the seventeenth century. Already in one of the last known Ruckers-family harpsichords, a single made by Joseph Joannes Couchet in 1679 (in the National Music Centre, Calgary, Alberta, Canada), strung with the usual single 8' and 4', the 8' strings are plucked by two sets of jacks with closer and farther plucking points.[47] A harpsichord originally made as a single by Joris Britsen III in Antwerp, 1681 (in the Museum Vleeshuis, Antwerp), had the usual two registers, an 8' and a 4', and in a separate gap near the 8' nut, an 8' nasal register plucking its own set of strings.[48] A harpsichord made with a nasal register in the northern Netherlands in 1658 is described below. Nasal registers were also a standard component of the doubles made in Antwerp by Johann Daniel Dulcken in the 1740s and 1750s.[49]

Quirinus van Blankenburg's account of his alterations to a Ruckers double in 1708 provides some insight into how the various registers were regarded.[50] He offered two nomenclatures for the four registers: *Spinetta* for the nasal 8', *Unisonus* for the upper-manual 8' (probably doglegged to the lower manual), *Cymbalum* for the lower 8', and *Octava* for the 4'; or, "to speak organwise," *Trompet*, *Bourdon*, *Prestant*, and *Octaaf*. The second set of names shows the relationship to the organ aesthetic, while the use of *Spinetta* suggests that the still-prized tone quality of the obsolescent *spinett* type of virginal was grafted into the harpsichord. In any case, van Blankenburg noted that "in order to be able to surprise the listener more quickly through unexpected changes we brought the stops to the front so as to be able to move them while playing with a motion of the hand."[51] Further, van Blankenburg was the only known historical composer other than C. P. E. Bach to specify the buff stop for a piece: a curious set of *Airs á 2 Trompettes*, essentially D-major fanfares to be played on the harpsichord by the right hand (to be played on the *Trompet* of the composer's harpsichord, the nasal stop?), accompanied by the left hand in the bass imitating tympani by playing A and d

[47] See O'Brien, *Ruckers*, 274–75.

[48] See John Koster, "Two Antwerp Harpsichords from the Second Half of the Seventeenth Century," *Mededelingen van het Ruckers-Genootschap* 8 (2009): 105–27.

[49] See Jean Tournay, *Archives Dulcken* (Brussels and Tutzing: Musée Instrumental and Hans Schneider, 1986), 1:20–24 and *passim*. (No vol. 2 was issued.)

[50] Quirinus van Blankenburg, *Elementa Musica* (The Hague: Laurens Berkoske, 1739), 145.

[51] As translated in Hubbard, *Three Centuries*, 239.

on the buff (*Luth*) stop.[52] This surely was a special case, but performers must on occasion have used the buff stop for more conventional repertoire.

3. "Quicker and sharper than the unison": The Importance of Four-Foot Stops

Since the 1960s, a common conception among harpsichordists has been that, as one tutor puts it, "A genuine tutti effect on the harpsichord is best obtained by the blending of two… 8-foot registers" synergistically interacting, as in a good instrument.[53] Another tutor goes so far as to list 4' stops as "extraneous to the essential 8' stop design."[54] I once attended a series of harpsichord performances during a week-long European festival throughout which a 4' stop was never to be heard.[55] Be that as it may, harpsichord makers of many prominent historical schools routinely included 4' stops in their instruments—the Ruckers family and their contemporaries in the Low Countries; the later Flemish makers such as J. D. Dulcken; the seventeenth- and eighteenth-century French; Kirckman, Shudi, and others in London from the 1720s to the end of the century; the Fleischer and Hass families in Hamburg; and those working in Valladolid in the first half of the eighteenth century. Although French makers in the latter half of the seventeenth century and the eighteenth occasionally made single-manual harpsichords with just two 8' stops, these, perhaps intended mainly for accompanying other performers, were exceptional: the two-manual instruments predominating their production always had a 4' stop. Likewise, while some Kirckman and Shudi single-manual harpsichords are disposed 2×8', other singles and all their doubles include the 4'. To my knowledge, there is no authentic historical two-manual harpsichord of any school without a 4' stop. Obviously, all these makers regarded the 4' as an integral part of the harpsichord, without which the instrument was incomplete.

As already noted, Ruckers-family harpsichords were almost invariably made with just a single 8' and a 4', such that the latter was an essential constituent of the full ensemble. One of the few exceptions proves the rule. In 1648 Constantijn

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[52] See Siemons, *Het Gebruik van Secundaire Registers*, 47 and 82, with a facsimile of the original source.

[53] Howard Schott, *Playing the Harpsichord* (London: Faber and Faber, 1971), 183.

[54] Richard Troeger, *Technique and Interpretation on the Harpsichord and Clavichord* (Bloomington and Indianapolis: Indiana University Press, 1987), 195.

[55] When I remarked about this to a certain fortepiano maker, he replied "mosquitoes."

Huygens, secretary to the Prince of Orange, stadtholder of the Netherlands, purchased a single-manual harpsichord from Jan Couchet, nephew and successor of Joannes Ruckers. The specially commissioned instrument was disposed with unisons, that is, 2×8'. Along with the instrument, Couchet sent to Huygens in the Hague a letter, which he ended by recommending that "if the occasion should ever arise again, that I should have to make another for a music lover, I would advise him to have the same to be made with an octave [i.e., a 4']; that would be my wish. This goes quicker and sharper than the unison, it is sweet and lovely in sound, then your honour would hear the difference."[56]

The 8' plus 4' chorus was available not only on Ruckers harpsichords but also on their mother-and-child virginals, which formed a considerable portion of their surviving oeuvre—about fifteen percent (likely more originally, as harpsichords were more liable to remain in use and to be preserved). That the child would often have been played alone at 4' pitch reminds us that the 4' stop of Ruckers harpsichords would also have been played solo. Sixteenth- and early seventeenth-century lists of appropriate registrations for organs in the Netherlands and nearby regions of Germany suggest that playing at 4' pitch was not infrequent.[57]

Marin Mersenne's *Harmonie Universelle* (Paris, 1636–37) includes a fine, realistic engraving of a single-manual harpsichord which, since it does not quite resemble the instruments of other schools, presumably represents a typical French instrument of the period.[58] Like Ruckers harpsichords, it was disposed with a single 8' and 4'. Harpsichords with the same disposition were probably also common in Spain, although the earliest known dated example was made in 1712.[59] Thus, the 4' as the only complement to a single 8' was an essential component of harpsichords not just in Antwerp, but also in other significant musical traditions.

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[56] Translation from O'Brien, *Ruckers*, 306. A facsimile, transcription, and translation is in Edwin M. Ripin, "Antwerp Harpsichord-Building: the Current State of Research," in *Colloquium: Restauratieproblemen van Antwerpse Klavecimbels, Museum Vleeshuis 10 tot 12 mei 1970* (Antwerp: Ruckers Genootschap, 1971), 12–23, esp. 20–22. The original text is also available on the website "Circulation of Knowledge and Learned Practices in the 17th-century Dutch Republic," at http://ckcc.huygens.knaw.nl/epistolarium/letter.html?id=huyg001/4851 (accessed November 3, 2015).

