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# Understanding the Organ Music of Olivier Messiaen: Optical Illusions Versus Aural Realities

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**UNDERSTANDING THE ORGAN MUSIC OF OLIVIER MESSIAEN:  
OPTICAL ILLUSIONS VERSUS AURAL REALITIES**

**A Thesis  
Presented to the Mary Pappert School of Music  
of Duquesne University**

**As a partial fulfillment for the degree  
of Master of Music in Theory**

**by  
KRISTA ANN SHINEW  
May, 2004**



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DEGREE: Master of Music in Theory  
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*To Kevin Cischke*

...I was an organist by profession. You know there are three families of timbres in an organ: foundation stops, reeds, and mixtures. The foundations stops are, properly speaking, the genuine organ timbre, a flutelike timbre, if you will; the reeds are trumpet timbres, a brassy timbre; but the third family is unique to the organ and exists nowhere else – these are the mixtures, single mutation stops or compounds. Mixtures are essentially stops producing tones other than those played, so when you play a middle C with the cornet stop, you hear, at the same time as that C, its octave, twelfth, fifteenth, and seventeenth. Now, those are the harmonics man has produced artificially by adding pipes to a pipe sounding the fundamental.

In the classics, these clusters of harmonics were always used with the fundamental sound. But, all the same, you'll admit that it is a great temptation for a modern composer eager for change to eliminate the fundamental sound: that's what I did. I used the organ mixtures with their false fifths, false thirds, false octaves, but without the fundamental notes, which created a fourth family, a family consisting only of harmonics, of artificial resonances.

Olivier Messiaen  
(Samuel, 56)

## CONTENTS

Acknowledgements . . . . .	viii
Introduction . . . . .	9
A Basic Understanding of the Organ . . . . .	11
Organ Registration in Theory and Practice . . . . .	18
The Organ at La Sainte Trinité, Paris. . . . .	29
Messiaen: A Timeline of a Musical Life . . . . .	33
Major Influences . . . . .	35
The Technique of My Musical Language: A Summary . . . . .	41
Optical Illusions and Aural Realities . . . . .	51
Conclusion . . . . .	74
Appendix A: Concise List of Organ Terms . . . . .	76
Appendix B: Complete Organ Works . . . . .	79
Appendix C: Discography . . . . .	80
Bibliography . . . . .	81

## **ABSTRACT**

In this thesis, I examine the organ music of Olivier Messiaen both from the viewpoint of a theorist and as an organist. I assert that not only his influences, but also his in-depth understandings of the mutations stops of the organ and what pitches are produced by using these stops inform Messiaen's music. Furthermore, the organ music requires more than mere visual inspection, but must be aurally experienced because of the registration requirements placed in the score by Messiaen. The utilization of mutations often does not produce concert pitch, but other pitches absent in the score. To demonstrate this I provide numerous musical examples throughout this document. Furthermore, I assert that Messiaen's deliberate use of mutation stops is a part of his musical and harmonic language often overlooked as colorful or mere tone painting.

This project would not have been possible without the guidance of my wonderful mentors; Robert Shankovich and Ann Labounsky. Thank you for your wisdom and support. I would also like to thank Kevin, my editor, friend, and sanity. Thank you to my friends Jen Tulodzieski, Kate Clark, and James Kunz for their technical support. Thanks to the staff and choir at Trinity Evangelical Lutheran Church, Wexford, PA. Lastly, and most importantly thank you to my family for their never ending support and encouragement.

## INTRODUCTION

This thesis shall demonstrate that Messiaen's harmonic language cannot be fully understood by a visual analysis because of the specified registrations. Messiaen included very specific registrational instructions for all of his organ works. Any attempt to explain his harmonic language without taking this into consideration will yield an incorrect analysis. Many have termed his odd organ registrations as a matter of color or timbre. But this study shows that Messiaen's registrations are integral to the harmonic language of his organ works.

The thesis will begin with a look at organ disposition. The organ is tonally designed with specific attention given to the harmonic overtone series. A basic knowledge of how the organ is organized is essential. The first section is dedicated to explaining both the natural overtone series as well as how an organ is tonally constructed. Much information will be provided about the stop names and terms specific to the instrument. Most important will be the discussion about the mutation and mixture stops, which do not speak at unison pitch. These stops, to which Messiaen had a great affinity, are the key to fully understanding the aurally perceived, and intended, harmonic language of his organ works.

Messiaen had a strong musical background in theory, composition, improvisation and organ. The second section provides critical information about his formative years and his major influences. It is essential to the argument to demonstrate two things: that Messiaen had a working knowledge of the overtone series as it pertains to organ building, and that he was aware of organ registration in theory and in practice. This knowledge provided the framework for his harmonic language, which discarded or reinvented much

of the traditional use of registration for a more expressive and picturesque palette. Sections three and four, Organ Registration in Theory and in Practice and The Organ at La Sainte Trinité, Paris, go hand in hand in their function. Before one can understand how drastically new and innovative Messiaen's organ registrations were, one must first understand the practices of his forefathers. The organ registration practices as well as stoplists for historically important instruments are laid out by country in the section on organ registration. The stoplist for La Sainte Trinité is then provided with commentary about particular stops, which were atypical to organ building.

The penultimate section is a summary of *The Technique of my Musical Language*. In his treatise, Messiaen explains his harmonic language. It is perhaps the most definitive source of information since it was penned by Messiaen. Sections which are pertinent to understanding his music are summarized to provide a basis for the argument. The thesis will also include numerous quotes and excerpts from his writings and interview in which Messiaen explains organ registration and the feelings that are evoked.

The study will conclude with a section dedicated entirely to collating the information that was presented to support the argument. It will be shown through musical examples, quotes, historical practices, and an examination of Messiaen's organ, that his harmonic language in his organ works can only be fully understood when one takes into consideration the effects of the overtone series as it pertains to the tonal construction of organs. Above all, Messiaen's music and harmonic language cannot be fully understood without the consideration of registration. Experiencing his music is best accomplished by hearing it rather than a visual analysis.

## A BASIC UNDERSTANDING OF THE ORGAN<sup>1</sup>

An organ is not a standardized instrument: each varies in size, number of keyboards, pipes, stoplists, and even tonal design. Thus, not all organs are suited to the performance of all organ literature. Messiaen, for example, left specific registration indications on all of his scores. In order to perform these works the performer must have a broad understanding of the technique of organ registration and an organ that was built with the late romantic/early twentieth century literature in mind. This chapter provides the basic understanding of the organ stops and the overtone, harmonic, and partial series thereof.

The organ is constructed with a relationship from an individual pipe to larger groups of pipes (which are brought on by stops). This begins with one pipe being associated with its family of pipes (ranks) which are combined to make choruses. If one thinks in terms of the organ being similar to an orchestra, the pipes are like the individual musicians, the ranks similar to the sections such as the violins, violas, or cellos and the chorus a larger grouping such as the strings, brass or winds. Each rank consists of a family of pipes and each correlates to one specific key on the keyboard. Generally, the pipes are graduated in length and diameter with the longest pipe producing the lowest note.<sup>2</sup> Each rank is brought on by a stop which is controlled from the console. The individual drawstops (registers) are labeled by the category of the stop, the pitch level,

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<sup>1</sup> While this paper deals primarily with pipe organs it may also be applied to electronic or digital instruments. Electronic and digital instruments may have specifications similar to pipe organs however, there is one major difference. Unless the sound produced by the electronic or digital instruments is accomplished through sampling sounds from an actual pipe organ the tone produced will be only the fundamental without the presence of any overtones.

<sup>2</sup> There are exceptions to this in that some pipes are half length but still produce tones an octave lower.

and the number of ranks of pipes (indicated by Roman Numerals).<sup>3</sup> In cases where Roman Numerals are absent it is understood that there is only one rank. The choruses of the organ are built using stops of the same tone color and family such as the flute chorus, reed chorus, or the principal chorus. The reed chorus consists of reeds from generally the same rank; in other words it would not be suitable to combine a crumhorn with a trumpet or oboe. Generally, the reed chorus is derived from the stops available on the great division. The principal chorus must be built using all of the ranks of principal origin (including the mixtures). Similarly, the flute chorus is the principal chorus with the flutes added to it. To keep the registrations clear, the mutation stops are not customarily added to the choruses.

The pitch level of the stop in the organ is expressed in terms of the speaking length of the lowest pipe (low C) in the rank.<sup>4</sup> A label at 8' indicates the pipes are at unison pitch. This means that the pitch directly corresponds to the notes on a piano. As one progresses up the octaves the label halves. Thus a 4' pitch level would speak an octave higher and a 2' would sound two octaves higher. Conversely, as the pitch levels double the pitch is lowered by an octave. A 16' pipe speaks an octave lower than the written pitch and a 32' sounds two octaves lower. Along with the stops that sound various unison pitches there are also mutation stops which emphasize non-unison partials in the harmonic series.

