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whole), but as an aggregate of separable elements which, as such, can survive the loss of a number of them. Thus Hicken does not believe that the disappearance, from Opus 19, of cadential functions necessarily undermines the work's harmonic integrity, nor does he even mention, at any point, the organization of metric and rhythmic stresses which, in traditional tonal music, are essential in supporting and articulating the harmony, and which may now, in Schoenberg's music, be absent or much changed. In sum, the case made in the book for a coherent harmonic structure leaves too much out of account to be entirely convincing, were it to have to stand up against the more modest claim that traditional harmony remains in Opus 19 as a significant trace, but no longer functions as an agent that, in itself, determines the form.

Such problems aside, the book is a valuable one in showing to what extent Schoenberg's musical background was still operative, willy-nilly, at some level of his creative consciousness, and in suggesting sensible ways of testing the new against the old. What the reader will not find anywhere is a sense of the music's subversiveness, or any indication of the questions over which the composer must have agonized as he groped his way, just before World War I, beyond the security of established formulas.

Alan Lessem

THE CHROMA FOUNDATION. *Chromatic Notation: The Results and Conclusions of the International Enquiry*. Victoria, B.C.: Edition Chroma, 1983, 47 pp.

The need for notational reform has impressed itself on composers, performers, and theoreticians with increasing urgency in this century as new methods of musical organization and attendant personal notation systems proliferate and challenge the assumptions that underly our traditional system. In an effort to bring some order to this calligraphic chaos and to evaluate the many contributions to the field, with the goal of creating a new notation for today's music that will exist side by side with the traditional system, the Chroma Foundation in 1979 organized an international enquiry into the notation situation. After receiving "more than 100 notation proposals, of which quite a few have been in use for decades by teachers and composers" (p. 4), the Foundation has now published its findings in order "to bring the problems of music notation a step closer to solution" and to place "[its] efforts at the disposal of an international discussion". (ibid.). In this slender volume, however, one is more often aware of an evasion of important issues and is little inspired to believe that a new system is at all closer to anything approaching universal acceptance.

The authors have presented the results of their enquiry in three sections. The first presents thirty-one selected proposals (with, annoyingly, no more historical information than the inventors' names and the places of first publication), displayed in a uniform format that indicates for each the notation of a chromatic scale (C-B), the two whole-tone scales, and four-bar passage from Bach (mm. 63-67 of *Contrapunctus III* from *The Art of Fugue*). The choice of the Bach excerpt is curious, for Chroma's avowed aim is not to replace the traditional diatonic system, but to devise a co-existent system, each accommodating the musical language for which it was designed. Although the excerpt in question contains some chromatic voice-leading, it is rooted in a diatonic conception of musical organization for which the notation of the traditional system is perfectly adequate. A more appropriate choice would have been a passage from Schoenberg or Boulez, whose notation more readily reflects the inadequacies of a diatonic-biased system when used for atonal music, and whose transcription into various new systems would highlight their advantages.

The authors imposed the criterion that all selected proposals should represent pitch in a graphic manner, with equality of intervals (mistakenly called "equality of pitches"), that is to say, with a visual identity of all half steps obtaining throughout the octave; a half step, then, is always from a line to a space or from a space to a line. Hence, "whole tone" notations, in which two (or more) differently shaped or colored symbols on the same line or space stand for adjacent pitches, are only cursorily mentioned, evaluated, and dismissed. Similarly, many instrumental and symbolic notations, as well as several that simply modified the traditional system or addressed other musical parameters, such as expression, articulation, and dynamics, were completely excluded. This is to be regretted, since, although these latter may not have contributed much to the search for a practical universal new notation, they would certainly have added variety and interest to the selected list of rather tediously similar proposals.

The twenty-three "chromatic" notations (or "graphic representations of half steps") that are presented, as well as the eight "whole tone" notations, are then evaluated in chart form for ten qualities, including general clearness, identity (or "periodicity") of the octave, equality of intervals, durational system, "writeability," legibility, microtonal expandability, and economy of space. The authors state that "in this evaluation the practical usefulness of every notation has been tested. Whenever the answer is positive, it is marked with an X" (p. 5). The exact form that this practical testing took is never made clear—who tested the systems: professional musicians fluent in traditional notation or beginners with no experience in any notational system, teachers or students, performers or analysts? And what would constitute a "positive answer"? The evaluation chart indicates an X for such a result and a blank box for a (presumably) "negative answer," but,

