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### III. *L'Échange*: pedal sonorities vs. complete rotations

#### Abstract

Olivier Messiaen (1908 – 1992) is acknowledged by the international music community as one of the most influential French composition teachers of the twentieth century. His composition methods, selections of pitch material, modes and scales of birdsongs, contrapuntal treatment and rhythmic formations are subject to analysis and study by composers and scholars. Messiaen's *Vingt Regards sur l'Enfant-Jésus* for piano (1944) -a collection of twenty pieces- is considered a major work for its masterful composition, theological symbolism, and exploration of new aesthetics. The sonorous collection holds a significant place in the twentieth century piano literature. In *L'Échange*, which is the third piece of the cycle, the minimal use of rhythmic and pitch material projects a rather static surface -‘pedal sonorities,’ ensuring the coherence; furthermore, the continuity and flux is assured by the incessant evolution -‘complete rotations’ of additional musical elements that constitute the theme. The analysis here will examine all parameters that support the coherence and continuity of the form taking into account the variation in pitch and rhythmic material, in order to understand the compositional process and techniques.

#### Introduction

*Vingt Regards* cycle celebrates the Child-Jesus.<sup>1</sup> The religious collection is based on symbolic-cyclic themes that appear in most of the movements.<sup>2</sup>

THÈME DE DIEU      THEME OF GOD

THÈME DE L'ÉTOILE ET DE LA CROIX      THEME OF THE STAR AND THE CROSS

THÈME D'ACCORDS      THEME IN CHORDS

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<sup>1</sup> See full catalogue of titles in Appendix 1

<sup>2</sup> The themes are: ‘Theme of God,’ ‘Theme of Star and the Cross,’ ‘Theme of Chords,’ and ‘Theme of Love.’ (Green, 2007:5)

In addition to the cyclic themes and to several other compositional techniques,<sup>3</sup> the composer explores the ‘Modes of Limited Transposition,’ his complex rhythms borrowed from the ancient Greek and Hindu musical cultures,<sup>4</sup> the scales of birdsongs from Messiaen’s ornithological studies, the symbolic use of specific intervals, tone centricities and tonalities, and the “concept of ‘color’ in music.”<sup>5</sup>

*Regards* were crafted for Yvonne Loriod’s superb technique. Pianist and scholar Coady Green argues: “... *the music is phenomenally difficult to play, and.... at the time Loriod premiered the Regards..., it was considered the most difficult music ever written [for piano].*” (Green, 2007: 3)

### Analysis and Commentary

In *L’Echange*, Messiaen introduces the theme -as he refers to- ‘the terrible commerce’ between God and mankind.<sup>6</sup> The theme is comprised of four elements (or motives **a**, **b**, **c**, **d**) in the space of two measures. Due to the resulted balance in design, the two measure phrase can be observed as a complete period.

The repetition of the complete period twelve times in the course of the composition constitutes a reflex to dodecaphony, whilst number ‘12’ underlines the theological symbolism as Messiaen defines it.

The element **a** is motionless, functions as a sonic pedal achieving tranquility throughout the composition, symbolizing the eternity of the divine.<sup>7</sup> The composer, in a process to reflect the mankind as opposite to ‘tranquility-eternity,’ exposes element **b** through an ‘asymmetric enlargement’ (or asymmetric augmentation).<sup>8</sup> The other two elements **c** and **d** get progressively transformed through complete rotation up-wards / down-wards.<sup>9</sup>

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<sup>3</sup> <i>Regards</i>	<u>Nos:</u>	1, 7, 12:	Theme and Variations
		2, 4, 5, 9:	Alternate
		3:	Asymmetric Enlargement
		6, 13, 16:	Non- retrogradable
		8, 10, 11, 15, 20:	Sectional
		14, 17:	Strophic

<sup>4</sup> Schwartz, E. & Godfrey, D., 1993: 46.

<sup>5</sup> “The concept of ‘color’ in music influenced by Messiaen’s synaesthesia, a physioneurological condition which enabled the composer to experience... colors when hearing sound. (Green, 2007: 3)

<sup>6</sup> (Green, 2007: 7)

<sup>7</sup> *Ibid.*

<sup>8</sup> Asymmetric enlargement or asymmetric augmentation refers to the same technique and employ chromatic tones that progressively expand the registrar space.