[57] See Chapter 15 of Maarten Albert Vente, *Die Brabanter Orgel: zur Geschichte der Orgelkunst in Belgien und Holland im Zeitalter der Gotik und der Renaissance*, 2nd ed. (Amsterdam: H. J. Paris, 1963).

[58] Marin Mersenne, *Livre Troisiesme des Instrumens à chordes*, in *Harmonie Universelle* (Paris, 1636–37), 2:111; reproduced in Hubbard, *Three Centuries*, plate X; and Koster, "The Harpsichord in Seventeenth-Century France," 16.

[59] See Koster, "Traditional Iberian Harpsichord Making."

The 4' also had its place in early Italian harpsichord making. As mentioned above, many sixteenth-century Italian harpsichords were single-strung at 8' pitch, but when a second stop was included it was typically a 4', not a second 8'. Although some of these 8'+4' harpsichords were of moderate size and scaling suitable for tuning fairly close to the lower region of normal pitch,[60] most of the Venetian harpsichords made with this disposition were large, long-scaled instruments.[61] It is now often thought that these instruments were strung in iron and tuned to normal pitch,[62] but they might well have been strung in brass and tuned about a fourth lower. This, however is not the place to pursue such matters of stringing and pitch, except to note that with the alternative of stringing in brass the 4' would serve nicely as a foil to the low pitch of the 8'.

The large Venetian harpsichords were usually made with the compass extending up to f^3. Because there is relatively little repertoire requiring the highest notes,[63] they might mainly have been used so that pieces including bass F-sharp or G-sharp, which were lacking on the C/E short-octave keyboards, could be played an octave higher. In many such sixteenth-century Italian pieces, the notated music does not extend above f^2.[64] In Spain this practice of playing pieces with F-sharp or G-sharp in the bass an octave higher was explicitly recommended by Juan Bermudo,[65] and his pieces including these bass accidentals could, because of their limited upward range, all be played an octave higher.[66] Even without the

[60] See, for example, a Neapolitan harpsichord in the Museum of Fine Arts, Boston, described in John Koster, *Keyboard Musical Instruments in the Museum of Fine Arts, Boston* (Boston: Museum of Fine Arts, 1994), 3–15. The instrument is 1915 mm long. Its original scaling, with c^2 about 300 mm long, is consistent with brass strings tuned about a whole tone below modern pitch.

[61] For example, the Trasuntino harpsichord of 1531 in the Royal College of Music, London, is 2227 mm long. With an estimated original c^2 length of 356 mm (see Elizabeth Wells, ed., *Royal College of Music Museum of Instruments, Catalogue Part II: Keyboard Instruments* [London: Royal College of Music, 2000], 29), it would, if strung in brass, have been tuned approximately a fourth below modern pitch.

[62] See Ralph Denzil Wraight, *The Stringing of Italian Keyboard Instruments c.1500–c.1650* (Ph.D. diss., The Queen's University of Belfast, 1996; rev. 1997), 1:227–36.

[63] The *Recercare Secondo* in Marco Antonio Cavazzoni's *Recerchari Motetti Canzoni* (Venice, 1523) extends up to f^3.

[64] An example is a ricercar in the third tone attributed to Giaches Brumel, the third piece in Anthony Newcomb, ed., *The Ricercars of the Bourdeney Codex*, Recent Researches in the Music of the Renaissance 89 (Madison, WI: A-R Editions, 1991). It includes several bass G-sharps, while the highest note in the treble is e^2.

[65] Juan Bermudo, *Declaración de instrumentos musicales* (Osuna, 1555), fol. 90.

[66] Transcriptions of these pieces in Bermudo's *Declaración* are in Paloma Otaola González, *Tradición y modernidad en los escritos musicales de Juan Bermudo* (Kassel: Edition Reichenberger, 2000),

necessity of accommodating bass accidentals, players might have extended the timbral resources of their instruments playing an octave higher. Playing the 8' in this manner would provide a second 4', and playing the 4' thus would introduce a 2' voice. For that matter, players might occasionally also have played notated music an octave lower.[67]

As for the latter part of the seventeenth century and the eighteenth, when a second 8' register became *de rigeur* in all northern-European harpsichord-making schools, the 4' (except in Vienna and, briefly, in London[68]) continued to be included in all but the most modest instruments. Surely it was regarded as an essential element of the instrument's tonal ensemble. To play an entire harpsichord program of Sweelinck, Couperin, or Bach without using the 4' is like playing a program of their organ works without using a mixture stop.

4. The Use of Two Manuals

The earliest firm evidence for the existence of two-manual harpsichords with keyboards at the same pitch and playable simultaneously stems from France in the 1640s. This is found in the first edition, published in Paris in 1643, of the *Traité de l'accord de l'espinette* by the harpsichord maker and organist Jean Denis II, who wrote that "there are harpsichords with two keyboards for passing all the unisons."[69] That is, these were harpsichords on which one can play *pièces croisées* with two separate 8' stops, one on each keyboard. This type of harpsichord cannot

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440–42; and in Javier Artigas Pina's edition of Bermudo, *Obras para teclada*, Cuadernos de Daroca 2 (Zaragoza: Institución "Fernando el Católico," 2005), 93–96.

[67] An explicit late example is Pancrace Royer's suggestion that, in its final repetition one could play the *petite reprise* of *Les tendres Sentiments* (*Pièces de Clavecin, Premier Livre*, 1746) an octave lower: "La seconde et derniere fois que l'on dit la petite Reprise B. on peut la jouer une Octave plus bas pour finir." Echos notated at the lower octave were not uncommon, as in the examples by Sweelinck and Peter Phillips mentioned below. The last two measures of the A-section of Balbastre's *La De Caze* (*Pièces de Clavecin, Premier Livre*, 1759) are a lower-octave echo of the previous two measures.

[68] Harpsichords made in Vienna from the late seventeenth century to the late eighteenth, and in London from about 1690 to the 1720s, typically had only one manual with two 8' stops. See Huber, *Das österreichische Cembalo*; and Martin, "The Native Tradition in Transition."

[69] Translation from Hubbard, *Three Centuries*, 123. Hubbard cited the 1650 edition of the *Traité*, where the passage is on p. 13. The same wording is found on p. 17 of the 1643 edition: "ayant des Clavecins à deux Claviers, pour passer tous les Unisons." I am most grateful to Christian Péligry, Director of the Bibliothèque Mazarine, Paris, for sending me a photocopy of the relevant pages of this library's unique copy of the first edition. There is a facsimile edition of the 1650 edition (New York: Da Capo Press, 1969), and a translation by Vincent J. Panetta, published as *Treatise on Harpsichord Tuning* (Cambridge: Cambridge University Press, 1987).

have been developed too many years earlier, as in 1648 it was described in a letter written to Constantijn Huygens by the royal organist Pierre de La Barre, who referred to its unnamed inventor as "still young" (*encore jeune*).[70]

The modern nomenclature applied to these instruments bears examination. Frank Hubbard called this type the "expressive two-manual harpsichord" or "expressive double harpsichord," which he defined in 1965 as "a two-manual harpsichord in which the extra manual is used to vary the dynamic level or timbre rather than for transposition."[71] Since, however, expression in playing the harpsichord is achieved primarily by subtleties of touch while playing on one keyboard, the term "contrasting double," introduced a few years later by Edwin M. Ripin seems preferable.[72] Also significant is Ripin's clarification of the definition to specify that it be "possible to make rapid contrasts of volume and timbre," or, one might add, also possible to play on the two keyboards simultaneously.

