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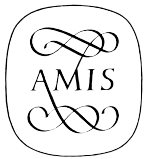

Reviews

Sibyl Marcuse. *A Survey of Musical Instruments*. New York: Harper & Row, 1975. 863 pp. $20.00.

Basically an updated expansion of Curt Sachs' *Handbuch der Musikinstrumentenkunde* (1920) whose familiar classification system Marcuse closely follows, this straightforward *Survey* outlines the astonishing variety of instruments created throughout the world from prehistory through the nineteenth century. Unaided by any introduction explaining the author's choice of examples, readers are left alone to discover some surprising gaps in coverage. Blown idiophones, mentioned in Marcuse's succinct *Encyclopædia Britannica* article "Percussion Instruments" (15th ed., 1974, vol. 14), are neglected; they are rare, but not more so than some kinds that are included. Electrophones are ignored as a group and other twentieth-century developments are slighted, though the text weighs heavily in favor of Western instruments, especially those of art music. Keyboards alone receive fully one-fifth of the book's attention. But enough information appears about non-Western, folk, and ephemeral types to give diligent readers a generally better-than-superficial—if perhaps unbalanced—overview. Realistically, this is all that might be expected of a popular descriptive survey that, avoiding thorough analysis of problems and principles, lacks compelling original conclusions. A case in point is Marcuse's inconclusive discussion of the chekker (pp. 242–244). Elsewhere Edwin Ripin (*Galpin Society Journal*, XXVIII [1975]) offers persuasive reasons for identifying the chekker with the clavichord, and suggests a plausible derivation of its name that has nothing to do with a hypothetical "innovation in keyboard pattern."

Marcuse assembles a vast array of independently interesting facts from an impressive body of secondary sources, seasoned with

personal observations. To the frustration of readers wishing to look more deeply into specific matters, however, her sources are most inadequately identified; this is a fundamental and severe failing. Unfortunately, too, for those who might trust the book's accuracy, factual errors and oversights—many trivial, some important—abound. Ordinary oil drums, incidentally never the only material used for making steel drums, contain fifty-five gallons, not fifty (p. 53). The Victoria and Albert Museum's giant double bass has a belly length of over 200 cm., not 173 cm. (p. 545). The oldest surviving baryton's date appears as both 1656 and 1756; the latter is wrong, but not a typographical error (pp. 509f.). Under the inappropriate heading "Multiple Flutes Outside Europe" (p. 589) the pu torino is mistakenly described as a conoid flute; without mention of its name it is better described as ovoid under "Flutes of the Pacific" (p. 581); however, it may be lip-vibrated as well as edge-blown. Nunuts (p. 110 f.) usually have four tongues, not three, and while these may be concave on one surface (the block itself is not hollowed), nunuts may as well be classified among friction bars as vessels. The "1778 Stein" pedal piano preserved at the Metropolitan Museum of Art (no location cited; p. 355) is actually a ca. 1790 Schmidt whose short-octave (!) pedalboard extends to notes *below* the manual keyboard's lowest strings. The 1720 Cristofori piano's original compass was apparently GG–c3; the range cited (p. 320) is owed to a later rebuilding.

To judge from the nature of such flaws and from publication dates of 280 "Works Referred To . . ." (which list substitutes inadequately for a full bibliography), the *Survey* falls about ten years out of date. Recent research, especially on folk instruments, corrects and amplifies Marcuse's descriptions; this is inevitable in the case of a study that must have taken many years to accomplish. Still, a greater effort to confirm facts might have been made closer to the time of publication. As a further annoyance, the index is so haphazard that much information buried in the text remains more easily accessible elsewhere, notably in Marcuse's own valuable *Comprehensive Dictionary* whence some material is taken almost verbatim: compare the Apollonicon and calliope descriptions (pp. 650–651) with their *Dictionary* entries. Readers of the *Survey* will

want to have the *Dictionary* at hand for its helpful cross-references and list of sources.