<sup>9</sup> André Riotte systematizing the analysis came up with a simple algebraic formula where the three rotating elements (**b**, **c**, **d**) operate on identical algorithms such as:  $ni+1=ni$ ,  $ni+1=ni+1$ ,  $ni+1=ni-1$  (André Riotte, Chapter 2, 2006: 11)

### III. l'Échange

(Descente en gerbe, montée en spirale ; terrible commerce humano-divin.  
Dieu se fait homme pour nous rendre dieux...)

Bien modéré (♩=50)

(agrandissement asymétrique)

*pp*, *ppp*, *p*, *cresc.*, *cresc. (simile)*, *cresc.*

Ced. \*

Element **a**: m. 1, two upper staves. Element **b**: m. 1, lower staf.  
Element **c**: m. 2 first half. Element **d**: m. 2 second half.

The prolific composer provides us valuable information about his compositional choices and their interconnections with the theological symbolisms in the program notes of *Regards*:

*“Descending spray, rising spiral; awesome human-divine intercourse; God becomes man to make us gods. God is the figure in alternating thirds: that which does not move, that which is very small. Man is the other fragments that grow bigger and become huge following a development procedure that I call ‘asymmetric enlargement.’”*

## Asymmetric Augmentation

Element b

In *L'Exchange*, as in the entire cycle of *Regards*, numerology plays a significant role. Specifically, measure one in metric space of 7/8s and 16 attack points, and measure two in metric space of 4/8s and 14 attack points give the following numeric associations:

(m.1.) 7/8s, 16 attack points

(m.2.) 4/8s, 14 attack points

(m.1.)  $7 \times 2 = 14 + 2 = \mathbf{16}$       (2: measures of the theme)

(m.2.)  $4 \times 3 = 12 + 2 = \mathbf{14}$       (3: rotating elements)

$16 - 2 = 14$

Messiaen didn't merely rely on the metric pulse and sub-groupings of 7/8 and 4/4 time signatures as in common practice. Creatively, he selected the 7/8s and 4/8s metric space of mm. 1 and 2, interconnecting the numerical associations us shown above with theological symbolism.<sup>10</sup>

Element **a** explores the upper half of the piano range and having been static as mentioned earlier, it functions as a pedal giving the impression of a reference point. It is comprised of ten chromatic pitches of the total chromatic distributed in thirds, G and B are omitted.

<sup>10</sup> Number 7 and 14 (7x2) symbolizes the sufferings of Christ on the Cross; number 3 symbolizes Trinity; number 6 and 12 (6x2) symbolizes the Days of Creation. (Green, 2007: 6)

Element **a** (m. 1)

C Fb A D Gb\_\_\_\_  
Ab Db F Bb Eb\_\_\_\_  
F E\_\_\_\_

If hypothetically, we consider C as C=0 of the pitch-class set (0, 1, 2, 3, 4, 5, 6, 8, 9, 10) because it appears as the highest note in element **a**, we can assume that: with the omission of G and B, the brilliant composer overshadows any possible functionality that could be hinted (G: V and B: LT of C: T);<sup>11</sup> thus, explores a sonic space where the sense of functional gravity is totally absent. The effect is further reinforced by element **b**, where G and B are also excluded in its first appearance, taking into account that both elements (**a** and **b**) are superimposed in measure one.

If pc set of element **a** is linearly distributed, it falls into a symmetric pattern: D# E F F# - G# A A# - C C# D [D#], with numerical representation: 4-1-3-1-4 (or 4-5-4). It is obvious that the five attack points of the first half of element **a** and the eight attack points of its second half (5 & 8), as they appear in the piece, are interconnected with the linear symmetry of **a** -as shown above- and so have structural function.

Element **b** at the bass clef of measure one realizes the chromatic trichord D# E F (012) and on the way in which it is assigned it functions as a generating force not only in the first two measures but throughout the composition. Because (012) is assigned to the specific piano tessitura (bass clef), the chromatic character of the whole piece is underlined, placing the interval class that represents the specific chromatic trichord at the fundamental structural level ((012): <210000>). The rhythmic organization of the element **b** derives out of Messiaens 'personage rhythmic.'<sup>12</sup>

Moreover, the distribution of the note durations of element **b** can be numerically represented as: 6-2-6 in units of sixteenths, or 3-1-3 in units of eighths; thus, creating rhythmic symmetry of a dotted quarter silence, two sixteenths and a dotted quarter sound. In other words, the instant attacks of the two sixteenth notes in the middle of m. 1 bridge the two equivalent rhythmic spaces of both sides -silence vs. sound- creating metric symmetry. The great economy on note distribution, attack points, and rhythmic organization, reinforces a well defined tonal space, a wide tonal periphery that later on will be further develop through the inclusion of the omitted pitches leading the sonic space of the piece into completion.

