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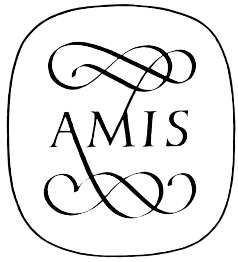

# BOOK REVIEWS

**Edward L. Kottick. *A History of the Harpsichord.* Bloomington, IN: Indiana University Press, 2003. 592 pp.: 229 black-and-white illus., 24 color illus., 4 musical exx. ISBN: 0-253-34166-3. $75.00 (hardcover).**

Edward L. Kottick is an educator, theoretician, musicologist, musician, harpsichord maker, technician, lecturer, tourist, and enthusiastic participant in the modern resurgence of the harpsichord. Putting all of these perspectives to work, he has written a worthy book on the object of his devotion, and devotion it is, for it can also be said of this author that he is truly a lover of harpsichords. In his new book, he occasionally lets fly a peal of adoration for what he calls "our glorious instrument" (p. 11) and the "Queen of Instruments" (p. 468). Kottick's *History* is an engaging overview of the six-hundred-year history of the harpsichord, including its fitful hibernation in the nineteenth century and its renaissance in the twentieth.

I confess to some apprehension about the book as I began reading, wondering if anyone could be up to what I first presumed to be an updating of Frank Hubbard's now forty-year-old but canonical *Three Centuries of Harpsichord Making* (Cambridge, MA: Harvard University Press, 1965). Could the new work possibly follow in the style and tradition, and match the scale, of that seminal work? It proved a mistake, however, to assume too much duplication of mission between the two books. Through his research on instruments and other primary documents, Hubbard single-handedly extended the whole perimeter of published scholarship on the harpsichord. That perimeter is so much larger today that no one person could extend it again in so many directions. Although Kottick has occasionally engaged in primary research, he writes more as a journalist reporting on the research of others, all of whom get credit for their contributions. On occasion, he reports on a controversy between scholars, stepping into the fray to shed some light of his own, as in the discussion about past alterations of bridge position on the Hans Müller harpsichord of 1537 (pp. 35–36). Technical and historical information from secondary sources is generally well documented in the endnotes, and most of the relevant literature is cited in some way. Kottick's book is thus useful as an index to the published scholarship that has appeared in profusion since Hubbard walked that

path nearly alone. As we shall see, the book also covers ground that was simply outside the scope of the 1965 publication.

The twenty chapters are grouped by century. This improves upon past emphasis on national schools, giving an opportunity to discuss border-crossing influences that had as much to do with international events and the spirit of the times as they did geographic region. Within these century groupings, the author is then free to focus on one or more maker, dynasty, instrument or instrument subtype, style, nation, region, or any other useful subgroup. The counterpoint of influences that drove the evolution of style and technology in harpsichords can thus be treated more fluidly. The acknowledgments page offers some disclaimers, and lists some of the very credible scholars on whose work Kottick relied, as well as the equally credible ones who read drafts of the book. A small glossary of just over two pages appears near the end of the book, and this is supplemented by well-labeled schematic drawings in the text (for example, p. 170) and inside the front cover. The book concludes with a valuable eighteen-page bibliography and an index.

The main text is easy to read, flowing logically and with continuity from point to point, and each chapter ends with a summary. Diversions into eighty-six side topics are set apart in sidebars scattered throughout the text; these range in length from an eighth of a page to two pages. This is a sensible method of presenting stand-alone mini-articles covering a vast range of subjects that cannot be handled as well, or as accessibly, in the main text. In several cases, sidebars are used to sort out the members of an instrument-making dynasty, including Ruckers (p. 106), Blanchet/Taskin (p. 272), and Gräbner (p. 334). Sidebars are also used to compare styles of harpsichord design, such as those of the seventeenth-century Flemish and Italian regions (p. 154). Technical matters, such as the physics and technology of wire and scaling (p. 16), are explained in easy-to-understand prose, either in sidebars or in the main text. I would have appreciated a list of these useful sidebars, perhaps between the table of contents and the list of illustrations.

Because there is so much organological ground to cover, Kottick does not venture very far into the instrument's social, economic, and artistic context. The text touches only lightly on music and composers. Although often made by the same people, organs receive little press beyond that fact, and clavichords also get only passing mention. Pianos get rather more space, and the *Geigenwerk* receives a sizeable sidebar and a photo.

Kottick has a gift for grouping instruments according to shared specifications and patterns of construction and decoration. He heads off assumptions that the lost majority of instruments would corroborate the group descriptions when the sample of instruments is small, as it is with the seventeenth-century English and German groups. Similarly, he warns about the "survival of the fanciest," the tendency of surviving instruments not to accurately represent what was most common. Such scholarly conservatism adds to the reader's confidence in his analysis.

Like furniture and works of decorative art, harpsichords made fifty to seventy-five years ago are at the bottom of their popularity, being neither sufficiently current nor antique. Kottick, however, describes the German factory instruments of that time with respect and neutrality, giving due credit to the makers for their considerable progress toward the goals they set for themselves.

Some of the most precarious work of the historian lies in identifying very early influences, especially as they morphed their way over regional boundaries. Kottick faced such a challenge with his discussion of the early pan-European or "International" style, a concept he credits at least partly to John Koster (p. 3). This style provided the antecedents for design characteristics once thought to have spread northward across Europe from Italy, but which may actually have come from central Europe. Despite going perhaps a bit too far in making the International style distinct and concrete, Kottick acknowledges the dangerously low number of examples on which to rely (p. 159), and quotes Koster's warning not to see it as "an immutable standard practice" but rather as "a group of somewhat variable local traditions that . . . drew upon the same gene pool originating from a Gothic lineage." (p. 52).

Kottick's *History* is generously illustrated with black-and-white photographs, period illustrations, and sixteen pages of color photographs grouped in the center. A few are of excellent quality, but the color in some of the plates is altered because of the age of the original image, and many of the black-and-white photographs are a bit dark and muddy. Some are obviously snapshots taken in collectors' houses and museum exhibits and storerooms, during the group tours led by Kottick and George Lucktenberg; the latter makes cameo appearances in two photographs (pp. 288 and 307), and in others the occasional hand, head, or foot of a group member can be seen. Two photographs (pp. 184 and 277) appear in their negative form, the latter amusingly depicting a "reverse keyboard" in reverse. Drawings are taken from many sources, each

in a different style and quality of draftsmanship, but none are more attractive than the ones produced by Kottick himself. Some of the drawings republished from other printed sources (for example, pp. 170 and 286) have distracting moiré patterns in shaded areas caused by overlapping printing screens from the two publications. Halftones scanned directly from earlier publications suffer similarly (for example, pp. 13, 48, and 78).

Disappointments with the text were few and rather trivial. Some have to do with terminology, where there is occasionally a risk that the book will tend to legitimize and popularize its own usage. I felt a moment of disorientation the first time I encountered the term "grand" to mean a wing-shaped harpsichord; I have not found a historical precedent for this leakage from piano vocabulary. Unlike pianos, members of the harpsichord family can go by their own names, so that "harpsichord" is understood as distinct from spinet, virginal, or clavicytherium. Surely there is a better technical phrase for the recessed and layered rose decoration than "upside-down wedding cake" (p. 183). Other shorthand jargon, involving the use of adjectives as nouns, strikes one as beneath the otherwise formal level of the book, as for example, "False inner outers began to supplant true inner outers . . ." (p. 155).

Proofreading oversights are relatively few, and most of the time the reader will know what was meant. It would be easy to miss, however, that "1700s" should read "1600s" on p. 353, line 12. I only caught this while lingering over the author's interesting suggestion that in Europe in the early eighteenth century there were enough old harpsichords that few new ones were needed. It seems more likely that the reason for the dearth of new instruments from this time lies outside our narrow field of view, in the social, economic, political, or cultural situation in Europe at the time.