Though hardly adequate for the needs of specialists, the *Survey* nevertheless presumes heavily on casual readers' skills. While giving an impression of comprehensiveness and clear organization, the book demands the ability to recognize shortcomings in the classification system implied by the table of contents. For example, it is nowhere made clear that keyboard chordophones generally are a subcategory of box zithers, rather than, as it appears, a separate family equivalent to zithers, lyres, lutes, and harps. Mirlitons, bell substitutes, and so on elude cubbyholes; references to them are scattered throughout the book with no means of bringing them together. Marcuse employs terms that not only escape the book's little glossary but also Webster's *Unabridged* and sometimes the proofreader (e.g., truncoconoidal, or troncoconoidal in several places; monoxylous; petrifact). (I suppose the approach of lepers could be described as "impeding" [p. 5] but I suspect "impending" was meant.) Unnecessarily obscure words aside, Marcuse's prose is lucid and at times refreshing. The paltry illustrations (only 39 as against 156 in Sachs' much shorter *Handbuch*) do not share this distinction: ten from Praetorius should be too familiar to warrant fuzzy reproduction; Robert Sheldon's encased horn shows to much better advantage in its *Dictionary* photo; the passing mention (p. 496) but full-page illustration of Gaudenzio Ferrari's fanciful *Child with a Viol* does iconographic injustice to Emanuel Winternitz's penetrating study of Ferrari (in G. Reese and R. Brandel, eds., *The Commonwealth of Music . . .*, 1965; reprinted in Winternitz, *Musical Instruments and Their Symbolism in Western Art*, 1967), where a sketch for this painting is shown with greater justification in relation to the history of the *violin*; only four illustrations show real non-Western instruments.

For all its obvious faults, Marcuse's imposing compilation is destined to be widely read and cited. In fairness, its coverage is broad within certain limits and occasionally deep. The author deserves admiration and sincere thanks for having undertaken such a demanding task. While many details are subject to correction and some of its assertions open to controversy, the book is indeed

fascinating to peruse. There remains the question whether this kind of quasi-encyclopedic survey, a pioneering effort in the hands of Sachs, fulfills expectations of half a century later. This reviewer believes not.

LAURENCE LIBIN

Lenz Meierott. *Die geschichtliche Entwicklung der kleinen Flötentypen und ihre Verwendung in der Musik des 17. und 18. Jahrhunderts*. Würzburger Musikhistorische Beiträge (Wolfgang Osthoff, Editor), vol. 4. Tutzing: Hans Schneider, 1974. 279 pp. plus 33 black-and-white plates. DM 80.

Lenz Meierott's study of the development of small flute types (flageolets, recorders starting on c^2 or higher, other little duct flutes with fewer fingerholes, one-hand flutes or galoubets, small fifes, and piccolos) and their use in music of the seventeenth and eighteenth centuries draws on a remarkable wealth of sources. Soundly researched and well documented, it fills an important gap in recent instrumental studies for, as the author points out, the development, playing technique, and musical use of the small flute types, which often strongly depart from those of the larger flutes, have been treated heretofore only marginally. The flageolet, perhaps the most overlooked of all these instruments in recent literature, is given the fullest treatment; indeed the author's occupation with it gave the impulse to the rest of the study. But his inclusion of other small flute types is essential, since the problematic interpretation of designations in musical scores and parts referring to high flutes—"petite flûte," "petite dessus de flûte," "flageolet," "flûte de tambourin" or merely "tambourin," "flauto piccolo," "flautino," etc. —cannot be adequately understood without an awareness of the special qualities and historical development of all the instruments.

Early in *Die kleinen Flötentypen* Meierott corrects a widespread error, drawing on a little-known study by Hermann Moeck: the flageolet with four front fingerholes and two rear thumbholes was probably *not* invented by the Sieur de Juvigny around 1581; rather the libretto of the *Ballet de la Royne* probably meant to say that the

god Pan, whom Juvigny represented, was the inventor of the instrument. Moreover the type of flageolet it refers to is probably the "flageolet à plusieurs tuyaux" (panpipes), not the simple flageolet. (Somewhat earlier Meierott mistakenly cites Machaut's *Remède de Fortune* as the source of two lines about pairs of "flajos" [p. 21]; the correct source is Machaut's *La Prise d'Alexandrie*.) Among other surprising facts related to the flageolet that emerge are the appearance in England of four different methods devoted to it before the appearance of the first recorder method (1679) and the publication in Paris alone of thirteen flageolet methods between 1800 and 1813.