Element **c** of m. 2 is comprised of nine pitches-classes including G and B and is clearly crafted in two fragments, an ascending hexachord and a trichord; pc D# E and F are excluded of the total chromatin in **c**.

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<sup>11</sup> G: V-dominant, B: LT- leading tone, C: T-tonic

<sup>12</sup> <sup>12</sup> Healey, 2004.

The ascending first fragment of **c** {Bb C D F# B C#}, comprises only major and perfect intervals (i: 2, 2, 4, 5, 2), while the second fragment {G G# A} relates to element **b** (012) by T4 and functions as a link between the two elements **b** and **c**.

Element **c**: Bb C D F# B C# : 2 2 4 5 2 // G G# A (012)T4 of **b**  
 Linear distribution of **c**: F# G G# A A# B C C# D (D# E F omitted)

While the first fragment of **c** gets progressively transposed by half step throughout the total chromatic, the second fragment (the trichord) after its first appearance gets transformed through asymmetric enlargement also exploring the total chromatic; however, the principle design of **c** is not modified: first part ascending hexachord, second part disjoined trichord.<sup>13</sup>

Element **d** is distributed in two staves as an aggregate of pitches E F# G# A# B C D D# and is a combination of Messiaen's Mode I (C D E F# G# A#) and Mode II (C Db Eb E F# G A Bb). Specifically the lower tetrachord of Mode I is linked by half step to Mode II (E F# G# A# - B C D Eb). The two tetrachords are related to original Modes by T4 and T11 respectively.

The vertical alignment of the upper and lower parts of **d**, specifically the 1<sup>st</sup>, 2<sup>nd</sup> and 5<sup>th</sup> attack points, create note pairs that reflect the interval content of element **a** (major and minor 3rds):

F# E B  
 Bb C G#

In addition, the 3<sup>rd</sup> and 4<sup>th</sup> attacks of **d** combine D and D# aligned in two note pairs of minor seconds, in cross relation, while E remains static throughout the composition, acting as a link tone between the pitch material of 1<sup>st</sup>, 2<sup>nd</sup>, 5<sup>th</sup>, and 3<sup>rd</sup>, 4<sup>th</sup> attacks points of **d**. The combination of E with D and D# -of the 3<sup>rd</sup> and 4<sup>th</sup> attack of **d** in cross relation- reflects the interval content of the chromatic trichord of **b** {D#, E, F} (012)T11→{DD#E} supporting the coherence between the elements **b**, **c**, and **d**.

Furthermore, the interval distribution (half steps) make E function as upper/lower LT creating locally a tone centrality of E (D - D#→ E). The specific harmonic effect can also be conceived as prolongation of E, locally supporting the symmetry and balance:

D# D  
 E  
 D D#

A macroscopic analysis would have shown us that *L'Echange* is based on 4 elements, with each element being a group of notes over fixed rhythms that stay unchanged; the 4 elements are repeated continuously. The entire piece is developing through the process of 'asymmetrical enlargement,' and is carefully designed in order to create the impression of an endless crescendo, progressively developing from *ppp* to *fff*. With the invention and application of 'asymmetrical enlargement' the composer creates a

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<sup>13</sup> The term 'disjoined trichord' is used here in order to describe the chromatic expansion in opposite directions of the two consecutive intervals of **c**.

huge spiral that every time makes a complete turn, it gets expanded in intensity (dynamics) and intervallic space. The balance of the architectural design of the spiral is achieved through the stability of the unchanged single element **a** which functions as a pedal sonic space – ‘pedal sonority,’ against a continuous transformation – ‘complete rotation’ of the other 3 elements (**b, c, d**).

In the end of the composition ‘catharsis’ is approached by the repetition of element **b** and the first segment of element **a**. Specifically, in the least seven measures, both elements **a** and **b** repeat three times, while element **b** repeats four more times in consecutive measures creating tone centricity of E: Eb → E ← F (012), giving the impression of E serving as the *finalis*. In the last two measures, the composer exposes a cluster of notes that in relation to E are a perfect 4<sup>th</sup> apart (second to last and last measures). Specifically, {A, B, C, D, (E)} can be viewed as an Am with added 9<sup>th</sup> and 11<sup>th</sup> if lined up in thirds, giving the illusion of an ‘Authentic Cadence’ V-i (E-A).