Errors are naturally more obvious in a reviewer's area of primary expertise, and if that specialty happens to coincide with the author's blind spot, one should not assume that the whole text is equally accident-prone. Thus we come to the sections on England and America, and I begin with a patriotic correction. America declared its independence from England on July 4, 1776. The British disagreed strongly enough to enter into hostilities that lasted until 1783, when the Treaty of Paris brought the two sides together. Thus, from the American point of view, the colonies were not, as loyalist Kottick claims, "part of the British Empire until 1783" (p. 383). The reviewer's employment at Colonial

Williamsburg accounts also for his great interest in another claim from the same page, that the colorful James Juhan made musical instruments in Williamsburg, among eight other locations. Rumors of a connection between Juhan and Virginia's colonial capital have been around for some time, but I have not yet found any evidence of a residency here, and was disappointed that the author's source was not identified.

In merely repeating the conclusions of earlier writers, Kottick missed a chance to apply his instrument-maker's mind to the familiar cocking of 200- to 300-year-old English keyboards. The deformity does not result from failure of the cheek-bentside joint, nor does it usually involve the failure of joints in general, as he presumes (p. 368). Rather, it involves a much more complex system of distortions, especially in the pinblock and bentside. Whether it was considered much of a "curse" in the period must be a conjecture based on our experience with instruments that are now over two centuries old. The reviewer's reproduction of a Kirckman harpsichord adheres closely to Kirckman's framing scheme, yet shows an almost imperceptible cock after more than a decade of string tension. The assertion that instrument makers made no attempt to address case distortion is nevertheless not accurate. Framing designs were constantly tweaked by builders, especially in the early nineteenth century, as English grand pianos faced increasing compass and string tension.

According to Kottick, the vulnerability of walnut to woodworm caused a gradual switch to mahogany in England (p. 368). But both woods resist woodworm about equally well, leaving wood-boring beetles to prefer beech and conifer woods. The switch to mahogany was another instance of harpsichord makers trying with only modest success to keep pace with fashion trends in furniture and the decorative arts. The author does finally offer this dominant factor as a reason for the switch, but only as an alternative relegated to a note, citing Koster.

The idea that English keyboards were provided with lid hooks so "that the lid closed down tightly to protect . . . from the vicissitudes . . . of the English climate" seems a bit lame on several fronts, especially since the hooks do not seal the lid any better than gravity alone. That the buff stop was known in England as a "harp" stop (p. 370) is true, but the English also called it a buff stop: a Kershaw harpsichord (Manchester, England, 1769) in the Colonial Williamsburg collection has original stop labels formally inked on the foreboard, one marked "Buff." Pennsylvania German organ builder David Tannenberg is credited (p. 384) with making one of two surviving American harpsichords. This repeats an

erroneous entry in Donald H. Boalch, *Makers of the Harpsichord and Clavichord 1440–1840*, 3rd ed. ([Oxford: Clarendon Press, 1995], 650), as no such instrument exists by Tannenberg. Plywood is called a technological innovation of the late nineteenth century (p. 403), though it had long been used for various special purposes, such as for fretsawn galleries on furniture. In keyboard history, Johannes Zumpe was using laminated soundboards in pianos in 1766. The "Asten & Burton" cited on p. 356 as makers of a spinet of 1709 should be "Aston & Burton." Perhaps it is a technicality, but Longman & Broderip did not go bankrupt in 1798, as Kottick repeats from many other sources (p. 367). The firm actually entered bankruptcy court in 1795, and finally ended the business three years later.

In a work as broad and ambitious as Kottick's *History*, it is a compliment to him that a reviewer has to scrape so hard for quibbles. This is an excellent overview of harpsichord history, and is a much-needed summary of the body of scholarship that has materialized in the four decades since the last history of the instrument. It deserves to be on the shelf of everyone who holds any interest in the "Queen of Instruments."

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**Thomas Steiner, editor. *Instruments à claviers—expressivité et flexibilité sonore / Keyboard Instruments—Flexibility of Sound and Expression.* Actes des Rencontres Internationales *harmoniques* / Proceedings of the *harmoniques* International Congress, Lausanne 2002. Publikationen der Schweizerischen Musikforschenden Gesellschaft / Publications de la Société Suisse de Musicologie, Series II, vol. 44. Bern: Peter Lang, 2004. 320 pp.: 42 black-and-white photographs, 27 figures, 6 tables, 10 charts. ISBN: 3-03910-244-3. €38,69 (paper).**

The hottest topic in keyboard instrument studies nowadays is the eighteenth century. Although the title does not say so, this book focuses on that century, with two articles spilling over into the nineteenth. I have a small complaint about the English subtitle, which, I believe, misrepresents the French; I wish they had written "Keyboard Instruments—Sonorous Flexibility and Expressivity." Nevertheless, this is an enormously stimulating book, perhaps all the more so because it contains articles in four languages: English, French, German, and Italian. The fif-

teen essays cover a large area, from construction details of keyboard instruments through hammer leathers, strings, and keyboard styles, to types and combinations of instruments. The articles are written by leading scholars in their various fields.

The first group of articles, after Florence Gétreau's incisive summary, deals with types of instruments. Luigi-Ferdinando Tagliavini has lightly revised the article he wrote on his 1746 Ferrini piano-harpsichord (*Early Music* 19 [1991]: 398–408), making use of more recent publications. There are no real surprises in the revised article, though some details of construction are more clearly presented, and he makes comparisons with some Cristofori harpsichords. Kerstin Schwarz gives a brief but clear comparison among the pianos with Cristofori actions, from Cristofori's own instruments to the 1781 French instrument by Louis Bas in the National Music Museum in Vermillion, South Dakota. The article includes diagrams of actions and interior framing and photographs of her copies of the 1726 Cristofori. Schwarz does not state why she believes the hammers of the 1722 Cristofori are not original, a conclusion that can be disputed on several grounds.

Andrea Restelli compares Gottfried Silbermann's piano construction with harpsichord construction by one of his students, the Swedish maker Philip Jakob Specken. No harpsichords certainly attributable to Silbermann are known, but Restelli supposes that Silbermann's instruments were probably like Specken's. I confess a slight misgiving about this conclusion: Restelli's photographs of interior bracing in his copies of a Silbermann piano and of a Specken harpsichord show differences between the two in types of bracing.

Articles by William Jurgenson on the importance of the *Tangentenflügel* and by Michael Cole on the *pantalon* propose important corrections to standard accounts of eighteenth-century pianos. The history of the piano in the eighteenth century is much more complex than is usually acknowledged, and both articles point to instruments occupying lower social positions than those ordinarily emphasized. Jurgenson suggests—he is not the first to do so—that Mozart's 1777 letter to his father about Stein's pianos gives evidence that Mozart knew and liked tangent pianos. Michael Cole has been vocal in his insistence on the importance of *pantalons* in the whole picture, and rightly proposes that they descend from the Hebenstreit phenomenon. I wish only that Cole would not insist so fixedly that the *pantalon* was a different instrument from the pianoforte. The *pantalon* was a type of piano, differing from the

Cristofori-Silbermann tradition mostly, in my view, in the performance practice and aesthetic that it implied. The two lines came together as the tone-modifying stops characterizing the *pantalon* were taken over by the other tradition, and as the social lines became blurred at the turn of the nineteenth century. Indeed, Michael Latcham's article on combinations of harpsichord and piano during the eighteenth century emphasizes some of what I have in mind. He is thinking not only of piano-harpsichords like Tagliavini's Ferrini, but also of piano stops imitating plucking, harpsichord stops such as Venetian swells, and machine stops that allowed crescendo and diminuendo. A sentence in his conclusion is a telling summation: "We might then conclude that while the piano started off life as a hammered harpsichord, the harpsichord spent the last years of its life as a plucked piano" (p. 152).