Meierott's treatment of the development of the different types of instruments themselves is generally good, and he has drawn up important tables showing his own detailed measurements of a good many small flutes of various kinds. I am especially grateful for his attempts to distinguish more precisely between the fife, on the one hand, and the transverse flute and piccolo on the other. But he is not altogether consistent: on page 97 he suggests that all eighteenth-century fifes were cylindrically bored, while on pages 99–100 he mentions two "kleine Querpfeifen" dating from ca. 1700 that are weakly conical. He probably also ought to have considered longer fifes (one is illustrated in the *Encyclopédie*, and instruments that go as low as e^1 are extant—see p. 101) at greater length before deciding whether parts designating "fifre" were to be played at written pitch or at the octave above.

One minor correction regarding the first source the author cites that speaks about the existence of the one-keyed piccolo—Michel Corrette's *Méthode pour la flûte traversière*—is that this treatise was probably not published around 1735 but in 1740, as I demonstrate elsewhere in this *Journal* (Bowers, "New Light," n. 57). A larger concern is the author's suggestion that the piccolo probably entered the opera orchestra in France around 1735 and more or less supplanted the recorder in f^2 there by 1740 (pp. 174–175). I find his arguments about range not convincing since many of the post-1735 parts he includes could easily be played on the recorder in f^2, and their upward expansion probably represents an overall development in instrumental music of this period as much as anything

else. Secondly, I question his arguments based on key since all the high flute parts between 1700 and 1735 he mentions, naturally principally intended for a high recorder because of the later development of the piccolo, are nevertheless in the very keys said to be the "plus favorables" for the piccolo by Francoeur's *Diapason général* (cited on p. 106), whereas only the post-1735 parts include two in keys *not* among Francoeur's most favorable ones, and these (F and B♭) are in keys everyone deems more suitable for the recorder than for the flute. (The nicely documented change in designation from "flûte traversière" to simply "flûte" for the standard instrument around 1735–1740 is based on many more precise markings.) Of course the continued use of the imprecise designation "petite flûte" witnessed the gradual shift over to the predominant use of the piccolo that was complete by 1761 (see p. 105).

Several other alternative interpretations that I see in the material Meierott presents about the use of small flute types are: (1) The second "flautino" part in No. VI of Schütz's *Symphoniae sacrae I* has too many $c\sharp^2$'s for it to be playable on a recorder in c^2; a recorder in g^1 would work much better for that part. (2) The "zuffolo" parts in Keiser's *Croesus* are certainly playable on the fife as well as on the recorder in d^2. (3) Since in Mozart's "Kanarienvogel" trio (KV 600, no. 5) the "flauto piccolo" part exactly repeats what the "flauto" (transverse flute) plays before it, though it sounds an octave higher, the closer relationship of the piccolo to the flute than of the flageolet to the flute suggests to me that the former instrument is a more reasonable choice for this part. The eighteenth-century piccolo was considerably less shrill than most modern ones, too, and should not have been too loud for a trio calling for reduced forces, as Meierott suggests it would. (4) Since Meierott calls attention to a (albeit later) Tuerlinckx piccolo marked G with a lowest note of g^2 (p. 112), I would not rule out the possibility that such an instrument existed earlier and that Mozart could have had it in mind for the *Entführung aus dem Serail* part marked "flauto piccolo in G" (Meierott would assign it to the flageolet).