The harmonic series is the natural and orderly spectrum of pure tones (called overtones, harmonics, or partials) which sound above the fundamental pitch of a musical

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<sup>3</sup> Roger E. Davis, *The Organists' Manual; Technical Studies and Selected Compositions for the Organ*, 1<sup>st</sup> ed., (New York: W. W. Norton and Company, 1985), 200.

<sup>4</sup> *Ibid.*, 187.

tone.<sup>5</sup> The color or timbre of each stop is determined by the presence, absence, and the intensity of the overtones.<sup>6</sup> Overtones, or partials are present in a musical tone because a vibrating body, such as an air column in a flute pipe, vibrates not only as a whole, but also in parts of the whole as well (1/2, 1/3, 1/4, etc.). The fractional vibrations produce overtones. Therefore, the overtone frequencies for a particular tone can be calculated using the frequency of the fundamental.<sup>7</sup> Using these calculations the first sixteen fundamentals can be determined as follows<sup>8</sup>

<u>Partial</u>	<u>Overtone</u>
Fundamental	C3- Unison
1 <sup>st</sup> Partial	C4- 8va Higher
2 <sup>nd</sup> Partial	G4- 12 <sup>th</sup> Higher
3 <sup>rd</sup> Partial	C5- 2 8vas Higher
4 <sup>th</sup> Partial	E5- 2 8vas and M3 Higher
5 <sup>th</sup> Partial	G5 2 8vas and P5 Higher
6 <sup>th</sup> Partial	<i>Bb5- 2 8vas and m7 Higher</i>
7 <sup>th</sup> Partial	C6- 3 8vas Higher
8 <sup>th</sup> Partial	D6- 3 8vas and M2 Higher
9 <sup>th</sup> Partial	E6- 3 8vas and M3 Higher
10 <sup>th</sup> Partial	<i>F#6- 3 8vas and P6 Higher</i>
11 <sup>th</sup> Partial	G6- 3 8vas and P5 Higher
12 <sup>th</sup> Partial	<i>A6- 3 8vas and P6 Higher</i>
13 <sup>th</sup> Partial	<i>Bb6- 3 8vas and m7 Higher</i>
14 <sup>th</sup> Partial	<i>B- 8vas and M7 Higher</i>
15 <sup>th</sup> Partial	C7- 4 8vas Higher

The explanation of organ stops continues with the mutations which are derived from the harmonic series. The octave and all the higher mutation stops introduce the

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<sup>5</sup> Ibid., 198.

<sup>6</sup> Poul Gerhard Andersen, *Organ Building and Desing*, trans. Joanne Curnutt (New York: Oxford University Press, 1969), 23.

<sup>7</sup> Davis, 198.

<sup>8</sup> The notation of overtones is merely an approximation. Those overtones that are not encompassed in an equal-tempered tuning of a keyboard and deviate widely from those pitches are noted in italics.

harmonics naturally present, but in an undesirable weak condition, in the prime tones of the foundation unison stops.<sup>9</sup> Thus the entire organ and all of its ranks are derived from the harmonic series of the lowest rank. Unlike the stops that speak at some derivative of the unison pitch which are labeled with whole numbers (32',16',8', etc.) there are other stops labeled with fractions. These stops produce the off-unison partials and are referred to as mutations. There are four pitch levels to produce the non-unison pitches of a fifth, third, flat seven, and second. They are labeled as follows along with their most common stop names respectively:  $2 \frac{2}{3}'$  or  $1 \frac{1}{3}'$  (nasard, quinte the latter of which may also be called a larigot),  $1 \frac{3}{5}'$  (tierce),  $1 \frac{1}{7}'$  (septième), and the  $\frac{8}{9}$  (neuvième). These stops produce the pitches correlating to the second, fourth, fifth, sixth, and eighth partials.

Diagram of organ stops with relation to the upper harmonics

<u>Note Names</u>	<u>32' Harmonic Series</u>	<u>16' Harmonic Series</u>	<u>8' Harmonic Series</u>
CCCC	Prime Tone		
DDDD			
EEEE			
FFFF			
GGGG			
AAAA			
BBBB			
CCC	1 <sup>st</sup> Partial	Prime Tone	
DDD			
EEE			

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<sup>9</sup> George Ashdown Audsley, *The art of organ-building; a comprehensive historical, theoretical, and practical treatise on the tonal appointment and mechanical construction of concert-room, church, and chamber organs*, vol.1 (New York: Dover Publications, 1965), 405-406.

FFF			
GGG	2 <sup>nd</sup> Partial		
AAA			
BBB			
CC	3 <sup>rd</sup> Partial	1 <sup>st</sup> Partial	Prime Tone
DD			
EE	4 <sup>th</sup> Partial		
FF			
GG	5 <sup>th</sup> Partial	2 <sup>nd</sup> Partial	
AA	6 <sup>th</sup> Partial = Flat 7		
BB			
C	7 <sup>th</sup> Partial	3 <sup>rd</sup> Partial	1 <sup>st</sup> Partial
D	8 <sup>th</sup> Partial		
E		4 <sup>th</sup> Partial	
F			
G		5 <sup>th</sup> Partial	2 <sup>nd</sup> Partial
A		6 <sup>th</sup> Partial = Flat 7	
B			
c		7 <sup>th</sup> Partial	3 <sup>rd</sup> Partial
d		8 <sup>th</sup> Partial	
e			4 <sup>th</sup> Partial
f			
g			5 <sup>th</sup> Partial
a			6 <sup>th</sup> Partial = Flat 7
b			
c1			7 <sup>th</sup> Partial
d1			8 <sup>th</sup> Partial

The chart ends after the eighth partial because the pitches produced were either doubled by the ranks in the higher octaves or they are not typically reinforced in the tonal design of organs (such as the tenth partial which is a sharp four and the twelfth yielding a sixth). The first, third, and seventh partials correlate with the unison speaking stops (32', 16', 8', etc.), the second and fifth with nasard, quinte, and larigot stops ( $2\frac{2}{3}'$ , or  $1\frac{1}{3}'$ ), the fourth partial with the tierce ( $1\frac{3}{5}'$ ), the sixth partial with the septième ( $1\frac{1}{7}'$ ), and the eighth with the neuvième ( $\frac{8}{9}'$ ).<sup>10</sup>

The final set of stops on the organ that need explanation are the mixtures. A mixture is a compound stop consisting of two or more ranks of high-pitched principal pipes which reinforce octave and quint overtones.<sup>11</sup> A Roman Numeral following the stop name indicates the number of ranks within the mixture. Mixtures serve primarily to reinforce the principal chorus as it enters into the higher octaves and the natural sounds of the chorus become noticeably weaker.<sup>12</sup> The tonal design of mixtures deviates from organ to organ and builder to builder. These differences are caused by the break backs of the stop. As a mixture progresses up the scale the pipes become smaller and the pitches higher. When the pipes become too small and the pitches inaudible by the human ear the mixture breaks back. That is to say that the highest pitch is discontinued and a new lowest pitch is introduced.<sup>13</sup> In a low pitched mixture there may only be three to four breaks, however; in a higher mixture there may be more than eight breaks.<sup>14</sup> Although

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<sup>10</sup> The chart is adapted from the one found in *The Art of Organ-Building* on pp. 409-410.

<sup>11</sup> Davis, 200.

<sup>12</sup> Stevens Irwin, *The Dictionary of Pipe Organ Stops*, 2<sup>nd</sup> ed., (New York: Schirmer Books, c1983).

<sup>13</sup> Davis, 200.

<sup>14</sup> Ibid.

mixtures are not unified the following guidelines may be referred to for a basic understanding of the stop. The lowest mixtures are labeled as mixture, fouriture, or plein-jeu and consist of four to six ranks (Roman Numerals IV,V,VI on the stop tab indicate the number of ranks). A four rank of one of these mixtures would produce the pitches at  $1\frac{1}{3}'$ ,  $1'$ ,  $\frac{2}{3}'$ , and  $\frac{1}{2}'$ . The fifth rank would add a  $2'$  and the sixth a  $2\frac{2}{3}'$ .<sup>15</sup> The highest mixture on an organ is labeled as a cymbel and consists of pitches at  $\frac{1}{2}'$ ,  $\frac{1}{3}'$ ,  $\frac{1}{4}'$ ,  $\frac{1}{6}'$ , and  $\frac{1}{8}'$ .<sup>16</sup> The scharf is designed to fall in between the mixture, fouriture, or plein-jeu and the cymbel. All of the aforementioned mixtures reinforce only the octave and the quint tones. Less common are the tertz-cymbel and carillon which reinforce the octave and the third instead of the fifth. It is key to remember that mixtures are not uniform stops. As a result, it is not possible to know the exact tonal construction of the mixtures on Messiaen's instrument.

It is these two final categories, especially that of mutations to which Messiaen had a great affinity as is evident in his choice of additions to his instrument. In return, these stops add a new dimension to Messiaen's harmonic language.

