

## Introduction

By and extraordinary chronological coincidence, Messiaen's extensive (and extraordinary) foray into the world of serialism took place in 1951, the year of Schoenberg's death and the publication of Boulez's infamous article, "Schönberg est mort." Thus, Messiaen's *Livre d'orgue* enters the musical arena of serial music at a crucial time.

## Example 1

Example 1 is the score of the first section of "Reprises par interversion," complete with special instructions for the organist, such as the registration for the R and Pos manuals. In addition, he has labelled the Hindu rhythmic patterns, each of which occupies one bar: *pratapaçekhara*, *gajajhampa*, and *sàrasa*. Of these the *pratapaçekhara* and *gajajhampa* each consist of three durations, while *sàrasa* contains six. The succession of three patterns, which Messiaen calls the trio, undergoes the six possible permutations over the span of the 18 bars of Section 1 of the work (Example 1), the music that forms the basis of the reprises in Sections 2, 3, and 4.

## Overall Form of *Livre d'orgue* I, "Reprises par interversion"

Messiaen describes the form of the first piece of his *Livre d'orgue* as follows:

The piece is divided into four sections. Sections 2, 3, and 4 are just repetitions (reprises) of the first, but according to certain forms of interversion, or permutation, I chose the simplest forms [of permutation], those most immediately grasped and understood: from the outer [notes] to the center [note], from the center [note] to the outer [notes], and the retrograde motion. [Original text in footnotes]

Messiaen also comments on the ordering processes in the first section, as well as in those that follow:

Whatever may be their [the pitches] order of succession (because of the interversions [permutations] to which that order is subjected), and

whatever may be the variations in duration (because of their treatment as rhythmic personages), at each presentation of the trio, to each grouping of the three rhythms, there corresponds an unfolding of the total chromatic (12 sounds). This unfolding is never in the same order. The music being monodic, a single large-scale voice encompasses all the registers, a serial unfolding would have been tedious, the changes of direction and the strict transpositions would not have saved [the music] from boredom . . . [his ellipses]. Preferable to the series, the total chromatic, always different, brings about fantasy, diversion, the unforeseen. It was practical for the large interversions of Sections 2 and 3: outer to center, center to outer, which would have been completely disrupted in a serial organization.

Livre d'orgue I: Reprises par interversion

I. Background material: Messiaen's discussion in TROC

TROC Tome III, Chapitre II, Analyse du Livre d'orgue: Sept pièces pour orgue (1951)

Deals first with rhythms and form and permutations of the three Hindu rhythmic patterns, then with organ registration as it relates to the Hindu names of the patterns. On p. 180 the "Remarque" is a brief discourse on the retrograde, with reference to Webern, Berg, and others.

p. 175: La pièce se divise en 4 sections. Les sections 2,3,4, ne sont que des reprises de la 1re, mais selon certaines forms d'interversion ou permutation. J'ai fait choix des formes les plus simples, les plus immédiatement appréciables, à savoir: extrêmes au centre, centre aux extrêmes, mouvement rétrograde. Voyons d'abord la 1re section, c'est-à-dire la musique normale, droite, dans son état original.

Quel que soit leur ordre de succession (par suite des interversions que cet ordre subit), quelles que soient leurs variations de durées (par suite de leur traitement en personnages rythmiques), à chaque présentation du Trio, à chaque ensemble des 3 rythmes . . . correspond un déroulement du total chromatique (12 sons). Ce déroulement n'est jamais dans le même ordre. La musique étant monodique, une seule grande voix embrassant tous les registres, un déroulement sériel eût été fastidieux, les changements de sens et les transpositions de rigueur ne l'eussent pas sauvé de l'ennui . . . [Messiaen's ellipses] Préférable à la série, le total chromatique toujours différent, apportait fantaisie, diversion, imprévu. Il était pratique pour les grandes interversions des Sections 2 et 3: extrêmes au centre, centre aux extrêmes, qui auraient tout bouleversé dans une organisation sérielle.