Nevertheless, the information drawn together about the use of little flute types forms an extremely important contribution to our knowledge of performance practice. The author makes crucial dis-

tinctions between the "fiffaro" and "piffaro" and demonstrates convincingly that Monteverdi's "flautino alla vigesima seconda" was a recorder with the lowest note of c^2, not c^3. He discusses the kinds of pieces in which a designation of only "petite flûte" or "tambourin" probably signified the galoubet. He wrestles with the problem of when a part was played at pitch and when above. He quite fascinatingly considers the kinds of dramatic and musical situations in which not only high flutes but also lower ones normally took part, and he also traces the development of orchestral writing for the higher instruments.

From a technical point of view, I find his method of describing nontransposing instruments with, for example, a lowest note (and basic scale) of D as being in C, and of describing a smaller instrument of the same type with a lowest note (and basic scale) of F as being in E♭, confusing. Merely giving the lowest pitch of the instrument or stating the relationship between its lowest note and that of the standard instrument of its type is not only clearer but also reflects the manner in which seventeenth- and eighteenth-century sources spoke of these instruments. I also object to the author's description of a part being notated, for example, in G when on the page it clearly appears to be in the key of A (p. 34); what he means is that the instrument itself could be considered to be in G since it transposes up a twelfth. Other difficulties arise for the reader from the organization of the plate material; in one instance I found myself having to flip back and forth between more than four different pages to follow the author's argument—the page on which he described several instruments, the end of the paragraph on the following page that gave the numbers of the plates illustrating these instruments (pp. 59–60), the plates themselves at the back of the book, and the list of plates that told which of the instruments was represented in a given plate. Some of the plates themselves are too small to be clear in what they illustrate (as in the case of the *Wellenprofil*), and some of the fingering charts do not clearly show the difference between open, closed, and half-closed holes (the fourth hole of Mersenne's fingering for $f\#^1$ on page 50 should be open, for example). Clearly these are problems that vex the reader needlessly.

Nevertheless *Die kleinen Flötentypen* is a successful book. It is not surprising that a work that brings together so many diverse kinds of material about matters that call for a good deal of speculation should have some weaknesses and suggest interpretations that differ from the author's. On balance I find it much more often sound and revealing than open to question, and the marvelous detail it contains provides its readers with about all the sources they need to come to their own conclusions, a situation that speaks well for the excellence of research and objectivity of the author. Not only because it stands unique in its field, but also because it is comprehensive and thoughtful, it will be indispensable for anyone interested in the small flute types, whether they be instrument specialists, instrument makers, musicologists dealing with the repertoire that calls for these instruments, or performers seeking to perform the same.

JANE BOWERS

Orpha Ochse. *The History of the Organ in the United States.* Bloomington: Indiana University Press, 1975. 494 pp. $22.50.

This book is invaluable to all students of the history of organ design. Not only is it comprehensive in scope, it is also overwhelmingly well documented. Written from a broadly informed historical perspective, it is organized in a manner that elucidated the cultural and economic contexts within which the construction and use of organs took place, from the beginnings of this country to the present.

It appropriately begins with a survey of what is known about the earliest instruments that appeared in what is now the United States: those built for the Spanish missions of the West. The almost total disappearance of numbers of small Spanish and Mexican organs which came to the Western missions before 1700 is properly lamented; this loss is also a comment on the "American" disregard for the past, an attitude only beginning to dissipate in the second half of the present century.

Documentation of organ history, especially of the recent past, is

notably difficult, both because the organ is a technically complicated instrument and because American journals dealing with the subject (the old *Diapason*, for instance) were by no means noted for discrimination, much less "scholarly objectivity." Separating fact from fancy is a formidable task, and Ochse is to be congratulated for her cautious citing of statements which often were based more on opinion or fad than on either fact or artistic integrity.

Impressive samples of painstaking inclusion of accurate data include her treatment of the earliest twentieth-century revivals of mechanical-action organ building (pp. 415ff.); the citing of early records describing the first organs at King's Chapel and Christ Church, Boston (pp. 20–26); and a discussion of the problems inherent in relating different styles of organ design to organ music (pp. 402–403) in the "Neo-Baroque Organ" chapter. The amount of information included about nineteenth-century builders is staggering.