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<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

## ORGAN REGISTRATION IN THEORY AND PRACTICE

“The function of registration is to enhance what is inherent in the music, and to the listener. Like all means of interpretation, it [registration] should be suggested by the music, not superimposed on the music.”<sup>17</sup> To best understand the uniqueness of Messiaen’s registrational implications and the effect on his tonal language, one must first be well-versed in the registration practices of his predecessors. These practices are derived from the study of historical instruments and characteristic traits of representative builders. Although the registrations may employ mutations either in choruses or to create a solo stop there is no aural affect on the intended harmonies.

The organ at the beginning of the sixteenth century consisted of one large quint mixture,<sup>18</sup> whose ranks could not be individually separated out.<sup>19</sup> Hence, as builders began to develop methods of separating the individual ranks, the term ‘stop’ was applied to the method of pulling out only one rank and ‘stopping’ the sound of the others. The quint mixture contained principals and mutations. The mutations were based only on the fifth as the tierce was not yet employed. Documentation of the Praetorius organ (16<sup>th</sup> century) is the earliest source of information on the tonal construction of organs. The blockwerk, large quint mixture, of this instrument consisted of principals sounding together at the pitch levels of 8’, 4’, 2 2/3’, 2’, 1 1/3’, and 1/2’.<sup>20</sup> As building practices evolved and instruments developed, organs were characterized by national origin.

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<sup>17</sup> Harold E. Geer, *Organ Registration in Theory and Practice* (J. Fishcer, 1957), 122.

<sup>18</sup> This is a mixture that has a strong reinforcement of the fifth.

<sup>19</sup> Geer, 229.

<sup>20</sup> William Wright, *the Instrument and Its Literature* (Copyright William Wright, 1994 – 2003), 3.

## Italy

Italian organs of the sixteenth century commonly had diapason, flute, voce umana, fiffaro, and reed stops, but lacked mixtures. By the mid 1550s Italian organs had become standardized. The Antegnati family were the influential organ builders during this era in Italy. The following stoplist, typical to Italian organs, is taken from S.

Giuseppe, in Brescia built in 1581 by Antegnati.<sup>21 22</sup>

### Great

Principale 8'

Ottave 4'

Decimaquinta 2'

Decimanona 1 1/3'

Vigesimaseconda 1'

Vigesimasesta 2/3'

Vigesimanona 1/2'

Treigesimaterza 1/3'

### Swell

Flauto in ottava 4'

Flauto in duodecima 2 2/3'

Flauto in decimaquinta 2'

Both Diruta in his treatise *Il Transilvano* and Costanzo Antegnati in *Arte Organica* describe the registration practices in Italy. Antegnati lists and describes twelve possible combinations and their uses:

1. Ripieno (full organ): All stops except the divided principal and the flutes. This was used for preludes, toccatas, etc.
2. Mezzo ripieno (medium organ): principal 16', octave 8', twenty-ninth 1', twenty-third 2/3', flute 8'.
3. Principal 8', octave 8', flute 8'.
4. Principal 16', flute 8'.
5. Octave 8', nineteenth 2 2/3', flute 8', flute 2'. This was intended to give the effect of a cornet (the cornet will be explained in the subsection on French organs p.24 ).
6. Octave 8', flute 8'. This was considered good for melodic clarity, and therefore adapted to polyphony and ornamentation.
7. Same as Number 6 with tremolo added. Since the tremolo impaired the clarity this was reserved for sustained music.
8. Principal 16' alone. A very delicate effect, suitable for the Elevation in the Mass.

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<sup>21</sup> Ibid., 53.

<sup>22</sup> Italian stops were not given colorful names, they were named based on the overtone series.

9. The two principals 16'.
10. Flute 8' alone.
11. Flute 8', divided principal 16' (treble only) – for dialogue.
12. Principal 16', flute 4'. This was thought particularly suited to ornamentation. The addition of the octave 8' to this combination was also considered effective.<sup>23</sup>

The flutes 4' and 2 2/3' were regarded as solo stops.<sup>24</sup> Diruta's registration suggestions are similar as far as combinations. However, he suggests registrations that correlate with specific church modes:

- Mode 1 (dignified): principal 16', octave 8', with the possible addition of the fifteenth 4', and flute 4'.
- Mode 2 (melancholy): principal 16' with tremolo
- Mode 3 (plaintive): principal 16', flute 8'.
- Mode 4 (sad): same as for Mode 2.
- Mode 5 (cheerful): octave 8', flute 4', twenty-second 2'.
- Mode 6 (devotional): principal 16', octave 8', flute 4'.
- Mode 7 (bright): octave 8', fifteenth 4', twenty-second 2'.
- Mode 8 (pleasant); flute 8' or octave 8', twenty-second 2'.
- Mode 9 (similar): principal 16', fifteenth 4', twenty-second 2'.
- Mode 10 (gloomy): principal 16', octave 8' or principal 16', flute 8'.
- Mode 11-12 (happy – pleasant and animated): flute 8' or flute 8', twenty-second 2' or flute 8', octave 8', fifteenth 4'.
- Mode 12: particularly flute 8' or the last combination.<sup>25</sup>

The most important things to note in Italian organ building and registration practices for the given purpose are the absence of the mutations based on the third, and the use of the other mutations (either in a chorus to enhance the upper partials of the principals or as solo effects).

## Spain

The organs of Spain are typified by the Imperial Organ in the Cathedral of Toledo. There is a domination of reeds and mixtures. The cornet, which is built using

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<sup>23</sup> Geer, 233.

<sup>24</sup> Wright, 54.

<sup>25</sup> Geer, 234.

the 8', 4', 2 2/3', 2', and 1 3/5', is one of the first instances that the partial of the third is used. However, the third is confined to the treble so as not to be separated out by the listener in the lower register.<sup>26</sup> The stoplist of the Imperial Organ was as follows:<sup>27</sup>

Lower Manual

Diapasons 16', 8', 4'  
 Gedeckt 16'  
 Trumpets 16', 8', 4', 4', 2'

Pedal

Diapasons 32', 16', 8', 4', 2', 1'  
 Wood Diapason 16'  
 Trumpets 16', 8', 2'

Upper Manual

Diapasons 16', 8', 4', 2'  
 Gedeckts 8', 4'  
 Violetas 8'  
 Flute Celeste 8'  
 Twelfth 2 2/3'  
 Fifteenth 2'  
 Cornet vii-xiii  
 Mixtures viii, v  
 Llano (high mixture) viii  
 Trumpets 16', 8', 8', 4'

Again one should note that there are few mutations, none of which is based on the third.

The mixtures which do contain the third are used solely to reinforce the upper partials of the principal chorus.

**The Netherlands**

The Dutch composer, Sweelinck, was also known as an organ building expert.<sup>28</sup> In 1953 an important historical document was found containing the stoplist for the large organ at Oude Kerk in Amsterdam. This organ was installed and maintained under Sweelinck's supervision. The stoplist follows:<sup>29</sup>

Rugpositief

Prestant 8'  
 Quintadeen 8'  
 Baarpijp 8'  
 Octaaf 4'  
 Holpijp 4'  
 Sifflet 1 1/3'

Hoofdwerk

Prestant 16'  
 Octaaf 8'  
 Mixtuur  
 Scherp (high mixture)

Bovenwerk

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<sup>26</sup> Ibid., 239.

<sup>27</sup> Ibid.

<sup>28</sup> Ibid., 255 footnote 12.

<sup>29</sup> Ibid., 526.

Mixtuur	Prestant 8'
Scherp	Holpijp 8'
Kromhoorn 8'	Zink 8'
Schalmei 4'	Openfluit 4'
	Nasard 2 2/3'
<u>Pedaal</u>	Gemshoorn 2'
Trompet 8'	Sifflet 1 1/3'
Nachhoorn 2'	Terscimbel
	Trompet 8'

Dutch organs commonly favored mutations based on the fifth but neglected those that reinforced the third.

### **Germany**

Germany had the most diversity in the characteristics of their organs. The North and South German instruments were vastly different. The North German organs were characterized by a large *hauptwerk* usually based on a 16' principal with reeds in *absentia*. There is typically a large variety of stops at pitches 8' and 4'.<sup>30</sup> The *hauptwerk* is comprised of a full principal chorus, two to four foundation stops, a large full mixture, a second high mixture, and a wide-scale<sup>31</sup> chorus made up of single ranks, reeds, and solo stops. The *rückpositif* generally had both a narrow and a wide-scale chorus, and a plethora of reeds. The *oberwerk* consisted of primarily wide-scale stops, trumpet, and solo stops.<sup>32</sup> The pedal divisions were small as the pedal was usually limited to playing the *cantus firmus*.<sup>33</sup> The tierce stop (mutation based on the third) was not introduced to German organ building until 1636 at which time it was first used by Fritzsche.<sup>34</sup> The

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<sup>30</sup> Wright, 20-21.

<sup>31</sup> Scaling refers to the diameter of a pipe. The diameter does not effect the pitch level but rather fullness of the sound. Occasionally it will manipulate the partials.

<sup>32</sup> Geer, 265.

<sup>33</sup> Wright, 22.