Translation: Whatever <sup>numbers</sup> their order of succession (because of the interversions that that order undergoes), whatever <sup>numbers</sup> their variations in duration (because of their treatment as rhythmic personages), to each presentation of the trio [of three rhythmic patterns] to each group of three rhythms, there corresponds an unfolding of the total chromatic (12 pitches). This unfolding is never in the same order. The

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music being monodic, a single large voice embracing all the registers, a serial unfolding would have been tedious, the changes in direction and the rigorous transpositions would not have saved [the music] from boredom . . . . [Messiaen's ellipses] Preferable to the series, the total chromatic, always different, brought fantasy, diversion, the unexpected. It was practical for the large interventions of Sections 2 and 3: extremes to the center, center to the extremes, which would be completely disrupted in a serial organization.

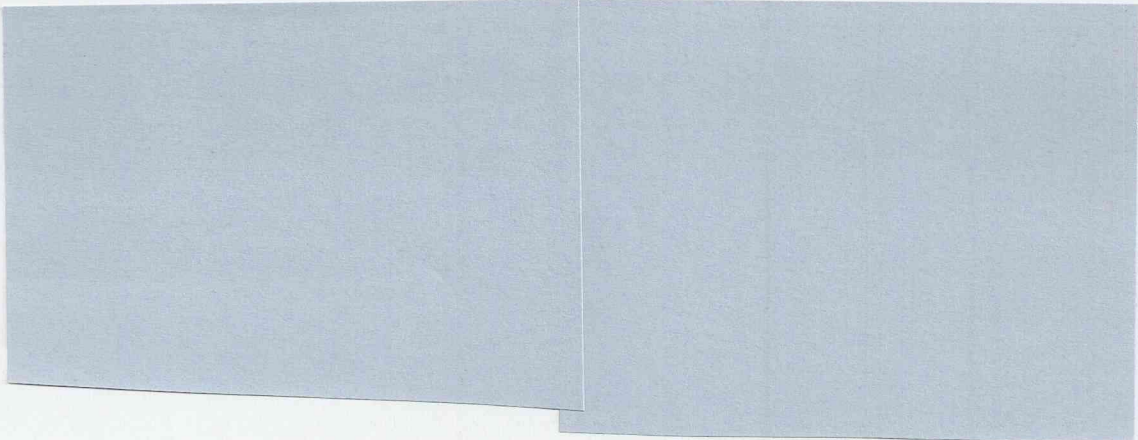
Comments:

By "serial organization" and "series" Messiaen apparently refers here to the four 'classic' order transformations prime, inversion, retrograde, and retrograde inversion. Reflecting the "experimental" nature of the work as a whole, it is interesting that this first piece is the most radical of the seven with respect to the ordering of the chromatic. Messiaen resists adopting the procedures of the Second Viennese School and those of the current serialists. Note also his characteristic fear of ennui. In subsequent parts of this article we shall see what the musical consequences of this informal statement of aesthetic guidelines actually are.

p. 179

Then discusses adjusting the 13 durations of the three rhythms to the 12 notes of the chromatic. Solution: to repeat one of the pitches in the interior of each unfolding (since the patterns are inviolable, fixed).

Pitch-Rhythm (p. 179): Dans la section I (N.B.): chaque rythme avait son timbre propre: chaque durée était affectée d'un son particulier provenant des différents déroulements du total chromatique . . . Then emotes upon the effect of the pitch reorderings upon the rhythmic personages: a "déchiquetage" (shredding, violent disruption, etc.).



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[Original in notes]

From this it is clear that Messiaen rejected the standard permutations of 12-tone music, inversion, retrograde inversion, and retrograde, although Section 4 of "Reprises par interversion" consists of a strict retrograde of Section 1, mention of which is omitted from his description of interversions in the foregoing passage.

#### Example 2

For pitch-analytical purposes, Example 2 simplifies the complex full notation of Example 1, reducing it to a single register and omitting duration as well as marks of articulation, dynamics, and other symbols. The order numbers of the original row, bars 1-3, are preserved in the permutations that follow, so that B on the third line always corresponds to zero, Eb on the top space always bears order number 7, and so on, stressing the dramatic and seemingly arbitrary nature of the "interversions" on lines 2 through 6 of Example 2, for which Messiaen does not offer an interpretation in the *Traité*.