We are, however, presented with a welter of conflicting opinions, from which experienced readers must draw their own conclusions. Ochse's book would be even more useful, in my opinion, had the author permitted herself a concluding, clearly personal evaluation of the various currents which have affected organ design, especially in the last fifty years. Such an "epilogue" would make the book more helpful to students and historians not versed in the technicalities of organ history. It would also inevitably mar the author's admirable attempt to present only documented information; but it would enhance our understanding of a complicated series of controversies by separating sense from nonsense. What would be helpful, in other words, is a brief and clear discussion of the nature of the instrument, seen from the perspective, however limiting, of its repertoire. Such a discussion should not shrink from singling out the masterpieces among recently built organs, and identifying the disasters (of which some are included).

A few observations about items which might bear scrutiny in the event of a second edition are: the organ in Mount Calvary Church, Baltimore, while well described, has had a more pivotal influence in recent history than Ochse recognizes; a photograph ought to be included, as well as some indication that this instrument was really

the first successful large organ made in the United States (1961) in the "classic" style. The quibbling about the importance of the 1933 Positif for the old Cleveland Museum organ by Walter Holtkamp (p. 387)—since it appeared before any similar attempt in its day—ought to be excised. (Ochse notes that an 1840 Firth and Pond instrument in St. John's Chapel, as well as other nineteenth-century instruments, had choir divisions on the gallery rail. Though true, this is confusing, since these examples are essentially unrelated to Holtkamp's "first" in this century.) Also the statement that facade reeds on Spanish organs "were integral members of the ensemble" (p. 397) is insupportable; the discussion which ensues, about the "spectacular" antiphonal reed stops of recent organs, leaves the impression that these extravagances have some musical importance, which in terms of the repertoire they do not.

Nevertheless, Ochse has produced a useful and extensive work which should have encyclopedic use for years to come. Its bibliography is excellent and its coverage of detail is generally first-rate and relevant. It should certainly be made available wherever there are students of organ-playing or of the history of organ design.

JOHN FESPERMAN

Robert E. Eliason. *Graves & Company: Musical Instrument Makers*. Dearborn, Michigan: Greenfield Village and Henry Ford Museum, 1975. 21 pp. $1.25.

Greenfield Village and Henry Ford Museum exist to preserve the American scene of earlier times and the products of its industry. It is not surprising, then, that Robert Eliason, curator of musical instruments, has devoted his recent research to the Graves Company, an outstanding and progressive New England manufacturer of wind instruments, whose products are well represented in the museum. Samuel Graves, along with certain members of his family and at times various other business partners, maintained the business mostly in Winchester, New Hampshire, during the second quarter of the nineteenth century and in Boston with somewhat

less success during the third quarter. In the Winchester years, Graves' woodwinds excelled, and the manufacture of noteworthy brasses emerged. The following two decades in Boston, devoted solely to the production of brasses, were less fruitful, less imaginative, and less successful.

The historical research for the creation of this publication involved the study of many pertinent records in New England and personal interviews with a genealogically-minded descendent. For musical sources, Eliason depended on a fine representation of Graves' production throughout the half-century of manufacture. The pamphlet includes information on the family, the firm, and the present ownership of extant instruments. The essay on the history of the enterprise is well illustrated and includes an evaluation of the place of Graves' instruments in relation to those of contemporaneous manufacture. Its value is enhanced by the relative neglect of coverage on instruments of American manufacture in the standard works on the subject. Eliason must be congratulated on another well-written, exemplary study, which provides much useful information to curators, collectors, and students of musical instruments.

ROBERT AUSTIN WARNER

E. A. K. Ridley. *Wind Instruments of European Art Music.* Foreword by David M. Boston. Photographs by Bernard Brandham. London: Inner London Educational Authority, 1974. 107 pp. plus 20 black-and-white plates. Available from Horniman Museum and Library, Forest Hills, London SE23 3PQ. 45p.