Whether the *clavecin ayant deux claviers* listed in 1636 among the possessions of Claude Gaultier, a Parisian official,[73] was already a contrasting double is indeterminable. It might well have been a transposing double imported from Antwerp. Likewise, Mersenne's remark, also from the mid-1630s, about harpsichords with two or three keyboards and seven or eight *jeux*,[74] that is, stops or combinations of stops, is consistent with the registrational resources of Ruckers transposing doubles, in which a third keyboard was sometimes present in a virginal built into the hollow of the bentside.

The only stringed-keyboard instruments with two simultaneously playable keyboards that are unquestionably known to have existed before 1643 were mother-and-child virginals. Although all but one of the surviving examples were made in Antwerp—one English child (bereft of its mother) by Thomas White, London, 1638, is known[75]—there is documentary evidence of such instruments

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[70] Original text in W. J. A. Jonckbloet and J. P. N. Land, *Musique et musiciens au XVII^e^ siècle: correspondance et œuvre musicales de Constantin Huygens* (Leiden: E. J. Brill, 1882), cxlix-cxl; translation in Hubbard, *Three Centuries*, 232–33.

[71] Hubbard, *Three Centuries*, 105 and 350.

[72] Edwin M. Ripin, "The Two-Manual Harpsichord in Flanders Before 1650," *Galpin Society Journal* 21 (1968): 33–39.

[73] Madeleine Jurgens, *Documents du Minutier Central concernant l'histoire de la musique (1600–1650)* (Paris: S.E.V.P.E.N., [1968]), 1:888.

[74] Mersenne, *Livre Troisiesme des Instrumens à chordes*, in *Harmonie Universelle*, 2:112.

[75] See *Made for Music: an Exhibition to Mark the 40th Anniversary of the Galpin Society for the Study of Musical Instruments*… (London: The Galpin Society, 1986), no. 177.

in Germany and Italy.[76] When the mother and the child were used together, with the child coupled to the mother, the mother's keyboard, functioning as the lower manual, had the fixed registration of 8' plus 4' (with the possibility of the *arpichordum* in the bass of *muselars*) while the 4' child functioned as the upper manual. The performance possibilities on these instruments include alternating keyboards for repeats or from section to section of a set of variations; using the child to accompany a solo voice on the lower keyboard; and playing echoed phrases on the child. In this last use, in pieces where, as was often the case, echoes were notated an octave lower than the primary statement, the echo, played on the 4' child, will sound at the same pitch.[77] Much the same could be done if one, as Praetorius mentioned, stacked an octave virginal on top of a larger instrument.[78]

Ripin pointed to several paintings by Antwerp artists from the 1610s and 1620s that depict two-manual harpsichords with aligned keyboards.[79] Even under the assumption that these accurately represent actual instruments, they were unlikely contrasting doubles, as Ripin defined them. There is a third possible type of two-manual harpsichord in addition to transposing and contrasting doubles. The version of this third type that is easiest to imagine is an instrument like a Ruckers transposing double, that is, with two sets of strings and four sets of jacks, an 8' and a 4' on each keyboard, but with the two keyboards aligned to play at the same pitch. Because of interference between the dampers of the two sets of jacks plucking the same set of strings, registers of the same pitch could not be engaged simultaneously on the two keyboards. Basically, one would have the equivalent of two independent single-manual harpsichords with different tone qualities resulting from the different plucking points. The advantage of this disposition over merely making all four sets of jacks playable from a single manual is that the action would be lighter and that the balance points of the keys could be optimally placed for each pair of 8' and 4' stops. There are, in fact, several extant

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[76] See Koster, "The Mother and Child Virginal"; and Francesco Nocerino, "Evidence for Italian Mother-and-Child Virginals: An Important Document Signed by Onofrio Guarracino," *Galpin Society Journal* 53 (2000): 317–21.

[77] See, for example, measures 75 and following in Sweelinck's *Echo Fantasia* (Fantasia C1 in the list in Pieter Dirksen, *The Keyboard Music of Jan Pieterszoon Sweelinck* [Utrecht: Koninklijke Vereniging voor Nederlandse Muziekgeschiedenis, 1997], 641). The echoes in mm. 17–25 and 29 in the seventh section of Peter Phillip's *Passamezzo Pavana* (*Fitzwilliam Virginal Book*, no. 76) could also be played in this manner.

[78] Praetorius, *De Organographia*, 62.

[79] Edwin M. Ripin, "The Two-Manual Harpsichord in Flanders Before 1650," *Galpin Society Journal* 21 (1968): 33–39.

harpsichords of this type, albeit in the form of Ruckers transposing harpsichords, in which the lower keys were later rearranged to play at the same pitch as the upper manual.[80] I have called this type the "non-simultaneous contrasting double."[81] One should note, however, that the 8' of one keyboard and the 4' of the other could be played simultaneously. In any case, if such harpsichords existed at all in the first half of the seventeenth century they must have been very rare. For the practical purposes of historically informed performance it would be best to assume that no repertoire from before the middle of the seventeenth century was originally conceived for any sort of contrasting two-manual harpsichord.

a. France

An inventory of the workshop of the Parisian maker Jean Jacquet in 1632 included two harpsichords, one with a single set of strings, the other with 100 strings.[82] The latter, surely with two sets of fifty strings, would correspond with the instrument shown by Mersenne, with its 8' + 4' disposition. La Barre's letter of 1648 concerning the new French contrasting doubles described them as being like "two harpsichords joined together." If one imagines a single-strung harpsichord at 8' pitch set atop a harpsichord like Mersenne's the result is something like the standard French two-manual disposition, as found in the earliest known surviving French harpsichord (in the Musée de l'Hospice Saint-Roch, Issoudun), made by Jean Denis II in 1648, with its three sets of strings and three registers, presumably arranged originally, as now, with 8' and 4' on the lower manual, and 8' on the upper. The instrument also has a shove coupler now operated by shifting the upper manual but perhaps originally by shifting the lower manual. Since, however, the coupler dogs on the original keys are identical in workmanship to those on several keys added to the compass about 1700, there is no real evidence that the Denis harpsichord had a coupler at all. The maker himself, in his *Traité*, emphasized that one could "pass the unisons," not that one could play them coupled.

The next oldest French harpsichord, made by Claude Jacquet in 1652, almost

[80] For example, the instrument by Andreas Ruckers, 1640, in the Hôtel de Croix, Namur. See O'Brien, *Ruckers*, 266.

[81] John Koster, "A Netherlandish Harpsichord of 1658 Reexamined," *Galpin Society Journal* 53 (2000): 117–39, esp. 118–22.