surely, most of the systems cannot be easily classed as, say, "legible" (marked with an X) or "illegible" (blank). A sliding scale from 1 to 10 would perhaps have better brought to light the relative strengths and weaknesses of each proposal. As it is, these problems in the evaluation procedure produce some puzzling results. For example, the six-line staff of one proposal (No. 8) is deemed difficult to write, while a seven-line staff involving a dashed line (No. 9) and another six-line staff involving two dashed lines (No. 14) are "writeable." Proposals Nos. 12-14, involving four four- to six-line staves in continuous score are rated as taking up less space than a two-stave piano score in traditional notation. And, while most of the new systems are judged to be expandable to accommodate microtones, the traditional system is not—yet the proposals put forward later (p. 39) for a microtone notation would involve, in either "chromatic" or traditional notation, an addition of symbols (i.e., accidentals) or a modification of note heads, either of which would violate the authors' criterion of unique graphic representation for each pitch. In such a system, microtones would appear to be simply accretions to a basic twelve-note chromatic scale, just as the chromatic pitches appear in the diatonic-biased traditional system. Any of the proposals presented will fall prey to this problem and, thus, all are equally expandable or not expandable, depending on the notator's desire for unique graphic pitch representation.

The second section, based, presumably, on the evaluation of the proposed systems, deals with an investigation of what the authors' new notation should consist. For the most part it is cogently reasoned and the results, Chromatic Notations A and B, seem to be flexible, clear, and suitably neutral for practical application. Both the latter, on a four-line staff with two ledger lines per octave, and the former, on a three-line staff with two ledger lines on either side of a fourth single line per octave, use alternating lines and spaces to accommodate twelve chromatic pitches, are "octave periodic," contain space between staves for expression marks, and are equally adaptable to divided or continuous score format. The durational system suggested, after a cursory examination of some of the shortcomings of proportional and beamed notation, is a combination of the traditional durational symbols with proportional time-scaling, thereby giving a perfect graphical representation of duration to correspond to that of the pitches, without the introduction of unnecessary new complications. Although this may be the most expedient solution, it still leaves unanswered the question of a more elegant notation for "irrational" subdivisions and rhythmic superimpositions than currently is possible in the traditional system.

While most of the above suggestions are based on sound thinking, some further proposals are a little less so. The silliest is one to replace the whole rest by a double half rest to avoid confusion about which hangs from and which rests upon the line—there may be some initial confusion for beginning notators, as the authors suggest, but there is

no confusion in performance where the context clearly differentiates the two. (The authors' own confusion may be indicated by the fact that they place these rests between the second and third rather than the third and fourth lines in traditional notation!)

The proposals to number the pitches 1 to 12 (C to B) or to invent a new solfeggio nomenclature (do ga ré pa mi fa ké so vi la bé ti) seem at first to be sensible, but each has its dangers, either in confusing the numbering system with those currently in use for pitch-set analysis, or in reconciling the fixed-doh system implied by the new system to a movable-doh system of solfeggio for tonal music.

Finally, contrary to the authors' assertions, some music, especially polyphonic music, in the continuous score format will pose considerable problems for the keyboard player when hands and voices continually cross. In traditional piano score format these problems are ameliorated by the use of separate stave for each hand; the solution suggested in the new notation, "a thin pencil line drawn between the voices of the right and left hand" (p. 38), seems ingenuously inadequate.

The last section of the work presents two extended re-notations (of the complete Bach *Contrapunctus III* and of Debussy's *Danseuses de Delphes*) in both Chromatic Notation A and B. The second, with the four-line staff, seems to be the clearer and easier to learn—the "floating" fourth line in the first gives the score a cluttered look and seems to make the octave divisions a bit more difficult to apprehend.

Of the two pieces transcribed, it is the Debussy that benefits the more—the structure of the parallel chords is much more obvious and the voice-leading suffers not a bit. By contrast, the Bach loses some of its comprehensibility in transcription—the diatonic bias of the traditional notation makes not only the harmonic structure and the voice-leading, but also the motivic relations, clear, and most of this is obscured in the new version. For example, the prominent upper/lower neighbor-tone motive, which always involves adjacent lines and spaces in the original (see mm. 33-36 and 61-65), takes no fewer than six different forms—depending on the arrangement of half and whole steps—in the transcription, a disconcerting feature, certainly, in Bach!

The work of the Chroma Foundation has obviously been extensive and they are to be commended on this addition to the ongoing discussion of notational problems. One would have hoped for a more perceptive critical appraisal of some of the issues, a more precisely defined evaluation methodology, and a more comprehensive look at new notations for parameters other than pitch and duration, but within their narrow terms of reference the authors have made some valuable suggestions. Although one suspects that the fragmentation of the current compositional spectrum and the sheer enormity of the task of achieving universal acceptance will continue to frustrate implementation of any one new system, the research by the Chroma Foundation will continue in pursuit of this elusive goal.