<sup>34</sup> Ibid.

most influential North German organ builder was Schnitger. An example of his instrument from 1704 contains the following stoplist.<sup>35</sup>

Hauptwerk

Gedackt 8'  
Quintatön 8'  
Praestant 4'  
Spitzflöte 4'  
Scharfquinte 2 2/3'  
Oktave 2'  
Nasatquinte 1 1/3'  
Mistur III, IV-VI  
Trompete 8'

Brustwerk<sup>36</sup>

Gedackt 8'  
Blockflöte 4'  
Octave 2'  
Schweizerpfeife 1 1/3'  
Zimbell III  
Krummhorn 8'

Pedal

Untersatz 16'  
Praestant 8'  
Octave 4'  
Mixture IV  
Posaune 16'  
Cornett 2'

The organs of Southern Germany had a more extensive pedalboard because the repertoire often featured a number of virtuosic pedal solos. Silbermann was the most noteworthy organ builder of this geographical area. His organs typically had mixtures with pipes sounding at the third and lacked in reeds and mutations. Silbermann relied on the 8' and 4' stops for color.<sup>37</sup> One of his most important instruments, built in 1710-14, was at Freiberg Cathedral in Saxony with a stoplist of:<sup>38</sup>

Hauptwerk

Bourdon 16'  
Prinzpal 8'  
Rohrflöte 8'  
Viola de Gamba 8'  
Oktave 4'  
Quinte 2 2/3'  
Superoktave 2'  
Tierce 1 3/5'

Oberwerk

Quintadena 16'  
Prinzpal 8'  
Gedackt 8'  
Quintadena 8'  
Oktave 4'  
Spitzflöte 4'  
Superoktave 2'  
Flachflöte 1'

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<sup>35</sup> Ibid., 23.

<sup>36</sup> There is no equivalent of a brustwerke on American or French organs.

<sup>37</sup> Wright, 44-45.

<sup>38</sup> Ibid.

Mixtur IV  
Zimbel III  
Cornet V  
Trompete 8'  
Clarin 4'

Brustwerk  
Gedackt 8'  
Prinzipal 4'  
Rohrflöte 8'  
Nasat 2 2/3'  
Oktave 2'  
Tierce 1 3/5'  
Quinte 1 1/3'  
Sifflöte 1'  
Mixtur III

Mixtur III  
Zimbel III  
Cornet V  
Krummhorn 8'  
Vox humana 8'

Pedal  
Untersatz 32'  
Prinzipal 16'  
Oktave 16'  
Subbass 16'  
Oktave 8'  
Oktave 4'  
Mixtur VI  
Posaune 16'  
Trompete 8'  
Clarin 4'

The Italian, Spanish, Dutch, and German organs all have some shared characteristics as do their registrational practices. All of the organs have few mutations and (with the exception of those built after 1636 in Germany) are restrained to the fifth. The third is not introduced as a separated mutation until later. As for registration practices, the mutations are used in primarily two ways: with the chorus to enhance the upper partials, or as a solo stop. In either case, there is no aural effect on the harmonic language of the piece.

### **France**

French organs and registration practices vary greatly from the aforementioned countries. The tierce was common on French organs and in registrations. It was often used in the *plein jeu* (similar to principal chorus) or as a solo. The famous French stop the cornet, composed of 8', 4', 2 2/3', 2', and 1 3/5' brought on simultaneously by one stop, used the tierce. However, as the cornet descended below middle C the tierce was

omitted because it could be aurally perceived as a non-unison partial.<sup>39</sup> As the seventeenth century began, “procedures became conventionalized, and composers wrote with specific registrations in mind.”<sup>40</sup> The most exact information about the early registration practices comes from seventeenth and eighteenth century France. Composers began titling pieces by the registrations to be used. One of the most famous French organs from this time is the instrument at Saint-Louis Des Invalides in Paris. It was built by Thierry in 1679-87 with the following specifications:<sup>41</sup>

Grand Orgue

Montre 16’  
 Bourdon 16’  
 Montre 8’  
 Bourdon 8’  
 Prestant 4’  
 Grosse Tierce 3 1/5’  
 Nasard 2 2/3’  
 Doublette 2’  
 Quarte de Nasard 2’  
 Tierce 1 3/5’  
 Fourniture V  
 Cymbale IV  
 Cornet V  
 Trompette 8’  
 Clairon 4’  
 Voix humaine 8’

Récit

Cornet V  
 Trompette 8’

Pédale

Flûte 8’  
 Trompette 8’

Positif

Montre 8’  
 Bourdon 8’  
 Prestant 4’  
 Flûte 4’  
 Nasard 2 2/3’  
 Doublette 2’  
 Tierce 1 3/5’  
 Larigot 1 3/5’  
 Fourniture III  
 Cymbale II  
 Voix humaine 8’

Echo

Bourdon 8’  
 Flûte 4’  
 Nasard 2 2/3’  
 Quarte 2’  
 Tierce 1 3/5’  
 Cymbale II  
 Cromorne 8’

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<sup>39</sup> Ibid., 73.

<sup>40</sup> Geer, 248.

<sup>41</sup> Wright, 73.

There is a noticeable increase in the number of mutations as well as a remarkable percentage of those which produce the third. The following combinations were used during the seventeenth and eighteenth centuries in France and remained standard until the French Revolution (1789 – 1799).

#### Registration Combinations<sup>27</sup>

Plein Jeu: Principals 16', 8', 4', and mixtures (cornet and flute mutations omitted.)

Grand Jeu: Reeds, foundation stops at 8', 4', 2', nasard, and tierce.

Peitit Jeu: Cromorne and foundation stops at 8', 4', nasard, and tierce.

Cornet: A compound five rank treble stop beginning at middle C and including 8', 4', 2 2/3', 2', and 1 3/5'.

Petit Cornet: Foundation stops 8' – 1' without duplication and mutation but, including the tierce.

Tierce en Taille or Basse de Tierce: Flutes 8', 4', 2 2/3', and 1 3/5'.

Grand Tierce: The above with the addition of the cornet, bourdon 16', 3 1/5', and 5 1/3'.

Nasard: Similar to the tierce registration omitting the tierce.

Basse de Trompette: Trompette 8', 4', and prestant 8'.

Basse de Cromorne: Cromorne 8', bourdon 8', 4', and prestant 8'.

Voix humaine: Voix humaine, bourdon 8', flute 4' and tremblant.

Jeu Doux: Either bourdon 8' and flute 4' or bourdon 16', 8'.

Concert de Flutes: Flutes 8', 4'.

Fugue: Trompette, clarion, some foundation stops and cromorne.

Duo: Two jeux de tierce.

As is evident, the French registrations are more inclined toward the use of mutations.

However, there was an awareness of the aural perception of the mutations dividing out below middle c. Therefore, the tierce was rarely used below that point.

The French revolution ended the eighteenth century. During this time, many of the French organs were destroyed and very little was written for the instrument. As musical compositions turned away from polyphony to the more dense harmonies of romanticism, the organs underwent major tonal changes. The organ became orchestral in nature and moved away from the clarity of the voices to the color of numerous mutation stops.<sup>28</sup> The new characteristics of French organs can be seen in the instruments of

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<sup>27</sup> Adapted from Geer pp. 248-249 and Wright pp. 74-75

Cavaillé-Coll. This stoplist is from St. Denis built in 1841 as is characteristic of Cavaillé-Coll.<sup>29</sup>

Grand Orgue

Montre 32'  
Montre 16'  
Bourdon 16'  
Flûte harmonique 8'  
Viola de gambe 8'  
Bourdon 8'  
Prestant 4'  
Flûte octavante 4'  
Quinte 2 2/3'  
Doublette 2'  
Grande Fourniture IV  
Grande Cymbale IV  
I Trompette 8'  
II Trompette 8'  
Basson 8'  
Clairon harmonique 4'  
Cornet à pavillon 8'

Recit

Flûte harmonique 8'  
Bourdon 8'  
Flûte octavante 4'  
Quinte 2 2/3'  
Octavin 2'  
Trompette harmonique 8'  
Voix humaine 8'  
Clairon harmonique 4'

Pedales

Flûte ouverte 32'  
Flûte ouverte 16'  
Flûte ouverte 8'  
Flûte ouverte 4'  
Grande Nasard 5 1/3'

Positif

Bourdon 16'  
Salicional 8'  
Flûte harmonique 8'  
Bourdon 8'  
Flûte octavante 4'  
Flûte 4'  
Nasard 2 2/3'  
Doublette 2'  
Octavin 2'  
Tierce 1 3/5'  
Fourniture IV  
Cymbale IV  
Trompette harmonique 8'  
Trompette harmonique 8'  
Cromorne 8'  
Cormorne 4'

Bombardes

Bourdon 16'  
Bourdon 8'  
Flûte 8'  
Prestant 4'  
Nasard 2 2/3'  
Doublette 2'  
Grand Cornet VII  
Bombarde 16'  
I Trompette 8'  
II Trompette 8'  
I Clairon 4'  
II Clairon 4'

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<sup>28</sup> Geer, 288.