Walter Nef. *Alte Musikinstrumente in Basel / Instruments de musique anciens à Bâle / Ancient Musical Instruments in Basle.* Photographs by Peter Heman. Basle: Stiftung für das Historische Museum Basel, 1974. 47 unnumbered pp., incl. 20 plates, 15 in color. No price given.

Ridley's handbook to the Horniman Museum's collections of wind instruments concerns itself with "wind instruments proper" according to the Hornbostel-Sachs classification and thus includes

pipe organs but not reed organs, in which there is no enclosed body of vibrating air. Bagpipes are also excluded "for reasons purely of convenience": there are none in the Adam Carse Collection, and since they range from sophisticated instruments of art music to simple folk types, it is difficult to determine where to draw the line with them. Aside from these cases, the author has avoided problems related to schemes of classification and has aimed at "accuracy and intelligibility." This small volume presents a concise and knowledgeable account of the nature and types of European wind instruments, an excellent discussion in nontechnical terms of their acoustic principles, a good general history of wind instruments, and detailed information on various particular types. A complete listing of the Adam Carse Collection, donated to the Horniman Museum in 1947, is arranged in chronological order of acquisition, and this is followed by a catalogue of all European wind instruments now in the museum, listed systematically by category, with dimensions, catalogue number, and information as to whether they are in the Bull Collection, the Adam Carse Collection, or the General Collection. The twenty black-and-white plates include a judicious selection of ninety-two representative instruments from all types except organs. Finally the author provides a useful list of books for further reading and an index.

Nineteen seventy-eight will mark the centennial of the opening of the exhibit of musical instruments in the Historical Museum at Basle, Switzerland, so the appearance of *Ancient Musical Instruments in Basle* with trilingual text is especially timely. Six of some forty instruments originally on display in 1878 are portrayed in the fine full-page plates, together with twenty-seven others from the collection which now numbers eight hundred. A foreword, giving a brief history of the collection, is followed by twenty plates, fifteen in handsome color, placed opposite short descriptive essays in German, with abridged versions in French and English. Instruments illustrated include a Basle drum dated 1571, two trumpets by Jacob Steiger dated 1578, a sixteenth-century Swiss organ, a fiddle, a rebec and kit, two cornetts and serpent, a chitarra battente by Giorgio Sellas (1641), sopranino and alto recorders by J. C. Denner, a viola da gamba by Joachim Tielke, three horns, clavichord,

organ, hurdy-gurdy, oboe, oboe d'amore and tenor oboe, an elegant spinet by J. H. Silbermann, pedal harp, two jew's harps and cases, a "jingling Johnny," four flutes (one a rare instrument with two keys), and a Stein fortepiano. A minor flaw which the sharp-eyed reader may notice is that the photograph of the four flutes was reversed—making them appear to be designed for left-handed players.

DALE HIGBEE

Don E. Teeter. *The Acoustic Guitar: Adjustment, Care, Maintenance and Repair.* Norman: University of Oklahoma Press, 1975. 200 pp. $20.00.

Don Teeter has written a truly remarkable book. It is unusually complete and gives detailed instructions on most phases of guitar repair and refinishing as well as describing the tools, jigs, and fixtures that can be made to facilitate the work. It is lavishly illustrated with excellent photographs and sketches. The style is breezy and not stilted. By the time you have finished the book you will feel that you know Don personally. After having read many books on guitar construction and repair, some of which were misleading and even erroneous, I approached Teeter's book with some skepticism. I found to my surprise that it is correct in the largest degree. Many things are brought out in it that desperately needed saying and had never been written before. It also includes a fine exploded view of a guitar, and it explains the sound production of the acoustic guitar, though I do not agree with Teeter's assessment of the difference between a classic and a flamenco guitar.