Derek Adlam's essay on rhetoric in Haydn's keyboard music is disappointing in that, while it is full of rhetorical terms (*propositio*, *refutatio*, *conclusio*, etc.), he fails to show how the music fits them. One thinks by contrast of George Barth's careful work on rhetoric in Beethoven's music. And Jean-Jacques Eigeldinger's presentation on Chopin and the Pleyel piano is mostly a compendium of Chopin's remarks about Pleyels and evidence that he preferred them. I thought we knew that, but perhaps Eigeldinger's weight in Chopin studies now makes it inescapable.

The remaining articles deal with hammer leather and strings. Susanne Wittmayer's extensive account of the history and production of leather tells us probably everything we need to know on the subject. Christopher Clarke has studied hammers from the piano's beginning to 1870, from leather and various other materials to felt. His detailed "field report" on this crucial subject discusses workshop techniques and equipment and has a fine section on voicing. Two appendixes present original documents, from Gustav Schilling's *Encyclopädie der gesammten musikalischen Wissenschaften* (Stuttgart: F. H. Köhler, 1835) and from Giacomo Ferdinando Sievers's book on piano construction (*Il pianoforte: Guida per costruttori, accordatori, dilettanti e professori di pianoforti* [Naples: Stabilimento tipografico Ghio, 1868]).

Stephen Birkett and Paul Poletti discuss the reproduction of historical soft iron wire, showing modes of fabrication and production based on early documents, and they present a prospectus for a research project. Paul Poletti's "Beyond Pythagoras: Ancient Techniques for Designing Musical Instrument Scales" (i.e., keyboard instrument scales) speculates on how makers figured out their stringing designs. There is no real doc-

umentary evidence, but marks on soundboards show the design of bridges, which imply the scaling. Poletti is very inventive and can figure out ways of arriving at what he wants to do, and he demonstrates some techniques. But some of his terminology seems to me misleading. His first footnote (p. 273) says that " 'Pythagorean proportions' means a scale in which the octaves halve and double precisely in length, and the length of each successive note [meaning minor seconds] is related to the previous by the 12th root of 2. Such a scale is also called 'Just.' " I understand that instrument makers tend to use "Pythagorean" and "Just" as equivalent in stringing design, but I think this is somewhat sloppy terminology, as you cannot equate them in tuning. And Poletti confuses the difference between scaling and tuning with his "12th root of 2," a tuning concept having to do with the pitches of equal temperament. If he means that you distribute the difference in string lengths between the octave notes equally among the intervening strings, that would, I understand, correspond to normal practice. But that is not the 12th root of 2, which entails multiplication, not addition, and a gradation of vibration-rate differences. And Pythagoras never dealt with the chromatic scale. Much of what Poletti says later about arriving at scales seems to me excellent, quite apart from its putative relation to Pythagoras.

The book closes with Michael Latcham's summary of three round table discussions, one on obtaining appropriate leather, one on obtaining appropriate wire, and the third on instruments appropriate to Haydn's sonatas. The first two are very difficult problems, and the third has several probable answers.

We are closer to understanding eighteenth-century keyboard instruments with this book than we were before, but the picture is not yet definitive. But when can anyone claim a definitive answer to a general historical subject like that?

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**Trevor Pinch and Frank Trocco. *Analog Days: The Invention and Impact of the Moog Synthesizer*. Cambridge, MA: Harvard University Press, 2002. xv, 368 pp.: 56 black-and-white photographs, discography. ISBN: 0-674-00889-8. $29.95 (cloth).**

***Moog: A Documentary Film*. DVD. Written and directed by Hans Fjellestad, produced by Ryan Page and Hans Fjellestad. Brooklyn: Plexifilm,**

**2005. 70 minutes, with 47 minutes of bonus footage; Arturia™ Minimoog V software, fully functional demo (Mac, PC). $24.98.**

*Analog Days: The Invention and Impact of the Moog Synthesizer* covers the musical, social, technological, and economic issues surrounding the invention of the Moog synthesizer. It also includes information concerning the development of other early analog synthesizers such as the Buchla Box, ARP 2600, and VCS3. Pinch and Trocco effectively convey the atmosphere in which each synthesizer was developed and the goals and methods of the inventors, salespeople, and performers involved. Robert Moog's Trumansburg factory was a relaxed, "funky" environment in which engineers and inventors dressed casually and worked enthusiastically on their various projects, while Don Buchla's factory was intimidating because there were few lights and the workers were not allowed to talk. Alan Robert Pearlman's ARP factory was run like a business, with employees wearing suits and working hard to sell their products, while Peter Zinovieff's EMS (Electronic Music Studios) headquarters was a luxurious, comfortable place where rock stars and composers dined together—the synthesizers were manufactured elsewhere. Like the environments in which they were developed, each synthesizer was very different.

*Analog Days* stresses the importance of the interaction between humans and instruments. Moog's keyboard synthesizer was more successful than Buchla's keyboardless one because it was more appealing to musicians. The flaws in the construction of the Moog synthesizer and the imperfection of human performance are affectionately cited as defining characteristics of the analog era. Especially interesting (if sometimes slightly far-fetched, in my opinion) is the discussion of the relationship between women and synthesizers. Pinch and Trocco mention Suzanne Ciani's admission of romantic love for her Buchla 200 synthesizer, and they suggest that Walter (later Wendy) Carlos's involvement with the Moog synthesizer may have helped him escape from the reality of his gender. After the success of *Switched-On Bach* (Columbia Records, 1968), part of his identity was forever bound to a machine. Ciani feels that women approach technology in a more open-minded manner than men, because they are supposedly more patient with electronic devices and approach them with fewer preconceptions.

Pinch and Trocco are able to move among several musical genres effectively, a requirement for any adequate discussion of early synthesizers.

Rock musicians (Keith Emerson), soul artists (Stevie Wonder), composers for commercials and other electronic media (Suzanne Ciani), and early electronic experimenters (Wendy Carlos, Paul Beaver, Bernie Krause) are all presented as pivotal figures in the development of electronic music. The authors clearly understand popular music and experimental music. No single style of popular music or concert music is given preferential treatment, but commercially successful albums such as *Switched-On Bach* are discussed in detail because of their impact on popular culture.

An advanced understanding of the technical aspects of electronic music is not necessary for the majority of the book, but there are brief sections that will appeal only to specialists. The authors generally limit their use of advanced technical language to two major areas. The first concerns the major electronic innovations on the synthesizer that are linked to important musical changes in popular music; one such example is Keith Emerson's use of portamento effects in "Lucky Man." The second area concerns the technological differences between the major brands of synthesizers in the early 1970s. For instance, the oscillators on Perlman's ARP synthesizer were more stable than those on Moog's early synthesizers, and thus Perlman's instruments had fewer tuning problems. For the non-specialist, there is a glossary of important terms, such as oscillator, portamento, envelope, and filter.

Pinch and Trocco discuss many well-known musicians in the book, but they also pay attention to lesser-known figures in the history of the synthesizer. An entire chapter is devoted to the career of David Van Koevering, an important salesman of Minimoog synthesizers during the early 1970s. Also discussed are little-known inventors who worked for the major companies. Robert Moog invented the earliest models of the Moog synthesizer and provided the basic framework of the instrument, but the portable Minimoog was developed by Bell Hemsath. The authors explain the importance of Hemsath's invention and describe the willingness and determination of salesmen such as Koevering to promote it. This attention to behind-the-scenes figures is one of the book's strengths.

The transition from analog to digital synthesizers is discussed only briefly—the book is more a celebration of analog synthesizers than a discussion of a historical phenomenon that has been superseded. The perfection of digital technology and the use of sampling mark the beginning of a new era in electronic music, but the authors look back

affectionately on the analog era and they discuss the analog revival of the 1990s and beyond.