<sup>29</sup> Wright, 46.

Bombarde 16'  
Basse-contre 16'  
Basson 8'  
I Trompette 8'  
II Trompette 8'  
I Clairon 4'  
II Clairon 4'

Modern organs may take on any combination of characteristics from the most ancient of instruments to those of Cavallé-Coll. The registrations of an organ are much like the palette of an artist providing color and nuance. The more suitably a player can register the better he understands his instrument.

## THE ORGAN AT LA SAINTE TRINITÉ, PARIS

Olivier Messiaen spent the majority of his life serving as the organist at La Sainte Trinité in Paris. It is that particular instrument the composer had in mind as he composed for the organ. Messiaen had the privilege of overseeing a number of tonal additions and rebuilds to the organ. The importance of the mutations and other color stops of the organ, (again in comparison with an orchestra the color stops would be like the solo bassoon or horn) many of which were added to his specifications, are key to Messiaen's compositions.<sup>42</sup>

The organ at La Sainte Trinité was built in 1869 by Cavaillé-Coll and incurred major damage so it was rebuilt by the same company in 1871. The original organ consisted of 45 ranks over three manuals and pedal. In 1901, the organ was renovated by Société Merklin, not the group that succeeded Cavaillé-Coll. The gambas were hardened, tuning notches were cut into the harmonic flutes, and the reed stop volume was increased. Due to economic reasons, all of these alterations were done without a titulaire's approval. The titular Alexandre Guilmant, refused to sign for the work and eventually resigned the position. Charles Quef agreed to sign for the work that had already been completed and in doing so preceded Messiaen as titulaire at La Sainte Trinité.

The original stoplist for La Trinité in 1931, when Messiaen accepted the position, is as follows.<sup>43</sup>

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<sup>42</sup> Michel Roubinet in *Messiaen, par lui-me*, EMI Classics CVS 7674002, 1992, CD.

<sup>43</sup> Peter Hill, ed., *The Messiaen Companion*, ed. Peter Hill (Portland, Or.: Amadeus Press, 1995), 526.

### Grand-Orgue

16' Montre  
16' Bourdon  
8' Montre  
8' Bourdon  
8' Flûte Harmonique  
8' Gambe  
4' Prestant  
2 2/3' Quinte  
V Cornet  
III – VI Plein Jeu  
16' Bombarde  
8' Trompette  
4' Clairon

### Positif

16' Quintaton  
8' Flûte Harmonique  
8' Salicional  
8' Unda Maris  
4' Prestant  
4' Flûte Octaviane  
2' Doublette  
I Piccolo  
II – V Cornet  
16' Basson  
8' Clairnette  
8' Trompette

### Récit-expressif

8' Bourdon  
8' Flûte Traversière  
8' Voile de gambe  
8' Voix Céleste  
4' Flûte Octaviane  
2' Octaciane  
8' Trompette  
8' Basson – Houtbois  
8' Voix Humaine  
4' Clairon

### Pédale

32' Soubasse  
16' Contrebasse  
16' Soubasse  
8' Flûte  
8' Bourdon  
8' Violoncello  
4' Flûte  
16' Bombarde  
8' Trompette  
4' Clairon

\*There is some debate however if there was a 4' flute octaviane on the original stoplist of the grand-orgue or if it appeared later. It is not shown on this stoplist.<sup>44</sup>

It is of great importance to note that at the time Messiaen accepted the position at La Trinité the organ had only three mixtures (two on the grand-orgue and one on the positif) and one mutation at the quint on the grand-orgue.

In 1934, seven new stops were added to the instrument under the advisement of Messiaen. The addition of a Barker lever for the positif was also done at this time

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<sup>44</sup> The debate about this particular stop was the time that it appeared on the organ. It may have appeared on the original stop list or may have been added by Messiaen at some other point prior to 1934.

making it easier to play the récit/positif. This work was done by the Pleyel-Cavaillé-Coll company.<sup>45</sup> The stops that were added to the instrument were:<sup>46</sup>

<u>Grand-Orgue</u>	<u>Positif</u>	<u>Récit-expressif</u>
4' Flute	8' Principal	16' Bourdon
	8' Cor de Nuir	2 2/3' Nasard
	2 2/3' Nasard	III Cymbale
	I 3/5' Tierce	

Over half of the stops added to the instrument were either mixtures or mutations. For the first time in its existence the instrument had a mutation that was based on a third. The addition of the nasard to both the positif and récit-expressif was key in that now each of the three manuals had a mutation stop based on the non-union pitch of the fifth.

In 1962-65 the organ was again rebuilt, this time by Beuchet-Debierre under the supervision of Messiaen.<sup>47</sup> The stop and key actions were electrified, windchests modified, a new console and combination system were devised, seven of the positif stops were put under expression, and eight more stops were added. During this renovation, Messiaen insisted that the 1868-71 Cavaillé-Coll stops be left completely unaltered. The stoplist at the time of Messiaen's death was as follows:<sup>48</sup>

<u>Grand-Orgue</u>	<u>Positif non expressive</u>	<u>Récit-expressif</u>
16' Montre	16' Quintaton	16' Bourdon
16' Bourdon	8' Principal	8' Flûte Traversière
8' Montre	8' Flûte Harmonique	8' Bourdon
8' Bourdon	8' Salicional	8' Gambe
8' Flûte Harmonique	8' Unda maris	8' Voix Céleste
8' Gambe	4' Prestant	4' Flûte Octaviante
4' Prestant	2' Doublette	2 2/3' Nasard
4' Flûte	II – V Cornet	2' Octavin
2 2/3' Doublette	16' Basson	III Cymbale

<sup>45</sup> Roubinet.

<sup>46</sup> Hill, 527.

<sup>47</sup> Roubinet.

<sup>48</sup> Hill, 528.

V Plein Jeu  
(recompositional)  
IV Cymbale

8' Trompette  
4' Clairon

16' Bombarde  
8' Trompette  
4' Clairon

Grand-Orgue

V Cornet  
16' Bombarde  
8' Trompette  
4' Clairon

Positif expressif

8' Cor de Nuit  
4' Flûte Douce  
2 2/3' Nasard  
2' Flageolt  
1 3/5' Tierce  
1' Piccolo  
8' Clairnette

Récit-expressif

8' Basson-Hautbois

Pédale

32' Soubasse  
16' Contrebasse  
16' Soubasse  
8' Flûte  
8' Bourdon  
4' Flûte  
IV Plein Jeu  
16' Bombarde  
8' Trompette  
4' Clairon

At the time of his death, Messiaen had added the mutations built on the second and fourth partials, as well as having laid plans for the addition of two new mutations on the récit: a septième  $1 \frac{1}{7}'$  and a neuvième  $8/9'$  (both of which are rare), as well as a 32' bombarde on the pédale and an 8' trompette en chamade.<sup>49</sup>

Through tracing the evolution of the organ at la Trinité, it is clear to see that Messiaen had a great affinity toward the non-unison and mixture stops. This became a key characteristic in his organ compositions – one that expanded his harmonic language.

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<sup>49</sup> Hill, 528.

## MESSIAEN: A TIMELINE OF A MUSICAL LIFE<sup>50</sup>

- 1908** – Born December 10<sup>th</sup> in Avignon, France.
- 1914** – Moves to Grenoble and begins teaching himself piano.<sup>51</sup>
- 1917** – Messiaen takes his first formal piano lessons with Misser Véron Gontran Arcouët.
- 1918** – Messiaen receives a copy of Debussy's *Pelléas et Mélisande* and *Estampe* as well as Ravel's *Gaspard de la Nuit* from his professor of harmony, Jehan de Gibon.
- 1919** – Moves to Paris and enters the Conservatoire.
- 1924** – Gains the second prize in harmony with Jean Gallon. Begins studies in improvisation with Dupré.<sup>52</sup>
- 1926** – Wins first prize in counterpoint and fugue with Georges Causaade.
- 1927** – Wins first prize in piano accompanying with C. A. Estyle. Death of his mother on August 26.
- 1928** – Gains first prize for history of music with Maurice Emmanuel for his explorations of the modal cultures of India and the East. Takes a course in Greek meter.<sup>53</sup>
- 1929** – First prize in organ playing and improvisation with Dupré. Dupré taught Messiaen to improvise on Greek rhythms, and plainchant as well as the importance of registration in improvisation.<sup>54</sup>
- 1930** – First prize in composition with Paul Dukas. Leaves the conservatoire.
- 1931** – Accepts the position at La Trinité becoming at age 23 the youngest titular in France. Debuts as a composer with *Les offrandes oubliées*.
- 1932** – Marries Claire Delbos.
- 1936** – Begins teaching at the Schola Cantorum and Ecole Normale de Musique. Founds La Jeune France along with André Jolivet, Daniel Lesur, and Yves Baudrier.
- 1939** – Called to military as medical auxiliary.

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<sup>50</sup> Taken primarily from Peter Hill *The Messiaen Companion* p. 530-535.