The "serial" organization of the row on line 1 of Example 2 is, however, transparent, consisting of the directed intervallic succession in semitones +1 -2 +3 -4, etc., which produces a contoured inversional patterning. Identification of the disjunct hexachords of this row, not a difficult task, yields the label 6-1, the unordered "chromatic" hexachord often found in the 12-tone music of Anton Webern, but a musical object that has quite different consequences in the hands of Olivier Messiaen, as we shall see. [Note on 6-1 in Webern]

The reader will also perceive pitch-class relations between segments of the original row (bar 1) and segments of the permuted forms. For example, the first trichord in the bar 7 form (Bb-C-B) retrogrades the first trichord in the bar 1 form (B-C-Bb), and the second trichord in the bar 7 form (F-E-F#) inverts and transposes the first trichord in the bar 1 form.

#### Example 3

Before examining the row and its permutations more

systematically for pitch-class replications and other transformations, however, I would like to consider the order relations between the original row (bar 1) and each of its permutations. The successive forms were shown, without analytical interpretation, in Example 2. Example 3 offers an interpretation in terms of cyclic notation, which affords a way of assessing the degree of rearrangement a permutation B effects upon the elements (pitches) of a basic ordering A. The cyclic notation below the bar 4 permutation of the bar 1 (original) form of the row will illustrate. The numbers in the first cell, circumscribed by left and right parentheses, are read as follows: the element (pitchclass integer) in position 7 of the original row (the bar 1 row) moves to position 8 in the bar 4 permutation, while the element in position of the original row moves to position 4 of the bar 4 permutation. Finally, the element in position 4 of the original row moves to position 7 in the bar 4 permutation, completing the cycle of three order positions. Beginning, arbitrarily, with any other order number not in the completed cycle, it can easily be ascertained that the permutational relation between the bar 1 and the bar 4 forms of the row is completely described by the three cycles, called cells, (784) (91110) (023561). [Note on nonuniqueness of a cyclic representation--as long as the cell's adjacencies show the mappings.]

Example 3a

Unlike the "traditional" permutations of classic 12-tone music (transposition, inversion, retrograde, and retrograde inversion), which form very regular patterns in cyclic notation, Messiaen's permutations here (Example 3) are not only "irregular," but also differ considerably from one another, especially in their cellular configurations, which exhibit no duplications. These configurations are summarized in Example 3a, in terms of the number of order position numbers in each cell.

Further study of these cyclic patterns provides insights

into Messiaen's permutational personage. The first of these (Example 3a), 3 + 3 + 6 replicates the pitch-grouping of the "trio" in Section 1 of "Reprises par interversion." The second, and third contain unary cycles, cycles in which a single element retains its position, while the fourth contains 2 of these, holding pitch classes G and F# in fixed positions. Each configuration contains one large cycle,

indicative of a substantial reordering, and this pattern culminates in the final configuration, involving the original bar 1 row and its permutation in bar 16, in which, as the cyclic notation shows, no element of the original retains its position in the permutation!

What these patterns reflect, obviously, is a successive and

varied shifting of the pitches of the row. In a number of cases adjacencies are preserved through swapping, as in the last cell of the permutational pair bar 1 and bar 13:

(013211), guaranteeing an invariant "unordered" pentad between the two forms. As we shall see, however, correspondences of greater musical significance appear when the pitch-class succession undergoes analytical parsing.

### Conclusion

Return to Messiaen's statements about the aesthetic rationale of the permutations of Section 1. Not random, which might have been the ultimate solution.

Among the many questions that might be raised concerning the position of this serial music in Messiaen's oeuvre, perhaps the most important concerns its manifestation in his later music. See Shirlaw at end of discussion of Mode de valeurs et d'intensités.

The rest of Livre d'orgue?