[82] Colombe Samoyault-Verlet, *Les Facteurs de clavecins Parisiens: notices biographiques et documents (1550–1793)* (Paris, Société française de musicologie, Heugel et Cie, 1966), 93.

certainly had a coupler operated by shifting the lower manual.[83] In the uncoupled position, with the keyboard shoved back, the front surface of the endblocks fixed to the case and the moveable endblocks on the keyframe are flush. When the keyboard is slid forward for coupling, the endblocks attached to the keyframe protrude beyond the fixed block. This visual irregularity suggests that the uncoupled state, with these front surfaces flush, was what one might call the "default" registration. The normal *plein jeu*, to adopt organ terminology, might therefore in this period have been the lower-manual 8' and 4'. The discernable preference for light, single-8' registrations is paralleled by the very delicate keys and other action parts of seventeenth-century French harpsichords. Voicing was probably very light. All of this would allow a fluent, effortless playing technique. Registrations involving the coupler might mostly have been reserved for accompaniment.

Frank Hubbard, mainly on the basis of an unsigned harpsichord formerly in the collection of Eugène de Briqueville, suspected that seventeenth-century French two-manual harpsichords were typically disposed with the 4' stop on the upper keyboard and the two 8' stops on the lower. Because of its close similarity to the instrument by Claude Labrèche, Carpentras, 1699, the ex-de Briqueville harpsichord (now in the Württembergisches Landesmuseum, Stuttgart) is firmly attributable to this maker. Both Labrèche harpsichords were doubtless made with a dogleg 4' on the upper manual,[84] but it would be taking too much of a leap to assume that these provincial instruments conformed to the mainstream Parisian or Lyonnaise practice of the period, or even of half a century previous.[85] Labrèche's upper-manual 4' could well have been as anomalous as his use of dogleg jacks and box slides rather than the shove coupler and separate thin leather-covered upper and lower guides made elsewhere in France. With the 4' on the upper manual one cannot easily play *pièces croisées*, and one cannot do this at all on instruments with doglegs rather than couplers. Except for the instruments of Labrèche, the several seventeenth-century French harpsichords which have survived with unquestioned original jacks and keyboards were

[83] See the description of this instrument in Koster, "The Harpsichord in Seventeenth-Century France."

[84] See Michel Foussard, "Le Clavecin de Claude Labrèche, Carpentras, 1699," *Musique-Images-Instruments* 7 (2005): 18–31; and Christopher Nobbs, "A French Harpsichord from the End of the Seventeenth-Century, Attributed to Claude Labrèche," *Musique-Images-Instruments* 7 (2005): 32–44.

[85] A contrary view is presented in Peter Mole, "Seventeenth-Century Harpsichords: Playing the Four-Foot Stop," in *Interpreting Historical Keyboard Music: Sources, Contexts and Performance*, ed. Andrew Woolley and John Kitchen (London: Ashgate, 2013), 131–39.

disposed with shove couplers and the 4' on the lower manual.[86] Thus, they had the same standard disposition as eighteenth-century French doubles, except that buff stops were more often present in the latter. In view of uniformity of the design and compass of the keyboards and other elements of the actions of the seventeenth-century harpsichords, it seems unlikely that the dispositions would often have varied from this standard.

That, with very few exceptions, seventeenth- and eighteenth-century French harpsichords were doubles suggests that the two keyboards were used much more frequently than just for playing the occasional *pièce croisée*. A major use was in accompaniment of other instruments and singers. Saint Lambert, in his *Nouveau traité de l'accompagnement du clavecin* (Paris, 1707), stated (p. 61) that a singer performing with a very weak "half voice" should be accompanied on the *petit jeu* (i.e., the upper manual), while all the stops should be used for a singer with a strong chest voice. Presumably to accompany singers or other performers who modulated their tone expressively with different degrees of loud and soft within a movement, the harpsichordist would change manuals appropriately.

As for the solo repertoire for harpsichord, François Couperin's instructions for playing *pièces croisées*, as in the heading of *Les Bagatelles* in his *Second Livre de pièces de Clavecin* (Paris, 1716/1717), specify that one should uncouple the keyboards and retire the 4', and Jean-François Dandrieu's directions for playing *Le Concert des Oiseaux* state that one should disengage the two 8' registers, leaving just the 4'. Such instructions have been taken as indications that the default registration in this period was with all three registers, one or more of which would be turned off for special effects.[87] Because, however, the pieces with such instructions were generally preceded by pieces that would naturally be played with a full registration (for example, *L'Amazone*, marked *Vivement et fierement*, before *Les Bagatelles*; and *Les Tourbillons*, marked *Vivement*, before *Le Concert des Oiseaux*), one could regard the directions to remove stops as reflecting only the particular circumstances of proceeding from one movement of a suite to the next. In any case, if the typical harpsichord were used as much for accompaniment as for solo playing, the default registration for the former, but not necessarily for the latter, might well have been with all three stops (i.e., the registration that Saint Lambert specified as appropriate for singers with strong

[86] An example is the anonymous harpsichord of 1667 in the Museum of Fine Arts, Boston, discussed in Koster, *Keyboard Musical Instruments*, 40–44.

[87] See Gilbert, "Le Clavecin Français et la registration," 207; and Fuller, "Registration, §II: Harpsichord," in *Grove Dictionary of Musical Instruments*, 4:289.

voices). For what it's worth, an English source of the period with instructions for playing a three-stop instrument mentioned that "three Setts of Strings … all together are only a thoroughbass to a Consort: for Lessons [i.e., solo pieces] any two sets of the three are more proper."[88]

That most *pièces croisées*, which were played on single 8' registers, are high in tessitura might suggest that many other pieces, or sections of pieces, written entirely or substantially for the upper range of the keyboard, were likewise intended to exploit the delicious treble sounds of one or the other 8' stop on a fine French harpsichord or *ravalé* Ruckers. Among the numerous such pieces in the works of François Couperin that might most effectively be played on a single 8' stop are *La Muse Naissante* (*Septième Ordre*), *Les Lis naissans*, *Les Fauvétes Plaintives*, *Le Carrillon de Cithére* (*Treizième Ordre*), and *Les Vieux Signeurs* (*Vingt-Quatrième Ordre*); and among other composers, a *Menuet* by Jean-Philippe Rameau (*Nouvelles Suites de Pièces de Clavecin*, 1727/28), Dandrieu's *La Touchante* (*Troisième Livre*, 1734), and Louis-Claude Daquin's *Les Bergères* and *La Tendre Silvie* (*Premier Livre de Pièces de Clavecin*, 1735). Earlier composers tended not to write entire pieces in the high tessitura, but in certain works there are key passages in the upper range that might be taken to characterize the registration of the movement as a whole, for example, the beginning and measures 24–26 and 33–35 of D'Anglebert's *Chaconne de Galatée* (*Pièces de Clavecin*, 1689), the beginning of Louis(?) Couperin's *La Pastourelle*, and the beginning of the third section of his *Tombeau de M^r^ Blancrocher*.[89] This should not be taken to suggest that single-8' registration is suitable for all high-tessitura works (surely not *L'Amazone* in Dandrieu's *Troisième Livre*) or is suitable only for them. Many pieces with a balance of bass and treble (e.g., François Couperin's *Le Rossignol-En-Amour* in the *Quatorizième Ordre*; also many allemandes) or, indeed, entirely in the bass range (e.g., Couperin's *Les Délices* in the *Septième Ordre*) can be played effectively on one 8' stop alone.