*Analog Days* is a worthwhile purchase for anyone interested in the Moog synthesizer or other early electronic instruments, and its thoroughness insures that most readers will learn a great deal from it. The book provides a good introduction to those just beginning to learn about analog synthesizers, and many photos are included. Those with a background in analog synthesizers will also undoubtedly learn a good deal, especially concerning the lesser-known pioneers. The Moog synthesizer was one of the most important inventions in twentieth-century music, and *Analog Days* is an important study.

Hans Fjellestad's documentary, *Moog*, is an excellent companion piece to *Analog Days*. Most of the film is built around interviews with Robert Moog. Artists such as Rick Wakeman and Bernie Worrell are also interviewed, and Keith Emerson, Stereolab, and others are seen in live performance. Emerson's performance on an early modular Moog synthesizer (as opposed to the much more popular Minimoog) is particularly interesting. Wendy Carlos, the composer of the pioneering album *Switched-On Bach*, was not involved with the film and no photos of her are shown. *Switched-On Bach* was the first album to bring the sound of the Moog synthesizer to large audiences, and her absence from the film is a noticeable weak point. In the liner notes Fjellestad claims that Carlos refused involvement.

Fjellestad clearly sought to show Moog as an unassuming genius. The most extensive interview was conducted at Moog's modest home in North Carolina, where he is seen on his front porch, in his kitchen, and in his garden; his humility is refreshing, and he comes across as a family man in love with nature, not as a man obsessed with machines or money. It becomes difficult for the viewer to fathom the controversy and suspicion that surrounded both him and the Moog synthesizer in the mid-1960s. Moog was clearly a hobbyist who managed to stumble upon a lucrative market.

Moog briefly explains the inner workings of one of his instruments, and there is a good deal of classic synthesizer footage throughout. Moog's expertise was in electronics, but he was incessantly concerned with the interaction between instruments and live performers. He consulted with many musicians concerning the sounds and effects on his synthesizers during the 1960s and '70s, and he often took their advice. Moog valued human interaction in the music-making process, and he

was intrigued by the fact that many musicians were able to use his instruments instinctively. He regretted that musicians were increasingly creating music in isolation, and he viewed group collaboration as essential to a socially healthy environment. His early detractors clearly misunderstood his personality and intentions.

Fjellestad effectively displays a good mix of classic footage and modern uses of the Moog synthesizer. A classic presentation by Gershon Kingsley's synthesizer quartet from the late 1960s is included alongside a modern performance by Money Mark (on Moog synthesizer and drum machine) and the DJ Mix Master Mike. Keith Emerson, who started using synthesizers in 1970, is shown playing a modular Moog synthesizer in a modern setting, to the approval of an appreciative audience. The Moog synthesizer is presented throughout as a contemporary instrument rather than an outdated one; many performers have rejected modern digital sounds in favor of the classic analog sounds, a trend remarked by Fjellestad as well as by Trocco and Pinch.

Moog built, played, and sold theremins before he invented his synthesizers. His interest in theremins never subsided, and he continued to build and sell them. *Moog* concludes with a performance of "Ol' Man River" by Moog on a theremin. Moog was excited to learn that four Japanese women were devoting themselves to the extensive study of the theremin. His enthusiasm is touching, and it is clear that he desperately yearned for electronic instruments to be taken seriously in the concert hall.

Robert Moog is the most important inventor in the history of analog synthesizers, and Fjellestad's entertaining and informative documentary is the most thorough portrait of him available. But the film's impact will probably be strongest on those with a general knowledge of the history of the Moog synthesizer. *Analog Days* is a better place for the uninitiated to start, as the lesser-known figures who make brief appearances in *Moog* (such as Herb Deutsch, Gershon Kingsley, and Walter Sear) are discussed in detail in Pinch and Trocco's book.

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**Bettina Wackernagel. *Musikinstrumentenverzeichnis der Bayerischen Hofkapelle von 1655: Faksimile, Transkription und Kommentar*. Veröffentlichungen der Gesellschaft für Bayerische Musikgeschichte. Tutzing: Hans**

**Schneider, 2003. 185 pp.: 5 color illus., 45 black-and-white illus., 5 color illus. ISBN: 3-7952-1137-9. €48,00 (cloth).**

A sample of the rich instrumentarium of the Bavarian Court Chapel in the late sixteenth century is depicted in a well-known painting by Hans Mielich, showing the ensemble under the direction of Orlande de Lassus (reproduced in this book as plate 1). A document of the Wittelsbach court from 1556, during the reign of Lassus's employer, Duke Albrecht V, records the establishment of a chamber for storage of musical instruments, along with the appointment of an administrator charged with their care. Additional Munich records show that well into the eighteenth century Bavarian rulers were concerned to varying degrees with the acquisition and maintenance of instruments for the practical use of the court musicians. At some time in the seventeenth century, the instruments began to be kept in a building belonging to a complex of structures known as the Neuveste (New Fortress), constituting the north-eastern corner of the Munich Residenz, in which several rooms were reserved for musical purposes. Whatever instruments and other musical materials were in this location during the night of March 4 and 5, 1750, were completely destroyed in an extensive fire that reduced the entire Neuveste and its contents to rubble.

This devastation would be no more than a sad footnote in the history of music at the Bavarian court, were it not for the existence of an inventory of its musical instruments set down in 1655 and preserved in the archive of the Bavarian Administration of State Castles, Gardens, and Lakes. Hitherto undocumented in the organological literature, this manuscript consists of 33 leaves contained in an original binding, presenting a total of 25 pages of writing, including the front cover. According to the custom at the Bavarian court, the inventory was probably produced in three copies: for the office of the financial minister (Hofkammer); for the administrator having direct responsibility for the instruments; and for his superior, the court minister whose charge included the supervision of musicians and their instruments. This minister, for whom the present copy was prepared, was called the Oberststallmeister (literally the Head Master of the Horse), and the place of musical equipment in the Bavarian court's administrative organization is further revealed by the fact that this document was found among a large number of similar inventories of horses, sedan chairs, coaches, and sleighs.

Bettina Wackernagel is known for her research on historical musical instruments in Bavaria. Her fine catalog of instruments of the sixteenth through the eighteenth centuries in the Bayerisches Nationalmuseum was reviewed in the *American Musical Instrument Society Newsletter* 29, no. 1 (winter, 2000): 14–16. Her present work is also a valuable contribution to the field. It presents a complete facsimile of the 1655 inventory (accounting for 25 of the book's 45 black-and-white illustrations), a diplomatic transcription of the text, and extensive commentary.

The inventory is written in an ornate hand that leaves a luxurious amount of space, including a wide left margin, on every written page. The orthography of the text is highly idiosyncratic, but even words like "Positiphl," "helfenpain," and "Gsengbiecher" can be understood through phonetic pronunciation by any reader with a knowledge of modern German. The diplomatic transcription is made in accordance with announced conventions, such as the interchanging of the letters *v* and *u* to reflect modern usage, as well as the editorial addition of punctuation marks to clarify the meaning of the text. Some of the stated editorial procedures are not followed consistently, however. In spite of the indication that original capital and lower-case letters have been retained, the transcription presents all headings in caps and small caps—a modern typographical nicety that does not match the calligraphy of the manuscript. Original abbreviations are said to be written out in full without notice, and this statement might reasonably be taken to pertain to all abbreviations, yet many are carried over as they are into the transcription. Finally, the transcription does not retain the ornamental periods used to separate cardinal numerals in the original; this practice seems valid, but it should have been included in the list of editorial procedures. All of the abovementioned flaws are minor aspects of style, of course, and do not affect the substance of the transcription, which is accurate in the important matters.