The chapter on tooling—slanted towards the use of most modern power tools, a true economic necessity for today's repair shop —is complete and well written. The device for drawing up the patches from the inside to repair cracks is excellent. It has evolved from a simple dowel with a hone in it to several versions of the one shown in the book. Among specialty tools, however, the fret miter box could be improved by making the upper part of the slot fit the saw blade closely and providing relief at the bottom for the set of the saw teeth, the saw entering from the side. And the strut jack,

while versatile, is rather like killing a gnat with a sledge hammer; old-timers simply used a small wooden prop cut to the exact length for each job. The description of the specially bent chisel blade for removing bridge plates is fine, but one step is omitted: the tool must be heated cherry red and quenched, not let cool gradually. It should then be reheated to draw it (I would prefer a blue color) and quenched again. Concerning the bending iron for forming guitar sides, the heat could be more easily controlled if an electric element were used instead of a gas burner. It would also be more advantageous to form the tube in an oval shape and to set it up vertically; nevertheless, the iron shown will work very well. The instructions for the use of the Dremel tool are worthwhile and fully detailed. For removing bridges, I prefer a wide wood chisel rather than the reworked putty knife, but this is just personal preference. The flush-ground end cutters are great for removing frets. They can also be used to cut fret wire, leaving a square-ended cut.

Teeter's remarks on wood selection and storage and on the handling of purfling installation are right on the mark. Of great importance in guitar work is the selection of the best glue for a given application, and Teeter covers this well and thoroughly. His syringe for glue injection will be of value to repairmen working inside instrument bodies. The handling of crack repairs as well as of disassembly and reassembly is also well explained, though I am a little dubious of the practice of cutting through the fret board at the location where the neck joins the body, except on a steel stringer when the truss rod goes through the neck block inside. The description of the guide on the Dremel tool for rabbetting the guitar body is a fine approach to the preparation for installing the bindings and purfling. In this connection, the use of painter's masking tape makes the job easier, just as Teeter says.

In the thorough and well-written chapter on string adjustment and truss rods, Teeter tells how to adjust the strings so as to make the fingering as effortless and rapid as possible. His information on refretting and neck reinforcements is original and very good. In dealing with intonation and bridge placement, Teeter outlines the various steps that must be taken so that each string sounds correct notes when fingered in each fret position. Particularly difficult on steel-stringed instruments, this problem has bedeviled instrument

makers since early times. I was gratified to note that Teeter exposes the fallacy of compensating for fingered string tension by shortening the first fret spacing. This was first advocated in a book by A. P. Sharpe, and I have seen otherwise excellent guitars spoiled by using this approach. Another direct hit by Teeter is his suggestion for improving certain steel-string guitars by replacing a "tie on" bridge with a pin bridge; the vibration is thus transmitted directly to the spruce top rather than being filtered through the wood of the bridge. On a nylon-strung guitar, however, it is preferable to have this filtering effect, so the classic bridge is better. I was surprised to note that Teeter uses a factor of 17.8170'' to calculate fret layout, since most authorities consider 17.835'' to be correct. Teeter's figure is the result of a computer calculation and is said to be .010'' more nearly accurate at the twelfth fret than the older figure.

The chapters on doing pearl inlay and on finishing and refinishing are excellent. In the latter the emphasis is on modern lacquers and spray techniques. French polishing is not dealt with. I am a little skeptical of Teeter's advice about using thinned epoxy as a sealer, but I have never tried it. Teeter is of the opinion that it is bad practice to mix different types of finish on the same instrument. Old-time wood finishers usually used shellac as a sealer and varnish for finish coats with the resulting "alligatoring" to be seen on most old furniture. Modern fillers, sanding sealers, and spray lacquers, if well used and not too thickly applied, make a beautiful and durable finish without killing the tone.

To sum up, I was very favorably impressed by Teeter's book and am glad to have a copy in my library for future reference. The few things I have discussed are just a small sampling of the wealth of information it contains.

H. E. Hutting II

Review Editor's note: Hideo Kamimoto's *Complete Guitar Repair* (New York: Oak Publications, 1975; 160 pp.) arrived too late for Mr. Hutting to compare it to the Teeter book in the above review. He writes, however, that the Kamimoto book is very thorough, well written, and a bargain at $6.95.