Whether the individual sections of pieces in binary form were routinely played first on the lower manual followed by the repetition on the upper, or *vice versa*, is questionable. It is possible, however, that the *petites reprises* at the ends of some movements were routinely played as echoes on the upper manual. Although

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[88] Hubbard, *Three Centuries*, 153.

[89] These are nos. 52 and 84 in Alan Curtis's edition of Louis Couperin, *Pièces de Clavecin* (Paris: Heugel & Cie, 1971). One should note that the sources of all works attributed to Louis Couperin lack the composer's forename. As Glen Wilson argues in an article forthcoming in *Early Keyboard Journal* (vol. 30), they might well have been composed by Louis's brother Charles (father of François Couperin).

there is very little direct evidence for this presumed custom in French sources,[90] the *piano* markings added to the *petites reprises* in Froberger's sarabandes in the French style contained in pirated collections of his suites published in Amsterdam several decades after his death might possibly reflect a longstanding performance tradition.[91] Except, however, for several *petites reprises* marked *Doux* (or *D*) in Pierre-Claude Foucquet's suite *Les Caractères de la Paix, Pièces de Clavecin, oeuvre premier* (1751),[92] French composers seem never to have indicated in any way that these repetitions should be played *piano*. It is particularly telling that in several collections with careful indications of manual changes for echoes and other effects—Dandrieu's *Premier Livre* (1724), Rameau's *Nouvelles Suites* (1727/28), François Dagincour's *Pièces de Clavecin* (1733), Joseph Bodin de Boismortier's *Quatre Suites de Pièces de Clavecin* (1736), Jean-Baptiste-Antoine Forqueray's arrangements of his father's pieces for viol (*Pièces de Viole … Mises en Pièces de Clavecin*, 1747), and Claude-Bénigne Balbastre's *Pièces de Clavecin* (1759)—there are no such indications for *petites reprises*.[93] One might well conclude that *petites reprises* were normally played without shifting to the upper manual.

A frustratingly large proportion of the works with indications of manual changes are atypical programmatic pieces such as Dandrieu's *Les Caractères de la Guerre*, Rameau's *La Poule*, Foucquet's *Les Caractères de la Paix*, and Armand-Louis Couperin's *L'Allemande* (not an allemande!) of *Les Quatre Nations* (*Pièces de Clavecin*, 1751). The relatively few conventional pieces do, however, provide

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[90] Troeger (*Technique and Interpretation*, 199) is entirely mistaken in stating that "A significant proportion of eighteenth-century French pieces have *petites reprises* marked *p*." I am most grateful to Glen Wilson (who offered very helpful comments on a draft of this article) for a wide-ranging search through this repertoire, including the works of Claude Balbastre, Jean Barrière, Joseph Bodin de Boismortier, Louis-Nicolas Clérambault, Michel Corrette, François Couperin, François Dagincour, Jean-François Dandrieu, Louis-Claude Daquin, Bernard de Bury, Charles Demars, Louis-Antoine Dornel, Jacques Duphly, Durocher, Jean-Baptiste-Antoine Forqueray, Pierre-Jean Lambert, Gaspard Le Roux, Louis Marchand, Christophe Moyreau, Jean-Philippe Rameau, Pancrace Royer, Nicolas Siret, and Philippe-François Veras, none of whom indicated a change of manual or of loudness for *petites reprises*. I have noticed no such indications in the seventeenth-century French repertoire.

[91] These are in suites 10 and 18 in the edition edited by Guido Adler: Johann Jakob Froberger, *Klavierwerke II*, Denkmäler der Tonkunst in Österreich, Jahrgang VI/2, Band 13 (Vienna: Artaria, 1899).

[92] Pages 9 and 10, abbreviated *D* in the latter instance. Also marked *Doux* in the position of *petites reprises* are an echo on p. 8 and a tag phrase on p. 13.

[93] In Balbastre's *La Courteille*, the passage marked *petite Reprise* and *Gracieux*, which would be regarded as *piano* in contrast to passages marked *fort*, is not a *petite reprise* in the conventional sense.

some hints about the use of the two manuals. In Dagincour's *La Moderne*, Boismortier's *La Caverneuse* and *La Rustique*, Forqueray's *La Portugaise*, and Armand-Louis Couperin's *La Blanchet* and *La Foucquet*, and Balbastre's *Gavotte* (the first part of *La Berville*), the upper manual is indicated for brief echoes or echo-like effects. By analogy one might, for example, shift to the upper manual for the echoes in François Couperin's *Air dans le Goût Polonais* (*Vingtième Ordre*), in the second part of his *La Muse Naissante* (*Septième Ordre*; from the middle of the sixth measure to the middle of the seventh), and in the third *couplet* of *La Favorite* (*Troisième Ordre*; from the end of measure 4 to the middle of measure 8). In *Le Gazoüillement* (*Sixième Ordre*), which, completely in the upper part of the compass, could well be played on a single 8' stop, the performer could play on the lower manual to measure 28, shift to the upper manual at the direction *Plaintivement*, and then back to the lower for the echo and on to the end.

Another use of the upper manual was to differentiate passages of a contrasting nature, for example, the four measures beginning with the indication *p[etit] Clavier* in measure 52 of Forqueray's *La Sainscy*. Similarly contrasting passages in Balbastre's *La De Caze, La Courteille, La Lamarck, 2me Gavotte* (the second part of *La Berville*), and *La Laporte* are marked *moéleux*, *Gracieux*, or *Doux*, and were clearly meant to be played on the upper manual, with *fort* indicating returns to the lower. This interpretation is obvious, even if the most explicit terms, *petit Clavier* and *grand* [*Clavier*], are found only in the first *Gavotte* of *La Berville*. Armand-Louis Couperin also used different terms in different pieces: *Doux* and *fort* in *L'Arlequine ou L'Adam* (and for the echoes in *La Foucquet*) but *Tendre* and *Fierement* in *La De Croissy*. In the works of the older generation of composers one might well consider shifting to the upper manual for analogous contrasting passages, especially those marked with expressive terms; for example, in François Couperin's *L'Amphibie* (*Vingt-Quatrième Ordre*) the sections marked *coulé*, *Modérément,* and *Afectueusement* surrounded by sections marked *Noblement*, *Gayment*, *Vivement*, and *Marqué*. In Rameau's *L'Enharmonique* (*Nouvelles Suites*) one might alternate between the upper and lower manuals as suggested by the alternating designations *Gratieusement* and *hardim[en]t*. The passage from *Le Gazoüillement* mentioned above could also be taken as an example of a manual change to be made in conjunction with an expressive indication. Needless to say, expressive designations should not always be taken to indicate changes of manual. In Couperin's *Sarabande L'Unique* (*Huitième Ordre*), for example, doubtless intended for a full registration on the lower manual, one surely would not shift from manual to manual at the alternating indications of *Gravement* and *Vivement*. Conversely, however, appropriate contrasting passages without

expressive designations might well be played with manual changes; for example, the first five measures of the B-section of Couperin's *La Ténébreuse* (*Troisième Ordre*), which, played on the upper manual, would provide a moment of light before returning to the dark on the lower manual in measure sixteen.