<sup>51</sup> Claude Samuel, "Music and Color: conversations with Claude Samuel" interview by Claude Samuel, trans. E. Thomas Glasow (Portland Or: Amadeus Press, 1994), 1.

<sup>52</sup> *Ibid.*, 22.

<sup>53</sup> *Ibid.*, 73.

<sup>54</sup> *Ibid.*, 111.

**1940** – Prisoner of war and interned at Görlitz in Silesia. It was during this time that Messiaen wrote one of his most well known pieces *Quatuor pour la fin du temps*.

**1941** – Released from prisoner of war status and becomes professor of harmony at Paris Conservatoire.

**1942** – Begins writing *Technique du mon langage musical*.

**1943** – Teaches private composition classes; students included Pierre Boulez, Yvonne Loriod, Maurice Le Roux, Yvette Grimaud.

**1947** – Appointed to analysis class at Paris conservatoire. Visits Budapest to teach and the United States for the performances of *Hymne du Saint Sacrement* and *L'Ascension*.

**1948** – Teaches at Tanglewood.

**1949** – Teaches at Darmstadt summer school.

**1959** – Death of his first wife.

**1961** – Marries pianist, composer, and student Yvonne Loriod.

**1966** – Appointed professor of composition at Paris Conservatoire.

**1967** – Elected member of the Institut de France.

**1971** – Wins Erasmus Prize.

**1978** – Retires from the Paris Conservatoire. First annual Messiaen Festival in Paris.

**1992** – Dies April 28.

## MAJOR INFLUENCES

Messiaen closes his preface to *The Technique of my Musical Language*:

I do not want to close this introduction without thanking: -- my masters: Jean and Noël Gallon, who stimulated in me the feeling for the “true” harmony, Marcel Dupré, who oriented me toward counterpoint and form, Paul Dukas, who taught me to develop, to orchestrate, to study the history of the musical language in a Spirit of humility and impartiality: -- those who influenced me: my mother (the Poetess Cécile Sauvage), my wife (Claire Delbos), Shakespeare, Cladel, Reverdy And Eluard, Hello and Dom Columba Marmion (shall I dare to speak of the Holy Books which contain the only *Truth?*), birds, Russian music, Debussy’s *Péleas et Mélisande*, plainchant, Hindu rhythmic, the mountains of Dauphiné, and finally, all that evokes stained-glass window and rainbow.<sup>55</sup>

Many of the persons and items that Messiaen mentioned greatly influenced his compositional style.

The artistic influences of Messiaen’s life were at work even at the time of his conception. His father was a professor of English had produced a well-known French translation of all of the works of Shakespeare.<sup>56</sup> During her pregnancy the poetess, Cécile Sauvage (Messiaen’s mother), wrote a set of twenty poems, *Lâme en bourgeon* about her unborn child. Later in life Messiaen cites this literary work as being a major and defining influence – perhaps even a “prophecy that he would be an artist.”<sup>57</sup> Messiaen drew this conclusion from one of Cecile’s writings, “ Je souffre d’un lointain musical que j’ignore [I suffer from an unknown, distant music]”.<sup>58</sup> Messiaen inherited a deep appreciation for the plays of Shakespeare from his father bragging, “all of which I recited before an

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<sup>55</sup> Olivier Messiaen, preface to *The Technique of my Musical Language*, trans. John Satterfield (Paris: Alphonse Leduc et Co, 1956), 8.

<sup>56</sup> Stuart Waumsley, *The Organ Music of Olivier Messiaen* (Paris: Alphonse Leduc et Co., 1968), 1.

<sup>57</sup> Paul Griffiths, *Olivier Messiaen and the Music of Time* (Ithaca, New York: Cornell University Press, 1985) 19.

<sup>58</sup> Samuel, 15.

audience of one – my brother – when I was between eight and ten years old.”<sup>59</sup> Although Messiaen shared a love of fine literary writing with his father, it was his mother’s poetry that influenced him the most. Messiaen penned all of the poetry used in his vocal works with the exception of one, which was written by his mother.<sup>60</sup> The title of his treatise *The Technique of my Musical Language* suggests the importance of language in his life -- music or literary.<sup>61</sup>

Religion greatly influenced Messiaen. In his works, the primary objective was to proclaim the theological truths of the Catholic faith. To which he was so deeply convicted.<sup>62</sup>

The first idea I wanted to express, the most important, is the existence of the truths of the Catholic faith. I have the good fortune to be a Catholic. I was born a believer, and the scriptures impressed me even as a child. The illumination of the theological truths of the Catholic faith is the first aspect of my work, the noblest, and no doubt the most useful and most valuable – perhaps the only one I won’t regret at the hour of my death.<sup>63</sup>

Most of Messiaen’s organ works find root in Christian theology whether in the title or the epitaph surrounding the work.<sup>64</sup> He expresses his desire to represent his faith in his music saying:

God for me is manifest, and my conception of sacred music derives from this conviction. God being present in all things, music dealing with theological subjects can and must be extremely carried. The Catholic religion is a real fair-story – with this difference, it is all true. I have therefore, in the words of Ernest

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<sup>59</sup> Samuel, 20.

<sup>60</sup> Singlind Bruhn ed., *Messiaen’s Language of Mystical Love*, vol. 2050, Garland Reference Library of the Humanities (New York: Garland, 1998), 215.

<sup>61</sup> Hill, 16.

<sup>62</sup> Roger Nichols, *Messiaen*, 2<sup>nd</sup> ed. (New York: Oxford University Press, 1986), 8.

<sup>63</sup> Jean Mongrédien, *French Music from the Enlightenment to Romanticism*, trans. Reinhard G. Pauly (Portland, Or: Amadeus Press, c1996), 20.

<sup>64</sup> Hill, 15.

Hello, tried to produce ‘a music that touches all things without ceasing to touch God’.<sup>65</sup>

Combining his love for the Catholic faith and his love for literature, Messiaen wrote a number of poems dedicated to his religion. One of them reads:

My Jesus, my silence,  
Remain within me.  
My Jesus, my realm of silence,  
Speak within me.  
My Jesus, night of rainbow and of silence,  
Pray within me.  
Sun of blood, of birds,  
My rainbow of love,  
Desert of love,  
Sing, radiate the aureole of love,  
My love,  
My love  
My God.  
This affirmation that sings like a luminous echo.  
Red and mauve melody in praise of the father,  
Your hand exceeds the picture of a kiss.  
Divine landscape, mirror yourself in the water.<sup>66</sup>

Within this poem two other major influences are observed: birds and color.

Messiaen began notating birdsongs in 1923 while visiting the Aube district of France. However, it was not until 1941 that he first used them systematically in a piece of music. That was the *Quatuor pour la fin du temps*.<sup>67</sup> In an interview with Claude Samuel, Messiaen says:

It’s probable that in the artistic hierarch, birds are the greatest musicians on our planet. The bird is indeed a marvelous creature from all points of view...But the greatest of all these marvels, the most precious for a composer of music, is obviously song. A bird’s song is something extraordinary.<sup>68</sup>

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<sup>65</sup> Waumsley, 10.

<sup>66</sup> Bruhn, 222.

<sup>67</sup> Hill, 249.

<sup>68</sup> Samuel, 85.

Another aspect important to Messiaen's music is that of color and stained glass. He often thinks of modes in colors. When his father taught in Paris, Messiaen often visited the churches of Notre Dame, the Sainte-Chapelle, and the cathedrals of Chartres and Bourges, all of which had an impact on his career.<sup>69</sup> Messiaen often refers to compositions, both his own and works of Debussy, Chopin, Wagner, and Mozart, in terms of color. The colors of the stained-glass windows which inspired him since childhood and their hues are instrumental in his music. Messiaen has this to say about his faculty for color hearing:

When I hear music – and it was already like that when I was a child – I see colours. Chords are expressed in terms of colours for me – for example, a yellowish orange with a reddish tinge. I'm convinced that one can convey this to the listening public.<sup>70</sup>

The modes<sup>71</sup> that Messiaen writes about in his *The Technique of my Musical Language* can also be described in color.

I'll give you a few examples of the colors of my modes. Mode 2 is thrice transposable, so it has three possibilities of coloration. For me, the first transposition of Mode 2 is defined like this: "blue-violet rocks speckled with little gray cubes, cobalt blue, deep Prussian blue, highlighted by a bit of violet-purple, bold, red, ruby, and stars of mauve, black, and white. Blue-violet is dominant." The same mode in its second transposition is totally different: "gold and silver spirals against a background of brown and ruby-red vertical stripes. Gold and brown are dominant." And here's the third transposition: "light green and prairie-green foliage, with specks of blue, silver, and reddish orange. Dominant is green."<sup>72</sup>

Aside from nature and poetry, there have been a number of composers and musicians who have influenced Messiaen. These influences began rather early in his life.

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<sup>69</sup> Samuel, 37.

<sup>70</sup> Hill, 203.