The inventory organizes the instruments into categories that seem unequal musically, but must have made sense to the anonymous scribe. Separate headings are given for positives; regals; stringed keyboard instruments (*Instrumenta*); bowed string instruments (*Violen und Päss*); and lutes, theorbos, and harps. But citterns, liras da braccio and da gamba, a scheitholt, a guitar, and a pandora are all lumped together into one category (*Citteren, Lyrae und Chithariglia*); and the most inclusive single category (*Schalmehen, Fletten, Cornet und Pusaunen*) is a conglomeration of

shawms, various weapons (including shawms in the form of weapons), dulcians, rackets, recorders, transverse flutes, cornetts, mute cornetts, crumhorns, trombones, instrument cases, and miscellaneous accessories. A further category comprises empty cases, cloths, carpets, and various pieces of furniture, while the last category contains similar items found in the court chapel.

Bettina Wackernagel has examined a large number of archival sources to acquire information on the acquisition and use of musical instruments by the Bavarian court and further to try to identify any items listed in the inventory that may still survive. Given the extent of the fire in 1750, it is not surprising that none of the instruments can be located today (although the round limestone table-top, richly etched with musical notation, planets, and the Bavarian coat of arms, made in Passau in 1591 and presently found in the castle museum in Berchtesgaden, may be the "rund Stainene geözte Tisch" that appears in the inventory at the bottom of fol. 17v). Although the trail has long grown cold, Wackernagel nevertheless fulfills her responsibility to describe and clarify every inventory entry in her commentary, which constitutes the largest part of her book. It follows the order of the inventory exactly, presenting general historical information about each instrumental category and interpreting each individual listing in full, drawing on important historical sources and surviving examples (even though they cannot be linked directly with the inventory) in order to give the fullest possible explanations of the listed instruments. The commentary also presents modern equivalents of archaic words found in the inventory. In addition, Wackernagel discusses instruments not listed in the inventory, such as trumpets, which were under the jurisdiction of a different court minister and were stored separately from the other instruments. She also gives a fascinating account, supported by historical illustrations, of the chronicle of the Neuveste from the sixteenth century through its destruction in the fire of 1750 and its replacement by a new building in the early nineteenth century.

This book is enhanced by a genealogical tree of the House of Wittelsbach, a list of cited museums, a bibliography of archival sources and published works, and an index of cited persons. A significant publication in the field of Bavarian music history and the history of musical instruments of the sixteenth and seventeenth centuries, this work also serves as a model of documentary presentation and study.

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**Andy Nercessian. *The Duduk and National Identity in Armenia*. Lanham, MD: Scarecrow Press, 2001. v, 141 pp.: transcriptions, appendixes. ISBN: 0-8108-4075-8. $35.00 (cloth).**

An instrument's invention, survival, death, and possible revival depend upon many cultural determinants. To withstand the test of time, an instrument must be flexible enough to accommodate fresh repertoire, compete with new technologies, and adapt to changing contexts. Sometimes an instrument and the events connected with it are suppressed or controlled by political or religious forces, but the instrument's sound and image persist in secret or reemerge as defiant emblems of resistance, survival, and identity. The latter situation is documented by Andy Nercessian, whose fieldwork during the 1990s forms the basis for his dissertation-like book, *The Duduk and National Identity in Armenia*. Nercessian, using a historical and sociocultural approach, attempts to explain how the duduk (pronounced *doo-dook*), a conical double-reed instrument similar to others found in West and Central Asia, became "the most 'Armenian of all instruments' " (p. 3).

The book is divided into four interrelated parts that sequentially build an explanation for how Armenians selected the duduk, its sound, and its image as embodying the national experience. Part 1, "Preliminaries," the first four chapters, sets the stage with information about the author and his previous exposure to the instrument; a cursory description and history of the duduk; a survey of problems in organological theory concerning interpretation of context and meaning(s); and an overview of Armenian history, including factors such as religion, nationalism, genocides, and *Korenizatsia* (Soviet cultural policies) that have shaped national identity. Here Nercessian grapples with the idea of a polysemous approach to studying an instrument: context may prompt so many meanings that the preeminence of one or other of these within society needs to be explained. He suggests that musical instruments and their meanings should be analyzed through a "trialectic" that takes into consideration the instrument's physicality, its context(s), and its audience.

Part 2, "The Centrality of National Identity to Perceptions of the Duduk," focuses on the duduk's history beginning with the 1920s, since—with the exception of some archeological evidence—there is a lack of earlier performance data and actual instruments. This invites the question of whether the current practice is based on an older tradition or if it is an invention influenced chiefly by centuries of Russian rule and

cultural influence and manipulation. Building upon ideas advanced by Theodore Levin, Nercessian illustrates how Russian influence was intensified and redirected by Marxist-Leninist *Korenizatsia* policies. Soviet-imposed practices included three main elements: Europeanization (establishment of conservatories, formation of ensembles of folk instruments, use of notation) as a means of "cultural advancement"; elimination of cultural forms which distinguish class differences or a folk-classical dichotomy; and "preservation" of "national" elements by standardizing and "improving" indigenous instruments. Using this scheme, a somewhat artificial, nationally unifying culture was conceived. Likewise, broadcasts and recordings of newly created folk ensembles and orchestras using new arrangements, and the introduction of notation, the diatonic scale, and duduk studies in conservatories contributed to a duduk consciousness as Armenia moved from the agrarian society associated with the instrument to an urbanized one. Recordings and films featuring the duduk, the rise of virtuoso performers such as Djivan Gasparyan, the instrument's occasional use at political demonstrations during the 1960s, and its promotion by pop artist Brian Eno raised the instrument's status to that of a "symbol of Armenianness." During the post-Soviet decade, Gasparyan incorporated the duduk into other types of music, recording with well-known Western orchestras and taking a prominent musical role in the film *The Last Temptation of Christ*. These syncretic styles established Gasparyan as an international artist and as a musical representative of Armenia who promoted the melancholic sound of the duduk. This use of the instrument differs from the traditional one, which is the focus of the book's third section.

Part 3, "Context as Prime Determinant of Meaning," chapters 7–9, reveals various contexts in which the duduk is found. Describing his fieldwork and taking the musician's point of view, the author guides the reader through the musical process of an Armenian funeral, from hiring the *dudukahars* (duduk players) to their final performance at the grave. Nercessian points out that this is the strongest traditional association of the duduk for Armenians. This tradition, revitalized after the Soviet era, reinforces Armenian sentiments that the duduk is an instrument that, although used on happier occasions, best expresses sadness and melancholy. This concept is supported by Aram Khachaturian, Alan Hovhannes, and other composers, who feel that the instrument's sound embodies the history and pathos of a people long oppressed by a series of conquests and subjugations. The author suggests that it is this attitude

held by the Armenian people that empowers the duduk to make listeners feel deeply, and thus raises the instrument's status.

Other contexts such as solo competitions and national celebrations represent a return to traditions lost during the Soviet era. Alongside these more time-honored forms, the folk orchestras established as part of Soviet policies around 1926 continued to provide musicians with employment opportunities. Such ensembles, incorporating non-traditional duduk concertos, offer musicians an opportunity to play uniquely Armenian music, and the international exposure of these ensembles, through television, recordings, and live concerts, has become a way of representing Armenian culture to others. This context also provides musicians with a channel through which they can achieve national and international status and "allows for an interaction with the transcendental idea of nation, the provision of cultural substance to a large community" (p. 71).

The final chapter discusses the distinction between a real and perceived past and questions the concept of cultural memory as embodied by music and an instrument within changing contexts.

Six appendixes follow: transcriptions; a detailed description of the duduk and its playing technique; a statement about the repertoire; measurements used in duduk construction; an Armenian chronology; and the worldwide distribution of Armenians for 1988.