Forqueray designated that several of the couplets in *La Morangis ou La Plissay, Mouvement du Chaconne*, should be played on the *petit clavier*. This might provide some justification for occasionally doing the same in the passacaglias and chaconnes of earlier composers.[94] Readily coming to mind is François Couperin's great *Passacaille* (*Huitième Ordre*), in which one could effectively shift to the upper manual for the third and fourth *couplets*, which, being in the upper part of the compass, are of a contrasting nature. In Jean-Henri D'Anglebert's *Passacaille d'Armide* (*Pièces de Clavecin*, 1689) the passages in the high range, reflecting those played by flutes alone in the original orchestral version of Jean-Baptiste Lully's opera *Armide*, could also well be played on the upper manual. In Louis(?) Couperin's G-minor *Passacaille*[95] the change in mode, from minor to major, might be accompanied by a change of manuals, as at the major-to-minor shift in Forqueray's *La Morangis* and, conceivably, as mentioned above, in François Couperin's *L'Amphibie* (*Mouvement de Passacaille*).[96]

There is no particular evidence that keyboard shifts or other registrational changes were made in sets of variations, such as Gaspard Le Roux's *Sarabande* with eleven variations in his *Pièces de Clavessin* (1705) and Rameau's *Gavotte* with its six *doubles* (*Nouvelles Suites*). It seems highly likely, however, that if changes of manual were regularly done in chaconnes and passacaglias—both names used for works in variation or rondo form—manual changes would also have been done in other types of variations and *rondeaux*. Indeed, in all these forms other registrational changes—engaging or disengaging the 4', the coupler, or the buff stop—might, with opportune pauses, also have been made between distinct sections in sets of variations or occasionally between the *couplets* of works in rondo form.

Except for *pièces croisées*, there is little or no evidence for the simultaneous use of two keyboards in the French repertoire. This is curious in that all the major

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[94] I am inclined, however, to regard the short double bars found between some couplets in two of the chaconnes in Nicolas Lebègue's *Second Livre de Clavessin* (1687) as articulation marks, not indications of manual changes, as proposed by David Fuller in "Harpsichord Registration," 6; and "Registration §II: Harpsichord," in *Grove Dictionary of Musical Instruments*, 290.

[95] Louis Couperin, *Pièces de Clavecin*, ed. Alan Curtis, no. 98.

[96] Alternatively, the shift to the upper manual in the senior Couperin's *Passacaille* could be reserved for the high-tessitura passage within the major section.

clavecinistes were also notable organists who in their organ works frequently specified two manuals for such common textures as *duos* and *recits*. While J. S. Bach's Goldberg Variations, for example, include simultaneous two-manual movements analogous to those in French organ music (var. 7 is a *duo*; var. 13 a *recit*), the French seem almost deliberately to have avoided specifying two manuals for such writing in their harpsichord works. François Couperin, in fact, devised a sign, a short vertical line between the staves, to indicate a unison between the two hands, thus alerting the performer to play the note with only one finger. This is found, for example, in *Les Plaisirs de Saint-Germain en Laÿe* (*Premier Ordre*), which is essentially a *duo*.[97] The unison sign would be unnecessary if the voices were played on separate keyboards.

It is difficult to find in the French harpsichord literature any clear examples of accompanied-solo textures like that of French organ *recits* or the 13th Goldberg variation. Perhaps the several relatively slight *Airs de Ballet* arranged by D'Anglebert after orchestral works of Jean-Baptiste Lully would qualify, as might some simple dance movements, such as the passepieds by Gaspard Le Roux as well as some sections of his sarabande with variations.[98] François Couperin's *Les Regrets* (*Troisième Ordre*) could also have been played in this manner—that is, with the right hand playing the mostly one-voice solo *forte* on the lower manual, and the left hand playing the mostly two-voice accompaniment *piano* on the upper—but an unpretentious single-manual performance is at least as effective, indeed more so. The subtitle of Elisabeth Jacquet de la Guerre's *Pièces de Clavecin* (Paris, 1707), *Qui peuvent se Joüer sur le Viollon*, inviting violinists to play the upper line of the keyboard score, might have prompted lone harpsichordists to play the melody as an accompanied solo. Some rearrangement, however, would have been necessary to avoid having always to play the frequent secondary voices with the melodic hand.[99] But Jacquet's pieces would be exceptional in this regard. Perhaps most indicative of conventional practice is Michel Corrette's *Nouveau Livre de Noëls avec un Carillon Pour le Clavecin ou L'Orgue* (about 1740). This

[97] On this point see Thurston Dart, "On Couperin's Harpsichord Music," *The Musical Times* 110, no. 1516, 125th Anniversary Issue (June 1969): 590–94, esp. 591; also Gilbert, "Le Clavecin Français et la registration," 208. That the unison symbol is lacking in *Les Nonètes* (also in the *Premier Ordre*) is presumably the result of an oversight.

[98] In some of these variations the bass could be played on the lower manual accompanied on the upper, rather in the manner of a *Basse de Trompette* for organ.

[99] The absence of double stops in the composer's violin sonatas, published together with the harpsichord pieces, suggests that the secondary voices on the right-hand staff of the latter would not have been played on the violin.

includes organ registrations with many instances of the simultaneous use of two manuals for *Duos*, *Recits*, and bass solos, but Corrette specified in his introduction that when playing the pieces on a harpsichord one should (with the exception of two *Recits de Trompette*) generally use just a single manual.

b. Variant Traditions

If we assume, plausibly, that there was no existing tradition of making contrasting doubles prior to their invention in France around 1640, the idea soon spread elsewhere. This does not mean that French harpsichords or their registrational resources were imitated closely. Rather, the germ of the idea of aligned keyboards was combined with existing regional traditions. The earliest known non-French harpsichord constructed as a contrasting double was made in 1658 almost certainly in the northern Netherlands (i.e., "Holland").[100] Strung in the traditional Netherlandish ("Flemish") manner with a single 8' and a 4', the instrument's lower manual had three registers, two plucking the 8' strings at different points, the other the 4'. The upper manual had only a nasal register plucking the 8' strings. Significantly, there was no coupler of any kind. Thus, this was a non-simultaneous contrasting double. The sole possible simultaneous registration of upper-manual nasal 8' and lower-manual 4' might occasionally have been used, but the primary reason for isolating the nasal stop on the upper manual was doubtless to avoid the weight of four jacks on a single-manual keyboard and to provide optimal keyboard balance points for both the nasal register and the registers in the main gap. The nasal register, presumably introduced to the Netherlands through one of the German organbuilders active there, was, so to speak, grafted onto a single-manual model of the type with a second 8' register plucking the same strings as the first, as in the Couchet harpsichord of 1679 mentioned above.