<sup>71</sup> For a brief description of the modes see the section *The Technique of My Musical Language: A Summary* p. 45. For a more complete explanation consult the actual treatise.

<sup>72</sup> Samuel, 64.

As a child, he would often request scores of operas such as *The Damnation of Faust* and *Don Giovanni*. Messiaen describes his first encounter with Debussy as being “a real bomb-shell...probably the most decisive influence of my life.”<sup>73</sup> It was a score of Debussy’s *Pelléas et Mélisande* given to him by Jehan de Gibon that sparked this passion. At the age of ten, Messiaen could not have comprehended the importance of this moment in his life later explaining it:

After the war we moved to Nantes and it was there that I met my first teacher, Jehan de Gibon. Who gave me as a present Debussy’s *Pelléas et Mélisande* an inconceivable thing in 1918 for a provincial teacher to give *Pelléas et Mélisande* to a ten year old boy! It was this score that decided my vocation.<sup>74</sup>

Throughout his life, Messiaen continued to admire Debussy as well as other French impressionistic composers. He speaks of the modes in his treatise *The Technique of my Musical Language* which were founded in composers from the French impressionistic genre. Messiaen’s next radical musical influence came from his studies at the conservatory where he encountered Dukas, Gallon and Dupré. Paul Dukas taught composition to Messiaen. He remembered of Dukas that “he developed in me a sense of artistic probity and gave me an orchestral technique of which I am, once more, very proud.”<sup>75</sup> Messiaen remembered Dukas’ opera *Ariane et Barbe-Bleue* for the way in which he masterfully combined colors of sound with orchestration.

I was a pupil of Paul Dukas, whose masterpiece, the opera *Ariane et Barbe-Bleue*, contains in the first act the amazing scene of the gemstones. Ariane successively opens doors, and out of each door rushes a stream of gems. The precious violet stones are amethysts; the precious red ones are rubies; the blue ones are sapphires; and the green stones are emeralds. Each stream of gemstones is represented by a variations in Ariane’s theme, in a particular orchestration and tonality. Thus

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<sup>73</sup> Nichols, 7.

<sup>74</sup> Waumsley, 7.

<sup>75</sup> Griffiths, 27.

Dukas was able to link orchestration and tonality to the color of the stones, and this correspondence struck me when I was eighteen.<sup>76</sup>

Gallon served as Messiaen's harmony, theory, and counterpoint teacher. However, Gallon's most important influence over Olivier was not what he taught but to whom he introduced the young Messiaen...Marcel Dupré. Gallon sent Messiaen to Dupré in order to study improvisation because he sensed that Messiaen had a gift for it.<sup>77</sup> Dupré had a number of influences over Messiaen; plainchant, registration, improvisation, and organ technique. All of these influences are extremely important in the understanding of Messiaen's organ music; however, none so much as Dupré who taught him most importantly about the instrument, its peculiarities, and registration.

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<sup>76</sup> Samuel, 167.

<sup>77</sup> Griffiths, 26.

## THE TECHNIQUE OF MY MUSICAL LANGUAGE: A SUMMARY

When discussing Messiaen's harmonic language perhaps the most invaluable source of information, and perhaps the only one of true pertinence is *The Technique of my Musical Language*. Messiaen wrote this treatise for the purposes of his students, "in the hope that my [Messiaen's] students will return to the few ideas that I am going to develop – whether to use them better than I, or to draw something else from them, or to reject them ultimately if the future proves them unlikely to live."<sup>78</sup> The goal of this theory is not to teach composition but as Messiaen writes, "I draft my treatise by taking the reader's hand, searching with him, in the darkness where I have hoped guiding him gently toward a restrained light, preparatory to a better understanding which he will be able to find afterwards."<sup>79</sup> Messiaen's writing is an insight into his inspiration and his language – that of the composition.

"*The Technique of My Musical Language*, language considered from the triple point of view, rhythmic, melodic and harmonic."<sup>80</sup> It will suffice to say that Messiaen's rhythms were deeply influenced by rāgavardhana, Hindu rhythm, ametrical music, and the possibilities of additive and diminished rhythms. Another aspect vital to Messiaen's music that does not directly affect his harmonic language is the affinity for bird songs. The latter of the two subjects: melodic and harmonic, will be discussed at length as part of this summary.

Messiaen writes:

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<sup>78</sup> Olivier Messiaen, *The Technique of my Musical Language*, 8.

<sup>79</sup> Ibid.

<sup>80</sup> Ibid.

Supremacy to melody! The noblest element of music, may melody be the principle aim of our investigations. Let us always work melodically; rhythm remains pliant and gives precedence to melodic development, the harmony chosen being the 'trúe', that is to say, wanted by the melody and the outcome of it.<sup>81</sup>

Messiaen begins with a discussion of intervals. There are three intervals discussed at length; the tritone, the descending major sixth, and returning chromaticisms (shown in examples 70-74 pg. 48). In his discussion of the tritone Messiaen abates the typical resolution of the fi-sol movement and instructs instead that fi should be resolved to do, as it is part of the natural overtone series. For example, in the key of C an F# would normally want to resolve up the half step to G however, Messiaen instructs that the F# would be best resolved to the C because it is the seventh partial of the overtone series and "a fine ear clearly perceives an F# in the natural resonance of a low C."<sup>82</sup> Messiaen gives equality to all the overtones as opposed to the importance traditionally attributed to only the first four upper partials of the overtone series. *Arc-en-ciel d'innocence* (example 90 pg. 48) in the chant of the soprano is a prime example of this type of resolution of the tritone.<sup>83</sup> Messiaen mentions the importance of the descending major sixth because of the added sixths present in the harmonies of Debussy, which were also adopted in his own harmonic language. He also points out that the descending major sixth was an important interval in Mozart's melodies, whom Messiaen hailed as the "great melodist".<sup>84</sup> The singing major sixths are best seen in the violins en sourdine in *Les Offrandes Oubliées* (example 91 pg. 48).<sup>85</sup> The concept of the returning chromaticism is best explained

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<sup>81</sup> Ibid., 31.

<sup>82</sup> Ibid.

<sup>83</sup> Olivier Messiaen, *The Technique of My Musical Language* vol. II (Paris: Alphonse Leduc, 1966) ex. 90, p. 14.

<sup>84</sup> Olivier Messiaen, *The Technique of My Musical Language* vol. I p. 31.

<sup>85</sup> Olivier Messiaen, *The Technique of My Musical Language* vol. II, ex. 91, p. 14.

through musical example such as the theme found in *Les Mages* (example 92 pg. 48) where the chromatic notes F#-G-G#-A-A# return continually throughout.<sup>86</sup> Messiaen then discusses the techniques of melodic development, primarily elimination of notes and inversion.<sup>87</sup>

Moving from melody to harmony one must keep in mind that “the harmony [is] chosen being the ‘true’, that is to say, wanted by the melody and the outcome of it.”<sup>88</sup> Messiaen’s harmonies are directly derived from his melodies. Central to his harmonic language is the concept of added notes, a characteristic trait learned from Debussy. The beauty of the added note chord is that the note of dissonance (the added note) is neither prepared for nor resolved however; even though they are foreign “they have, nevertheless, a certain citizenship in the chord, either because they have the same sonority as some classified appoggiatura, or because they issue from the resonance of the fundamental.”<sup>89</sup> Again, Messiaen is citing the importance of the naturalness of the overtone series with respect to dissonances and resolutions. The most commonly used of the added notes are those of the sixth and augmented fourth (tritone). These notes which may be added to the major, dominant, seventh, or ninth chords, may be added singly or together.<sup>90</sup> The harmonies created by added notes are central to Messiaen’s harmonic language. Examples of these can be found throughout his writing one of which can be found in *Combat de la Mort et de la Vie* (example 199 pg. 49) for organ.<sup>91</sup>

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<sup>86</sup> Olivier Messiaen, *The Technique of My Musical Language* Vol. II, ex. 92, pg 14.

<sup>87</sup> For further explanation see Chapter X of *The Technique of my Musical Language*.

<sup>88</sup> Olivier Messiaen, *The Technique of My Musical Language* pg. 31.

<sup>89</sup> *Ibid.*, 47.

<sup>90</sup> *Ibid.*, 47-49.

<sup>91</sup> Olivier Messiaen, *The Technique of My Musical Language* Vol. II, ex. 199, pg 36.

Messiaen dedicates the next chapter of his treatise to special chords, clusters of chords, and a list of connections of chords. The special chords are broken into three groups; the chord on the dominant, the chord of resonance, and the chord in fourths. The chord on the dominant is a chord constructed using every note of the major scale.<sup>92</sup> Chords on the dominant and their resolutions are shown in musical examples nos. 201-202 (pg. 49) from the second volume of *The Technique of my Musical Language*. This particular chord, like all others, may be enhanced through inversions or the addition of neighbor tones. The chord of resonance is founded in the overtone series – it is built on the foundation note and uses all of the upper partials.<sup>93</sup> It too may be inverted or ornamented. The third and final special chord is the chord in fourths. As the name implies, it is constructed using either perfect or augmented fourths or a combination of both.<sup>94</sup> If the chord is constructed using only perfect fourths, it is specifically referred to as a Tristan chord. The section on chord clusters is an in depth explanation of how Messiaen adapts the polytonal chords of Milhaud, Ravel, and Debussy into his harmonic language.<sup>95</sup>

*The Technique of my Musical Language* continues with various sets of chord progressions. Messiaen opens this sections reiterating the importance of melody and the natural (pertaining to the overtone series) harmony writing:

All these investigations ought not make us forget the natural harmony: the true, unique, voluptuously pretty by essence, willed by the melody, issued from it, pre-

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<sup>92</sup> Olivier Messiaen, *The Technique of My Musical Language* pg. 50.