The complex and highly commendable case study presented in *The Duduk and National Identity in Armenia* does not represent a culturally rare phenomenon. Rather, it highlights one culture and its construct of identity, as embodied by the physical presence and sound of the duduk. And it provides a useful model for other scholars who might wish to carry out similar studies on the creation and maintaining of symbols. Organologists constantly deal with issues of context as part of their interpretive method; it is context that defines the meaning of the object within the culture. But Nercessian seems to voice the general perception that organologists only concern themselves with description and construction details and that they should follow his lead by presenting a contextual analysis. Certainly, many ethnomusicologists have for years been trying to present more holistic studies of music and instruments and their role in society. In Alan P. Merriam's 1964 book *The Anthropology of Music* (Chicago: Northwestern University Press), we are advised to ask: "Is there present in the society a concept of special treatment of music instruments? Are some revered? Do some symbolize other kinds

of cultural or social activity? Are particular instruments the harbingers of certain kinds of messages of general import to the society at large? Are the sounds or shapes of particular instruments associated with specific emotions, states of being, ceremonials, or calls to action?" (Merriam, p. 45).

The foreword to Nercessian's book, which was pasted into my copy, reflects a notion that many musicians perpetuate concerning museums and curators. Written by composer Benedict Mason, it accuses curators, Western ones in particular (I do not know why), of condemning instruments to "become artifacts, rather than living things that can be restored or remade and given a continued life." He implies that instruments should be played and repaired. But curators have learned through experience that such activities wear out the instrument and destroy evidence —it eventually ceases to be part of the historical record for researchers like Mason, who constructs instruments, and loses its documentary value to someone like Nercessian. This unfortunate and misinformed attitude, presented at the start of the book, made me wonder about the author's understanding of the field, if he was familiar with museological standards, and if he actually knew any curators in major collections.

While the book's information is compelling, revealing, and useful for understanding the variable dynamics at work in the production of a symbol, its lack of technical drawings, photographs, recordings, and a discography—more or less standard features in a work of this type—limits its usefulness in achieving a fuller understanding of the duduk as an instrument.

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**Murray Campbell, Clive Greated, and Arnold Myers. *Musical Instruments: History, Technology, and Performance of Instruments of Western Music.* Oxford: Oxford University Press, 2004. x, 510 pp.: 45 black-and-white plates, 91 figures, 4 tables, 32 musical exx. ISBN: 0-19-816504-8. $230.00 (cloth).**

First, the price: Although this volume is dense with data and handsomely produced, its publisher can hardly have expected many buyers to pay the full retail price either in dollars or pounds. Even at a 30 percent discount for on-line purchases, the book's cost puts it out of reach of most individ-

uals and many libraries. Those able to afford the book will find it a handy source of information on many instruments of Western "literate" musical traditions, including some less familiar types both old and new. However, instruments primarily associated with folk music, such as the banjo, are mostly bypassed, resulting in an odd imbalance, considering the space devoted to, say, the cinema organ and electric guitar. The book is no substitute for *The New Grove Dictionary of Musical Instruments* (Stanley Sadie, ed., London: Macmillan, 1984), which now seems a bargain in comparison, nor does it replace standard surveys of the history of instruments, orchestration, or performance practice, or even Campbell and Greated's more comprehensive *Musician's Guide to Acoustics* (1987; repr., London: Oxford University Press, 1998).

The four authors (Patsy Campbell wrote portions dealing with viols) concentrate on providing an introduction to how instruments work in acoustical and mechanical terms, and in this respect their teaching experience at the University of Edinburgh shows to advantage. Explanations enlighten as far as they go (the text addresses college-level readers, not scientists or musicologists) and are amply supplemented with mathematical formulae, graphs, and diagrams—perhaps more than most musicians will find essential to their comprehension. Treatment of brasswinds in particular shows the benefit of research by Arnold Myers and his colleagues, more fully reported elsewhere (for Myers's publications see http://homepages.ed.ac.uk/am/pvl.html). Playing techniques, too, are treated sensibly if briefly. However, the historical content is neither original nor entirely trustworthy, and too often it seems cluttered with facts of no apparent significance. For example, what is the point of saying, in connection with "special effects for avant-garde performance" (p. 348), that Friedrich Wilhelm Rust's clavichord sonata was published in 1939, if we're not told where to find that modern edition (Rust died in 1796) or which sonata is meant?

An overview of the book's contents will indicate its ambitious scope. The first chapter introduces general acoustical principles, clearly explaining the nature and propagation of sound and defining concepts of hearing and cognition, pitch, timbre, tuning, loudness, and other elements. Chapter 2 relates the commonplace classes of woodwinds, brasses, strings, percussion, and electronic instruments to the more systematic Hornbostel-Sachs scheme, then shows how sound is produced in each family and subfamily, differentiating among cylindrical, conical, and flaring tubes; single-reed, double-reed, lip-reed, and air-jet excitation;

plucked, hammered, and bowed strings; analog and digital generation of electronic musical signals; and so on. The behaviors of air columns, stretched strings and membranes, and vibrating bars, plates, and tubes are succinctly described.

With knowledge of this introductory material and of basic physics terminology and music notation assumed, the following eleven chapters look more closely at the salient acoustical principles, operation, construction, historical development, and some traditional and modern performance practices of, in turn, reed-sounded woodwinds; flutes (using the term broadly); bugles and horns; trumpets and trombones; pitched and unpitched percussion, including drums; bowed strings; plucked and hammered strings; clavichord and harpsichord; pianoforte; pipe organ; and electronic instruments. Three appendixes provide (1) a table of pitches and frequencies in equal temperament at a′ = 440 Hz; (2) keywork tables for typical woodwinds—that is, a list of the most common keys and their functions; and (3) a list in order of length of common sizes of ordinary brass instruments, expressed as their nominal sizes (4-foot C, 6-foot F, etc.) and equivalent cone lengths (not actual tube lengths) in meters.

A combined glossary and index extends the book's usefulness by summarily describing instruments that are not discussed in the main text and by providing other concise definitions and biographical data, though most readers will already know that Beethoven was a composer, if not that he used the "clarichord" (*sic*). Arnolt Schlick and Curt Sachs surely deserve better than the one-word descriptor, "author." The glossary would have helped general readers by defining more specialized terms such as newtons, since it is annoying to have to hunt for meanings elsewhere.

The well-illustrated text is entirely self-contained; no notes lead the reader to more detailed discussions or supporting evidence. In lieu of a thorough bibliography, a short guide to further readings, exclusively in English and rather parochially weighted toward recent British books, accompanies each chapter. Journal articles are all but absent among the indicated readings, so important relevant literature is overlooked: fundamental research by John Koster and Grant O'Brien (who was, until recently, curator of the University of Edinburgh's own Russell Collection of Early Keyboard Instruments) concerning early keyboards; recent discoveries about early violins; exciting experimental work on organs underway at the Göteborg Organ Art Center in collaboration with Chalmers

Technical University; even seminal articles by leading music acousticians —all escape notice. Iconographical and older musicological publications bearing on organology are largely ignored, as are performance practice studies reported in periodicals. This bibliographic shortcoming alone belies the publisher's jacket blurb claiming the book to be "the essential reference for everyone researching and working with musical instruments and performance."

Lest all this criticism seem unfair, some specifics are necessary; I shall limit these to struck-string keyboards. (The inevitable typographical errors, such as "nearly nearly" on page 363, cause little concern.) Page 315: "[clavichords] typically used two different metals for the strings, brass in the bass and steel in the treble," yet on page 326: "Strings on a clavichord are normally made of either brass or iron"; so are steel and iron supposed to be synonymous or interchangeable? Page 359: ". . . Johannes Zumpe, a former pupil of Gottfried Silbermann"; this is unproven, as we learn from Michael Cole's book cited in the "Further Reading" for this chapter but evidently not read by our informant.[1] Page 361: "Broadwood . . . optimized the striking position of the hammers on the strings, choosing a striking point about one ninth of a string length from the end"; measurement of Broadwood's striking points discredits this fusty myth.[2] Also on page 361: ". . . in 1859 Henry Steinway obtained a patent for a metal framed overstrung grand . . ."; correctly, the patentee was Henry Steinway Jr., son of the firm's founder.