In 1662 the prominent Westphalian organ builder Hans Henrich Bader completed a large organ for Kloster Abdinghof in Paderborn (Westphalia). At the same time, he made a harpsichord, which the monastery's abbot described as:

> …a beautiful keyboard instrument or large harpsichord [*ster stück*]. Which instrument, first of all, sounds at twelve-foot pitch and consists, then, of four different stops, namely: first, a twelve-foot *archispinetto*; second, a double unison, each at twelve-foot pitch; third, an octave. And these stops can be interchanged in a special way or be used and played simultaneously on two keyboards. Therefore, indeed, such a model, resonance, and sweet harmony have, as it were, never been seen or

[100] See Koster, "A Netherlandish Harpsichord of 1658 Reexamined."

heard before, as all enthusiasts and all gentlemen and masters experienced in this art must be completely delighted to report.[101]

This is the earliest known account of a contrasting double in Germany. That the stops were described as 12' should be taken only to indicate that they were 8' stops on a keyboard descending to FF. The *archispinetto* was likely a nasal register on the upper manual. Whether there was a coupler of some sort, whether one of the two 8' stops comprising the double unison was on the upper keyboard or the lower, and whether each of the three 8' registers had its own set of strings cannot be determined. There must, however, have been at least two sets of 8' strings which could be played separately but simultaneously on the upper and lower manuals. Basically, the disposition was as if that of the earlier seventeenth-century German clavicytherium mentioned above were spread over two keyboards.

The idea of the nasal register had reached Antwerp by the late eighteenth century, as shown by the Britsen harpsichord of 1681, and persisted there in J. D. Dulcken's doubles of the mid-eighteenth century. At some point, perhaps around 1700, a second keyboard was added to the Britsen harpsichord, such that its new lower manual played the normal 8' and 4' stops and the upper played the nasal 8'. Since both 8' stops had their own strings, the instrument became a contrasting double, but, significantly, there was no coupler. As on the anonymous Dutch instrument of 1658, the nasal register could only be played solo, not combined in ensemble with the others.

Very little is known of harpsichord making in the Low Countries when contrasting doubles would have begun to be made, between the early 1680s and the 1740s. Possibly most of the contrasting doubles in this period came about by alteration of earlier Antwerp harpsichords, as van Blankenburg did to his Ruckers double in 1708. A surviving instrument altered in this period is a double by Joannes Ruckers, 1642, on which the *1701* discreetly written on the soundboard records the date of the modifications.[102] These were almost certainly done in Holland, where the instrument remained until the nineteenth century.

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[101] The original document is transcribed in Hugo Wohnfurter, *Die Orgelbauerfamilie Bader 1600–1742* (Kassel: Bärenreiter, 1981), 193: "…Meister Hanß Henrich Bader… ein schönes Instrument oder großes ster stück verfertiget, welches Instrument vors erst auff zwolff fueß, sprechen vndt demnegst betstehen thuet in vier vnterschiedtlichen stimmen, alß nemblich sindt pro p^{mo} ein archispinetto von 12. fueß, 2do ein zweyen vnisonis, jede von 12 fueß, vndt dan 3^{tio} ein Octauigen, vndt können dieße Stimmen auff eine besondere Weiße abgewechselt, oder zugleich auff zwo Clauyr, gebraucht vndt gespielet werden also zwar, das dergleichen modell, resonantz vnd liebliche Harmoney /: Wie alle liebhabere vndt in solcher kunst wollerfaherene herren vndt Meistere solches ganz gerne nachgeben müeßen :/ es sey auch wo es wolle, niemals gesehen noch gehort worden."

[102] Private collection, New York. I am grateful to Walter Burr for pointing out this date.

The new disposition was 8' and 4' on the lower manual, a dogleg 8' with its own set of strings, and a 4' on the upper playing the same strings as the lower 4'.

The use of doglegs instead of the shove couplers found in French harpsichords persisted in eighteenth-century Dutch and Flemish harpsichord making. Dulcken's usual two-manual disposition was 8' and 4' on the lower manual; played by both manuals, a dogleg 8' with its own set of strings; and an upper-manual nasal 8' playing the same strings as the lower-manual 8'.[103] This troubled Frank Hubbard, who lamented that one could not employ a separate solo 8' stop on each manual simultaneously; that is, one could not play *pièces croisées* nor could one rapidly alternate between solo 8' stops.[104] The same is true of eighteenth-century English doubles, unless one were willing to play the upper-manual nasal against the lower manual 8'. Obviously, the expectations of what one should be able to do on a two-manual harpsichord were different in the Low Countries and England than in France. It is pointless to blame the Flemish or English for not wishing to play in the manner of classic French *pièces croisées*, which, after all, were a very small part of the French repertoire. Further, it is not certain that the French themselves would often have alternated between solo 8' stops by, say, playing repeats on the upper manual. In any case, dogleg jacks provide the advantage of avoiding the inertia of moving coupled upper-manual keys, a particular advantage when these carry the additional weight of a second set of jacks (i.e, those of the nasal register common in the English and Flemish doubles).[105]

One configuration found relatively often in eighteenth-century harpsichord music from regions other than France is the accompanied solo. Prime examples are the second movement of J. S. Bach's Italian Concerto and the 13th and 25th of the Goldberg Variations. Others, albeit without careful indications that two keyboards should be used, are several movements in the Dutch organist Pieter Bustijn's *IX Suittes pour le Clavessin*, published in Amsterdam about 1712; the opening *Adagio* of G. F. Handel's F-major Suite (*Suites de Pièces Pour le Clavecin*,

[103] See Tournay, *Archives Dulcken*, 1:20–24; and Hubbard, *Three Centuries*, 80.

[104] Hubbard, *Three Centuries*, 80–81, where, perhaps even misunderstanding the use of his norm, French doubles, he further opined that "One is forced to the conclusion that Dulcken did not think in terms of true two-manual performance in which the various stops are used consistently to give a distinct personality to each voice."

[105] Tellingly, the description of a harpsichord by Zacharias Hildebrandt offered for sale in Leipzig in 1779 notes that "its touch is very light, since, after an improvement, the upper manual can be played together [with the lower] without a coupler." Presumably, the shove coupler was removed and dogleg jacks installed. See Heyde, "Der Instrumentenbau in Leipzig," 76: "… dessen Tractament sehr leichte ist, weil, nach einer Verbesserung, das obere Clavier ohne Kuppel mit spielen kann."

London, 1720); several of Joseph-Hector Fiocco's *Pièces de Clavecin* (Brussels, 1730), e.g., the *Adagio* and *Andante* of the first suite; and the sarabandes of Bach's second and fifth French suites. Perhaps the most likely registration to have been used for two-manual performances of the Handel and Fiocco pieces on contemporary Flemish or English harpsichords would have been for the left hand to play the accompaniment on the upper-manual dogleg 8' and the right hand to play the melody, sounding *forte* on the lower-manual 8' stop plus the dogleg. Other conceivable combinations with single 8' accompaniment and the melody played on a combination of two stops would be dogleg 8' on the upper with dogleg and 4' on the lower; nasal 8' on the upper with 8' and 4' on the lower (possible on English harpsichords or the rebuilt Britsen); and (with the Dulcken disposition) nasal 8' plus dogleg 8' sounding the melody on the upper manual, accompanied by the dogleg on the lower. Needless to say, similar effects, except those involving the nasal, would have been available in France on harpsichords with shove couplers, even if two-manual performance of accompanied solos seems not to have been cultivated there. In general, as admirably demonstrated by such works as Scarlatti's E-major sonata, K. 208, presumably conceived for a single-manual harpsichord, and the *Aria* of Bach's Goldberg Variations, which must be played on one keyboard (unless, like Landowska, one contorts the right hand to play the melody on the upper manual while playing some of the accompaniment on the lower), single-manual performance of works that might be considered accompanied solos can be completely satisfying musically.

