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graphs of a sixteenth-century chitarrone and an unusual English pagoda clock, ca. 1780, which contains a miniature spring-driven pipe organ. Lacking other instruments in their holdings, the Toledo Museum authors use twenty-four examples of visual art featuring various string, woodwind, brass, percussion, and keyboard instruments. Their commentary is generally informed, except for the description of the range of a tabor pipe as being "about five notes" and the labeling of the Italian octavina as a virginal rather than a spinet. This booklet should help increase readers' awareness of musical instruments portrayed in paintings.

DALE HIGBEE

Ian McCombie. *The Piano Handbook*. New York: Charles Scribner's Sons, 1980. 176 pp.; 32 black-and-white plates. \$12.50.

Ian McCombie's *Piano Handbook* is a broad survey of a little-known craft, piano technology—half science, half art, partly modern, partly centuries old. Concerned with the nature and workings of the piano as they pertain to maintenance, tuning, and repair, the *Handbook* is primarily designed for the musician and the amateur piano tuner, although the author does not state so directly. It should be made clear that this volume is entirely elementary and basic in its technique and purpose.

The work, divided into two sections, "Basic Piano Information" and "Piano Tuning and Repair," offers seventeen fact-filled chapters which outline the fundamentals of the piano and piano servicing. Photographs and exploded-view diagrams facilitate the reader's understanding of the function of the instrument and the procedures being described.

An introductory overview presents a brief history of the piano's origins and proceeds through the developments of iron framing and improved methods of making music wire that led to the evolution of the modern piano.

The following three chapters are by far the most immediately useful and informative to both the musician and the amateur piano

tuner: they are concerned with buying a piano, judging its tone, and maintaining a new instrument. Six rules are given for the purchase of a piano, old or new. All the points discussed are well founded and sound, and there is no evidence of prejudice either for or against a particular brand name or model of instrument on the part of the author. Comparisons of the general dimensions of both upright and grand models are given in both inches and centimeters.

Included in the chapter on buying a piano are rather detailed guidelines for appraising a used instrument. Here, the lay reader may first begin to stumble as technical and physical characteristics of the piano are outlined before specific nomenclature has been introduced and defined. There are no diagrams or plates in this chapter, and a reader new to the field will need to flip to the glossary or search out a diagram in another chapter. However confusing these guidelines may be to the uninitiated, the information is again excellent.

Judging piano tone can be a very personal process, but this too has its rules. Various aspects of tone quality are explained, such as the relationship of a string's length to the thickness and tension required for a given pitch, hammer density, and the effects of location and environment on tone. Though the author describes his own concept of tone quality, he nevertheless provides readers with a greater understanding of what they are hearing and what they should listen for.

The fifth chapter, "The Upright Action," finally gives diagrams and descriptions of the function of the piano's action. The actions described, however, are typical of foreign makers, and the common American upright action is not represented. Although accurate, some of the explanations are confusing because of awkward wording. A list of steps for adjusting the action for proper and efficient operation is given, but specific instructions for making the adjustments are not provided. This applies to the chapter concerned with grand piano action as well, although here both foreign and American designs are represented. No brands—popular though they may be—that require specialized servicing are mentioned. Indeed, throughout the entire book, no specific attention is paid to any particular brand of instrument.

The second section of *The Piano Handbook*, "Piano Tuning and Repair," is intended for use as a textbook; the author refers to the

reader as "student," and the bulk of the text is written on a fairly advanced technical level. The first part of this section is concerned with the basic equipment and tools required for tuning, what to listen for, and the step-by-step procedures and methods for tuning a keyboard instrument. The equal temperament described—an F temperament—and the tuning techniques outlined are standard and are commonly used by professional tuner-technicians.

The final chapters of the book cover the overhauling of a piano in a workshop, including hammer and key repairs, restringing, cleaning, soundboard and bridge repairs, voicing, and upright and grand action regulation. Again it must be stated that the information is basic and the work is a general survey. In the chapters dealing with repair, the format is not that of symptom/diagnosis/treatment, as might be expected; rather, the author deals primarily with treatment. Many of the repair procedures discussed are basic, but there are several that are more advanced than those usually covered in books of an introductory nature. The advanced repairs are presented without words of caution, and there are numerous instances in which giving a little more detail (such as specifying which type of glue to use rather than merely stating "glue") would make all the difference in the quality and success of a repair attempted by an amateur. Generally the information is accurate, however, and no particularly controversial methods are described, even if details are lacking. The same is true of the chapters dealing with upright and grand action regulation as well as the final chapter on the reconditioning of player pianos.

Following the main body of the text, a detailed and useful glossary appears. The first of three appendices lists piano manufacturers that are owned by other companies and grades selected firms for excellence. The second specifies the diameters of music wire and pin sizes used in pianos, and the third consists of metric conversion tables. The concluding index is well organized and quite thorough.

Though *The Piano Handbook* does not seek to break fresh ground in the field of piano technology, the author takes his work seriously and presents information in short, concise paragraphs. One drawback is that the book does not read smoothly and occasionally lacks continuity; it also contains little in the way of wit or humor. Still, the book is, for the most part, interesting and informative. Though it is

aimed at the musician and amateur piano tuner, this is not to say that a specialist would not benefit from it. But most of all it will serve well as an introduction to the skills required of piano tuner-technicians and as an avenue for musicians' understanding of the machine they control with their fingertips.

ANDRIS K. CHAPIN

Owen Jorgensen. *The Equal-beating Temperaments: A Handbook for Tuning Harpsichords and Forte-Pianos, with Tuning Techniques and Tables of Fifteen Historical Temperaments*. Raleigh, N.C.: The Sunbury Press, 1981. 36 pp. \$4.50 (paperback).

Herbert Anton Kellner. *The Tuning of My Harpsichord*. Schriftenreihe Das Musikinstrument, vol. 18. Frankfurt am Main: Verlag Das Musikinstrument, 1980. 54 pp. DM22 (paperback).

It must be admitted at the outset by the reviewer that he expressed publicly the wish that expert piano tuner and authority on historical tunings Owen Jorgensen write a brief practical method on the historical keyboard tunings, based on his voluminous *Tuning the Historical Temperaments by Ear* (Marquette: The Northern Michigan University Press, 1977). This Jorgensen has now done in *The Equal-beating Temperaments*; but how regrettable that, aside from the excellent section on tuning techniques, which all early keyboardists should consult, the result cannot be recommended, least of all to the novice tuner. With the exception noted, the booklet is little more than a curiosity, mingling as it does so much misinformation and confusion with genuine information, and providing no way of distinguishing between them.

Jorgensen's thesis is that musicians of old tuned keyboard instruments by the equal-beating method, which is the determination of the pitch of a given note within a desired temperament by equalizing the beats of two specific intervals, both of which include the note in question. This method offers a very precise tuning tool that can aid in