Page 362: "The early part of the [twentieth] century was a peak time for the piano industry, with practically every other household in Europe and America being the owner of an instrument"; truly, or a hyperbole? Page 363: "The fact that the [grand piano's] soundboard is horizontal, rather than vertical, is also an advantage"; precisely what is this advantage, and to whom? Page 367: "Overstringing . . . allows a greater length of string to be used for a given frame size" and "means that the [piano's] bridges are more centrally placed on the soundboard . . ."; Paul Poletti convincingly disputes these assertions.[3] Page 372: "It is important that

1. Michael Cole, *The Pianoforte in the Classical Era* (Oxford: Clarendon Press, 1998), 56.

2. John Koster, "The Divided Bridge, Due Tension, and Rational Striking Point in Early English Grand Pianos," this JOURNAL 23 (1997): 5–55, especially p. 41.

3. Paul Poletti, "Steinway and the Invention of the Overstrung Grand Piano Frame," in *'Matière et Musique': The Cluny Encounter*, ed. Claire Chevallier and Jos van Immerseel, 241–63 (Antwerp: Labo 19 and Alamire, 2000).

[piano] soundboards are varnished, in order to seal the surface; otherwise the natural resins in the wood tend to evaporate over a period of time, causing the resonance characteristics of the board to deteriorate"; what experimental evidence supports this claim, and if it is true for pianos, why not for harpsichords and clavichords, whose makers historically did not varnish soundboards (made of presumably well-aged wood), while violin makers famously use varnish but only on the outsides? Finally, the eleven-page discussion of piano tone control, performance style, "great pianists of the nineteenth century," national schools, pedaling, and contemporary trends is occasionally so cursory as to be funny: "Recent exponents of the international school . . . execute authentic and literal interpretations of compositions from a broad repertoire . . ." (p. 380); what on earth are authentic and literal interpretations?

These discomfiting quotations do not necessarily represent the text as a whole. The discussion of aerophones seems better informed and more reliable (though I have not elsewhere encountered the term "hot potato" rather than "sweet potato" in reference to ocarinas, p. 124), if admittedly somewhat simplistic; windstream and air column behaviors in real instruments are by no means fully understood. It is a good sign that the bowed string chapter acknowledges the contributions to violin acoustics of Carleen Hutchins and her collaborators. The book would have benefited from attention to other ongoing investigations such as Christophe D'Alessandro's on clavichord acoustics; his analyses paint a subtler picture of how real instruments behave.[4] Incidentally, the description of organ tuning methods omits cone tuning, a standard historical method for metal pipes. On the other hand, instructions for cleaning a flute seem superfluous.

In summary, the authors deal competently, even imaginatively, with the elements of musical acoustics, instrument mechanics, and playing methods, but offer no fresh insight into the evolution of Western instruments, much less into performance styles. Despite its lapses, the book has value as a broad compendium and so will find a place on library reference shelves, if not in many homes or classrooms.

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4. Christophe D'Alessandro and B. F. G. Katz, "Tonal Quality of the Clavichord: The Effect of Sympathetic Strings," in *Proceedings of the International Symposium on Musical Acoustics, Nara, Japan, March 31–April 3, 2004*, 21–24 (ISMA, 2004).

**Robert Barclay. *The Preservation and Use of Historic Musical Instruments: Display Case and Concert Hall.* London and Sterling, VA: Earthscan, 2004. 303 pp.: 28 black-and-white photographs, 2 graphs, 4 drawings, 1 diagram, 16 tables. ISBN: 1-84407-127-8. £31.50 ($59.55) (paper).**

Robert Barclay is a Senior Conservator at the Canadian Conservation Institute. Since 1975 he has specialized in the care and preservation of ethnographic material, wooden objects, and musical and scientific instruments. He served as Secretary/Treasurer to the International Musical Instrument Committee (CIMCIM) of the International Council of Museums (ICOM) for two terms, and he has taught courses on the conservation of organic materials, wood, and metal for African conservators through the International Centre for the Study of the Preservation and Restoration of Cultural Property's PREMA Program, both in Rome and in African countries. He is well known to the organological community as the author of *The Art of the Trumpet-Maker: The Materials, Tools, and Techniques of the Seventeenth and Eighteenth Centuries in Nuremberg* (Oxford: Clarendon Press, 1992), for which he received the Bessaraboff Prize from the American Musical Instrument Society. He has also written *The Care of Historic Musical Instruments* (Edinburgh: Museums and Galleries Commission; Ottawa: Canadian Conservation Institute, 1997) and several articles concerning conservation of musical instruments. Barclay received a Ph.D. in musicology from the Open University (UK) in 1999.

This book, a revision of Barclay's Ph.D. dissertation, concentrates on the social aspects of intervention as related to musical instruments—not simply what was done, but why it was done. The first nine chapters deal with what makes an instrument historic; categorization of terms; history of the craft tradition; currency; conservation; restoration; restoration and reversibility; preservation; and an analytical method for the eight case studies in chapters 10–17. These studies explore the cultural reasons for the restoration of musical instruments.

Barclay discusses the tension between those who favor restoration of instruments to a playing state and those who argue for preservation in a non-functioning state. As a curator of a large musical instrument museum, the reviewer has experienced this tension first hand. In fact, any curator, conservator, collector, or individual responsible for a collection will eventually have to grapple with what and how much to restore, or whether to preserve an instrument in its present condition.

Barclay describes three categories or states for a functioning musical instrument: (1) primary state when new and unused; (2) state when it was first used to perform music; and (3) state as modified through use. He carefully defines the terms to be used in his discussion. Restoration is "all actions taken to modify the existing materials and structure of a cultural property to represent a known earlier state" (p. 17); this assumes the use of tools to change the existing state. Conservation is "all actions aimed at the safeguarding of cultural property for the future with the least possible intervention" (p. 17); this action avoids an intervention with tools if such intervention alters the instrument.

These definitions come from CIMCIM's Conservation Code of Ethics, but they do not deal with motives or social values. Barclay addresses this problem by introducing three regimens or frameworks for evaluating conservation concerns: "(1) Currency: the instrument continues in use, being maintained in working condition, and adapted to suit changes in musical fashion. Instruments in this regimen are already in working condition, and craft action upon them is maintenance. (2) Conservation: the current state of the instrument is respected, and it is preserved from further intervention. Instruments in this regimen are kept in a non-playing state, and action upon them is described as conservation treatment. (3) Restoration: the instrument is 'returned to' and maintained in a state that is assumed to represent some previous period of its existence. Instruments in this regimen are obsolete and in a degraded condition, and craft action upon them is restoration followed by maintenance" (pp. 19–20).

Barclay provides a table for the actions and lists rationales for each of these three regimens. For currency, "subjective attributes are assigned to the instrument, and achievements of makers and users are imbued with emotional value. Physical transformation of the instrument is not seen to interfere with its subjective attributes" (p. 22). For conservation, "application of the scientific method to the study and preservation of the instrument reflects pragmatic thinking. Subjective responses are relegated to the status of transient personal phenomena" (p. 22). For restoration, "there is positivistic belief in the possibility of recapturing a definitive previous state of the instrument. The instrument is used as a medium in re-creating a past cultural ambience" (p. 22).

Chapters 10–17 are the case studies: a piano owned by Glenn Gould; a string quartet of instruments made by members of the Amati family; a barrel organ by Richard Coates; virginals by Marco Jadra; a collection of

new instruments made by Canadian makers; a Kirckman harpsichord; another piano owned by Glenn Gould; and a square piano by Zumpe. Each study includes an introduction and explanation of the use and state of the instrument; sections on analysis, context, and dissonances between the regimens of restoration and conservation; and description of any intervention, conservation, or restoration accomplished. At the conclusion of each study there is a table of the regimens of currency, conservation, and restoration, with the actions and rationales for each.