The musical score is presented in four systems, each with a grand staff (treble and bass clefs).  
 - **System 1:** Features a complex rhythmic pattern in the right hand with triplets and sixteenth notes. The left hand has a steady accompaniment. Dynamics include *p* and *ff*. Markings include 'Ped.' and an asterisk (\*).  
 - **System 2:** Continues the rhythmic complexity. Dynamics include *ff*, *mf*, and *fff*. Markings include 'Ped.' and an asterisk (\*).  
 - **System 3:** Shows a more repetitive rhythmic structure. Dynamics include *fff*. Markings include '8<sup>2</sup> ba' and 'Ped.'  
 - **System 4:** The final system, featuring a dense cluster of notes in the bass clef. Dynamics include *fff*. Markings include '8<sup>2</sup> bassa' and 'Ped.'

## Conclusion

Concluding, there are four points that should be highlighted: (a) the complete rotation of the 3 elements (**b, c, d**) is achieved over 24 measures. The twelve repetitions of the two bar phrase can be considered as a hint to dodecaphony. (b) The last 7 measures of the composition refer to a theological symbolism: 7 days of Creation. (c) The illusion of the 'Authentic Cadence' in the end of the piece with pitches E and A acting as Dominant to Tonic support further the harmonic stability in the composition. (d) The static element **a** that functions as a sonic pedal in the piece symbolizes the eternity of the divine. In all four cases numerology and theological symbolism are interconnected. *L'Echange* besides being a symbolic composition, is a masterpiece for its structure. The effective balance in its sonic architecture is a product of the good economy in pitch and rhythmic material. There aren't redundant materials that can cause conflict in the sound result or in the performance practice. The composer proposes a creative way of dealing with pitch in relation to metric space. He proves that the rhythmic repetition as a structural process can be very effective if combined with motion in parameters such as pitch and dynamic. Thus, the craftsmanship in *L'Echange* serves successfully the music essence and meaning, as indicated by the composer:

*More than in any of my preceding works I have sought a language of mystic love that is at once varied, powerful and tender, sometimes brutal, with a multi-color layout.*

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## Appendix 1

### *VINGT REGARDS SUR L'ENFANT JESUS*

REGARD DU PÈRE (THE FATHER'S CONTEPLATION)

REGARD DE L'ÉTOILE (THE CONTEMPLATION OF THE STAR)

L'ÉCHNGE (THE EXCHANGE)

REGARD DE LA VIERGE (THE CONTEMPLATION OF THE VIRGIN)

REGARD DU FILS SUR LE FILS (THE CONTEMPLATION OF THE SON UPON THE SON)

PAR LUI TOUT A ÉTÉ FAIT (THROUGH HIM ALL WAS MADE)

REGARD DE LA CROIX (THE CONTEMPLATION OF CROSS)

REGARD DES HAUTERUS (THE CONTEMPLATION OF HEIGHTS)

REGARD DU TEMPS (TIME'S CONTEMPLATION)

REGARD DE L'ESPRIT DE JOIE (THE CONTEMPLATION OF SPIRIT AND JOY)

PREMIÈRE COMMUNION DE LA VIERGE (THE FIRST COMMUNION OF THE VIRGIN)

LA PAROLE TOUTE PUISSANTE (THE OMNIPOTENT WORD)

NOËL (CHRISTMAS)

REGARD DES ANGES (THE CONTEMPLATION OF THE ANGELS)

LE BAISER DE L'ENFANT JÉSUS (THE KISS OF THE JESUS CHILD)

REGARD DES PROHÈTES, DES BERGERS ET DES MAGES (THE CONTEMPLATION OF THE PROPHETS, THE SHEPHERDS AND THE MAGI)

REGARD DU SILENCE (SILENCE'S CONTEMPLATION)

REGARD DE L'ONCTION TERRIBLE (THE CONTEMPLATION OF THE AWESOME ANNOINTING)

JE DORS, MAIS MON CŒUR VEILLE (I SLEEP, BUT MY HEART KEEPS WATCH)

REGARD DE L'EGLISE D'AMOUR (THE CONTEMPLATION OF THE CHURCH OF LOVE)