It is sometimes thought that, as one internet wag put it, "[François] Couperin's harpsichord music is a snugger fit on the harpsichord than Bach's general purpose stuff"[106]—or, as an American keyboardist wrote somewhat more formally:

> Who, in fact, was the great harpsichord composer of the time? – it was Couperin. He was to the harpsichord what Chopin was to the piano. He developed its possibilities to the utmost: the very structure, figure and ornament of his works are so intrinsically developed from harpsichord technique and its possibilities of sonority that I would be the first to say "this is harpsichord music, and is best on the harpsichord."[107]

Leaving aside the question of whether the structure, figure, and ornament of Bach's

[106] See the Talk Classical web forum, http://www.talkclassical.com/33325-fran-ois-couperin-johann.html#post695233 (accessed November 24, 2015).

[107] Rosalyn Tureck, "Bach: Piano, Harpsichord, or Clavichord," *American Music Teacher* 11, no. 3 (January 1962): 8–9 and 30. Text available on the website of the Tureck Bach Research Institute, Inc., at http://www.tureckbach.com/publication-documentation/page/piano-harpsichord-or-clavichord (accessed November 23, 2015).

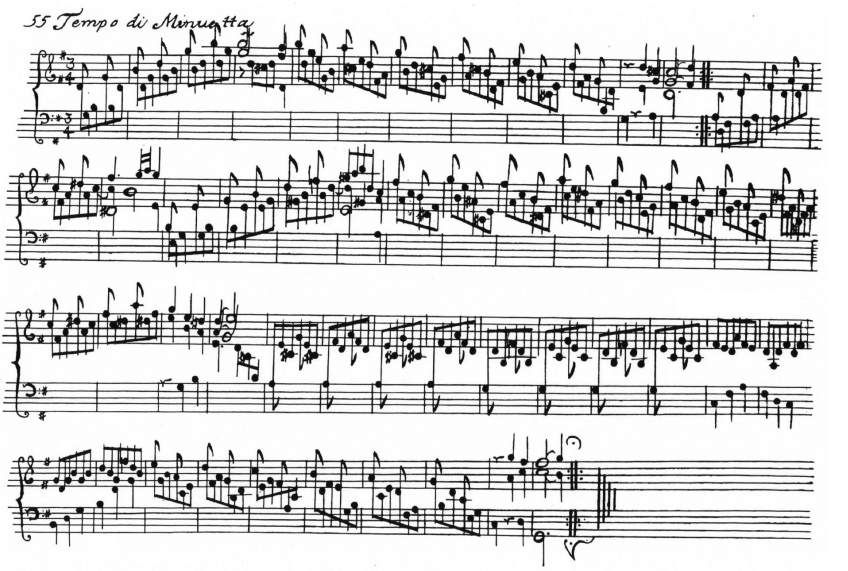

Figure 2 *J. S. Bach,* Tempo di Minuetta *from Partita 5,* Clavierübung I *(Leipzig, 1731).*

compositions for stringed keyboards really were less idiomatically conceived for the harpsichord than Couperin's, one must note that Bach went much farther than Couperin or any other Frenchman in composing for the harpsichord as a two-manual instrument. In addition to noting the many two-manual configurations to be found in *Clavierübung II* and *IV*, one might well close by mentioning an extraordinary use of two keyboards, largely overlooked, in *Clavierübung I*. The *Tempo di Minuetta* of the fifth Partita, with time signature 3/4, moves primarily in eighth notes with downward stems, but with the first and fourth of the six notes in most measures having an additional upward stem (see Figure 2). For eight measures in the B-section the pattern is reversed. The double-stemmed notation would suggest that the movement should be played on two manuals each with a single 8', mostly by the left hand but with the right also playing the first and fourth notes (or reversed for the passage in the B-section) so that they sound on both manuals.[108] Thus, these louder beats provide a rhythmic counterpoint in 6/8 time. One could, perhaps, simulate the effect to some degree on a clavichord

[108] Superfically similar but, in fact, quite different are passages in French works, such as Rameau's *Allemande* and the fourth *double* of his *Gavotte* (*Nouvelles Suites*), in which notes alternately with upward and downward stems were likely played alternately by the right and left hands on the same keyboard.

or piano, but this little piece, with subtle registration essential for its full effect, is *harpsichord* music of the highest order.

* * *

Few if any present-day performers have access to all the different harpsichords historically appropriate for all the different repertoires. It would, however, be silly for performers to be bound to play only the repertoire exactly appropriate for the one or two instruments that they happen to own. Moreover, even the strictest historical approach permits some license. Frescobaldi's works, for example, were well known in France and Germany, where they surely were played on locally made instruments. Similarly, the works of French composers were widely known in England, the Low Countries, and Germany. Sweelinck's works were brought home by his many German pupils, a number of whom lived into the second half of the seventeenth century, when they might well have played their master's compositions on instruments with two 8' stops or two manuals. Thus, there is some historical justification for playing Sweelinck's works on a Ruckers harpsichord (or copy thereof) that had undergone alignment of the keyboards and the addition of a second set of 8' strings. Since the tonal structure and voicing of such a harpsichord in its altered state has become such that the second 8' is an integral part of the plenum, it would be infelicitous to confine one's fullest registration to just a single 8' and 4' in a vain attempt to render Sweelinck "authentically."

Compromises, then, are possible and not entirely to be condemned. If one wishes to play a wide range of repertoire and can have only one instrument, no better choice can be made than a two-manual harpsichord with the French disposition. Playing works historically associated with other schools and periods of harpsichord making on such an instrument can be regarded as the equivalent of D'Anglebert playing Frescobaldi. Still, license is best not stretched to licentiousness. Certainly by present-day standards few would wish to emulate Landowska's performances of seventeenth-century French pieces on her harsh but turgid 16' Pleyel. Today one might wish, for example, to draw the line at performing sixteenth- or early-seventeenth-century works with two-manual interplay or employing much change of registration for Frescobaldi. In general, the 2×8' combination might well be used less frequently and the 4' more than in many modern performances.

Discussing Bach's likely use of harpsichord, clavichord, or organ "according to the convenience and choice of the moment" for playing the preludes and fugues of the *Well-Tempered Clavier*, Ralph Kirkpatrick noted that "Their

musical values are such that, like sculpture under changing lighting conditions, their beauties are variously illuminated by the special qualities of any one of the three instruments to which Bach dedicated his clavier music."[109] Much the same could be said about the effect of different harpsichord stops and their various combinations. Registration is just one of many aspects of interpretation, but to register inappropriately is as if to turn a color gel or blazing searchlight on Bernini's *Ecstasy of St. Teresa*.

[109] Meredith Kirkpatrick, ed., *Ralph Kirkpatrick: Letters of the American Harpsichordist and Scholar* (Rochester, NY: University of Rochester Press, 2014), 85.