Chapter 18 addresses an important question concerning instruments that have been radically rebuilt in order to be kept in playing condition. "Why can we still refer to Glenn Gould or Richard Coates or Nicolò Amati as if they are somehow still resident in these collections of worked-over materials? The answer lies in the dominance of objective values by subjective ones, in the capability of feelings to displace or to relegate knowledge. In all cases, the emphasis is on values not associated with the materials and physical disposition of the instrument. This is clear from the way in which these objects are treated" (p. 205). And further on: "There is a clear belief that use of the object has preservative qualities. However, when considered closely, this assumption is valid only because, in the regimen of Currency, use implies servicing which, in turn, implies replacement of worn parts—in short, maintenance. The focus is deflected away from the materials of fabrication which are valued only as long as they perform their function, and are considered entirely replaceable without penalty" (p. 206). Barclay also provides a rationale for currency: "Making music and enjoying the results are the drivers of Currency, after all. But there is a fallacy in trying to discriminate features of the tone of an instrument and by extension to ascribe qualities to them" (p. 206).

Chapter 19 covers conservation, with an emphasis on the preservation of the instrument in a non-playing state. Chapter 20 argues that it is a practical impossibility to restore a musical instrument to a previous state; even so, restorers continue to restore them. Chapters 21 and 22 discuss the pros and cons of restoration and provide an objective decision-making protocol concerning restoration, maintenance, and conservation. The factors that should be considered are: How rare is the instrument? What state is it in now? Has it been altered or transformed? What condition is the instrument now in? Can it be made playable? These questions suggest three categories that form a matrix of factors for consideration: rarity, fragility, and state. Barclay assigns numerical values

comparing fragility and rarity with state. The numerical values are then used as a key to the amount of use an instrument can sustain. Barclay provides protocols for numerical values from 1 to 7, ranging from "there are no circumstances under which the instruments should be played" to "instruments assigned this numerical value are durable and of low heritage value. They can be used for didactic purposes . . ." (pp. 239–40). An appendix called "Calendar of Sources" provides a historical chronology and explanation of published sources concerning restoration in general, restoration techniques, and significant publications dating from 1833 to 1998 in particular. Notes and a bibliography close the book.

Who is the audience for this book and who will benefit most from it? Clearly, the book addresses curators, conservators, collectors, museum trustees, and individuals in charge of collections of musical instruments. Barclay admirably covers a difficult and treacherous subject in a very complete manner. The text reads well, even though the repetition of actions and rationales throughout the case studies can be annoying—the editor should have been able to prune some of the more verbose sentences. One or two important sources are not listed in the bibliography. But these are minor criticisms. This book is highly recommended to college, university, and public libraries and to all museum personnel and individuals who own or are involved with musical instruments.

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**Bruce Haynes. *A History of Performing Pitch: The Story of "A"*. Lanham, MD, and Oxford: Scarecrow Press, 2002. lvii, 569 pp.: 4 black-and-white photographs, 36 graphs, 27 tables, bibliography. ISBN: 0-8108-4185-1. $85.00 (hardcover).**

This is a remarkable book, and it's too bad so few people will actually read it. Yes, a lot of people will *see* it, but they will dip in on the way to something else—for a quick check on, say, which *corps de rechange* to use for a particular work by Telemann. It will be a success that way, I'm sure: no one who performs early music will go many months at a time without consulting it. But as the subtitle (a good one, by the way) implies, there is a story here too, and a story of surprisingly broad musical interest.

How did pitch standards originate, and how did they evolve over the centuries and in different parts of the world? It's a simple, basic ques-

tion, a matter of physics and numbers ultimately, but there is only one way to go about answering it: to assemble many tiny bits of data, pull the important information in each of them out from the maddening mire of interpretation, and painstakingly shape them into a coherent account. Bruce Haynes has been at this for many years (the book grew out of his doctoral dissertation), and his method is a model of patience, rigor, musical experience, and sanity.

Haynes's boldest methodological stroke, visible in one form or another on almost every page, may also be his most controversial. As an oboist himself, he recognizes the absurdity of expressing individual pitch standards in terms more precise—say, down to tenths of a Hz—than anyone's ears can sustain. So he simplifies and clarifies things a great deal with a system that starts with a′ = 440 and works its way out by semitones, so that any pitch level from 428 to 452 he calls A+0, anything from 409 to 427 he calls A–1, and so forth. You can see the appeal of this system, which has the double advantage of communicating quickly with twenty-first-century readers and muscling a welter of numbers into manageable rows. The danger, of course, is that the system has a way of making things look more clear-cut than they are; and careful readers will be especially wary of numbers near the borders of his rows, judgment calls that might have gone another way. Mind you, I mention this as a caution and not a criticism. The actual numbers are there, well organized and accessible to anyone who wants to reinterpret them: the appendixes, for example, provide more than fifty pages of tables showing the measured and reported pitches of historical organs, cornetts, flutes, recorders, and pitch-pipes, which should be plenty to keep any skeptic busy. For me, the A± system is a good example of what Haynes does extremely well: he is not afraid to take rather heroic steps to make his story communicate.

Even more welcome is his success in clarifying the contemporary vocabulary, or rather vocabularies, of pitch. Bad enough, I had always thought, that pitch standards varied from place to place, and that we so often have no explicit information at all; but to see the sparse data then confounded further by the side-by-side existence of *Chorton*, *Cammerton*, *Cornett-ton*, *tief-Cammerton*, and so on, not to mention *Quire-pitch*, *Ton d'Opéra*, and everything else in other countries and centuries, just seemed to plunge the whole business into an Enigma Code for which we had not recovered the machine. But Haynes makes perfect sense of it, and even manages to account for changes in the way the various vocabularies were used over time. It's an amazing piece of patient reasoning,

and the implications are much bigger than one might expect—as he demonstrates in a chapter on "Sebastian Bach and Pitch," in which we can see how modern editions of Bach, with all the parts transposed to the same level, misrepresent what his actual performers did, with the strings tuned to one pitch standard, the organ at another, the winds at one or two others.

I find myself resisting his narrative only at the very beginning, in the first few pages of chapter 2, where he writes of the medieval and renaissance roots of pitch standards and the irrelevance of such standards in *a-cappella* vocal institutions. Haynes expresses himself carefully and soberly and brings in a few documents I had never seen; still, the idea that, unencumbered by instruments, singers could put the pitch level of a piece anywhere they felt like, has always seemed to me a bit of a copout. Tinctoris's long discussions of "irregular modes," for example, which are essentially transpositions of the regular modes up or down via key signatures, would seem to imply that written pitch levels meant something to singers, and the extensive use of *chiavette*, or high clefs indicating small downward transpositions, in the sixteenth century further belies the notion that singers' pitch levels were a matter of local whim. But I admit this is more qualm than quarrel, and that we are all on much firmer terra for instruments than for voices.

In short, as soon as I finish this review, the book will take a proud place among my reference collection, and I am going to put it where I can get at it easily. So, I am sure, will many of you. But as I say, it is also worth reading through from beginning to end. We all know the history of Western music told as a story of composers—or composers and patrons, or composers and markets. To read Haynes's book is to see it as the story of musicians, real musicians like us, struggling to do good work without driving themselves crazy. Historical pitch standards today—let us face this frankly and bravely—are a pain, for string players who must crank their instruments up and down, for harpsichordists whose movable keyboards confine them to equal temperament or require frequent complete retuning, for wind players who have to keep buying new instruments for every repertory. And there is a human comfort in seeing that they were a pain back then too. This is a beautiful piece of intelligence-gathering, thinking, and writing.

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