<sup>93</sup> Ibid.

<sup>94</sup> Ibid., 51.

<sup>95</sup> For further reading consult pp 51-52 in the first volume and the accompanying musical examples from the second volume of *The Technique of my Musical Language*. This is best understood if the reader has a background in both tonal harmony and the harmony of the twentieth century.

existent in it, having always been enclosed in it, awaiting manifestation. My secret desire of enchanted gorgeousness in harmony has pushed me toward those swords of fire, those sudden stars, those flows of blue-orange lavas, those planets of turquoise, those violet shades, those garnets of long-haired arborescence, those wheelings of sounds and colors in a jumble of rainbows of which I have spoken with love in the Preface of my *Quatour pour la fin du Temps*; such a gushing out of chords should necessarily be filtered; it is the sacred instinct of the natural and true harmony which, alone, can so charge itself.<sup>96</sup>

Examples 230-245 (pg. 50) from volume two of *The Technique of my Musical Language* show a number of different harmonic progressions characteristic of Messiaen's compositions. In addition to these harmonies other characteristic traits are present in his works. These include; melodic fragments of two or more repeated notes with different harmonizations, various types of connections created by superpositioned perfect and augmented fourths and perfect and diminished fifths.<sup>97</sup> In order to completely understand Messiaen's harmonic progressions aside from numerous hours of musical score study, one must also grasp the concept of modes of limited transposition.

The theory of the modes of limited transpositions is as follows:

Based on our present chromatic system, a tempered system of twelve sounds, these modes are formed of several symmetrical groups, the last note of each group always being common with the first of the following group. At the end of a certain number of chromatic transpositions which varies with each mode, they are no longer transposable, the fourth transposition giving exactly the same notes as the second, etc... There are three modes of this type. There are four other modes, transposable six times, and presenting less interest, for the very reason of their too great number of transpositions. All the modes of limited transpositions can be used melodically, and especially harmonically, melody and harmonies never leaving the notes of the mode.<sup>98</sup>

Through these modes, the composer is able to create a work centered in several different tonalities, but not polytonal, with a central tonality or an unsettled tonality. The modes of

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<sup>96</sup> Ibid., 52.

<sup>97</sup> Ibid., 53.

<sup>98</sup> Ibid., 58.

limited transposition have nothing to do with the modal systems of India, China, Greece, or the ancient modes of the church and plainchant.<sup>99</sup> The first mode, which Messiaen is careful to use only when it can be concealed, is the whole tone scale. It is transposable twice. The second is transposable three times and is based on tri-chords built of a half step followed by a whole step (example 312 pg. 50). This mode is more commonly known as the octatonic scale which was used somewhat by Rimsky-Korsakov, Scriabin, Ravel, and Stravinsky.<sup>100</sup> Messiaen also provides a number of possible harmonizations for the mode as well as typical cadences.<sup>101</sup> The third mode of limited transposition is transposable four times. It is divided into three tetrachords constructed with a whole step followed by two half steps.<sup>102</sup> Modes four, five, six, and seven are transposable six times and are found less frequently in Messiaen's works as he found them boring. Also of special interest to Messiaen's harmonic language one should note that the second mode is similar to the diminished seventh chord in that it is transposable three times. The third mode shares that same quality with the augmented fifth chord. The limited modes of transposition are "in the atmosphere of several tonalities at once, without polytonality, the composer being free to give predominance to one of the tonalities or to leave the tonal impression unsettled."<sup>103</sup> These characteristics allow for a tonal indecision or for creating a tonal center in a major or minor tonality without leaving the mode. It is possible for the modes to modulate onto themselves or into a different mode. Like the major/minor system the modes may also borrow from themselves creating mode mixture. It is

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<sup>99</sup> Ibid., 59.

<sup>100</sup> Ibid.

<sup>101</sup> Again these may be referenced in the second volume of *The Technique of my Musical Language* beginning at example 312.

<sup>102</sup> Messiaen, *The Technique of My Musical Language*, 60.

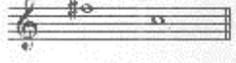
<sup>103</sup> Ibid., 64.

possible for the modes to be related to either tonal or atonal music. The modes may be superimposed in two or three modes or may be polymodal. The possibilities of the modes of limited transposition and their combinations are both unlimited in their possibilities and completely integral to Messiaen as a composer.

Musical Examples from *The Technique of my Musical Language*<sup>104</sup>

70 

71 

72 

73 

74 

90 **Un peu lent**  
*Arc-en-ciel d'innocence*  
Chant  
Soprano  
le so- leil t'é- cri - ra sur l'épa- le du ma- tin — pour lancer des ai- seaux

91 **Extrêmement lent**  
*les Offrandes oubliées*  
Violons en sourdine  
*f* — *p*

92 **Rêveur et très modéré**  
*les Mages*

<sup>104</sup> All musical examples in this section are taken from the vol. II of *The Technique of my Musical Language*.

199

Combat de la Mort  
et de la Vie

Extrêmement lent, tendre, serein

G. (fl. harm.)

mf legato

Orgue

R. (unda mortis, solilo.)

pp legato

Péd. (bouréons 1 et 2, (tr. R.))

pp legato

Pos. (fl. harm.)

mf

B.

A.L. 20,227

201

202

235

236 *Lent*  
*dououreux, en plourant*  
*ff Legato*  
*Amen de l'agonie de Jesus*

237 *ppp*

238

239

240

241 *Vocalise, pour l'Ange qui annonce la fin du Temps*

242 *ppp*

243 *Vocalise, pour l'Ange qui annonce la fin du Temps*

244 *Presque lent*  
*Toi vois*  
 (mode 3) (mode 8)  
 A (mode 2) B (mode 2)  
*mf*

245 *Presque lent*  
*Toi vois*  
 1<sup>er</sup> terme 2<sup>e</sup> terme  
*mf*

312 *Mode 2, 1<sup>re</sup> transposition*

## OPTICAL ILLUSIONS AND AURAL REALITIES

Messiaen's music is an aural art not a visual exercise in analysis. In order to completely understand the harmonic language employed in his organ works, one must be completely aware of how the overtone series, as it pertains to organ building, affects the music. Messiaen was one of the first, and perhaps the only, composer who understood how to utilize the mutations of the organ to the greatest effect. Therefore, his registration choices, which are often referred to as a matter of orchestration or timbre, drastically affect the aural perception of the harmonies. Taking into account his strong background in theory and organ, as well as the stops that are unique to the instrument at La Trinité, and his directions for registration, it will be shown how Messiaen's harmonic language appears on the written score and how it is perceived are completely different.

Messiaen had a deeper understanding of the overtone series and registration than did most composers. In *The Technique of my Musical Language*, Messiaen addresses the natural resolution of a note.<sup>105</sup> The natural resolution of a note relies heavily on the overtone series. For example, in the key of C, an F# would resolve to the tonic. This is not a traditional resolution in that fi (a raised fourth) would usually resolve to sol. Messiaen explains that a sharp four is the tenth partial to the fundamental. Messiaen was keenly aware of the overtones present in organs and exploited them through registration.

His knowledge of the overtone series and how to use them in compositions is supported by his conversations with Claude Samuel.

...I was an organist by profession. You know there are three families of timbres in an organ: foundation stops, reeds, and mixtures. The foundations stops are, properly speaking, the genuine organ timbre, a flutelike timbre, if you will; the reeds are trumpet timbres, a brassy timbre; but the third family is unique to the

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<sup>105</sup> Refer to the summary of the treatise found earlier in the paper (pp. 41 – 50).

organ and exists nowhere else – these are the mixtures, single mutation stops or compounds. Mixtures are essentially stops producing tones other than those played, so when you play a middle C with the cornet stop, you hear, at the same time as that C, its octave, twelfth, fifteenth, and seventeenth. Now, those are the harmonics man has produced artificially by adding pipes to a pipe sounding the fundamental.

In the classics, these clusters of harmonics were always used with the fundamental sound. But, all the same, you’ll admit that it is a great temptation for a modern composer eager for change to eliminate the fundamental sound: that’s what I did. I used the organ mixtures with their false fifths, false thirds, false octaves, but without the fundamental notes, which created a fourth family, a family consisting only of harmonics, of artificial resonances.<sup>106</sup>

Because of the peculiar nature of each organ, Messiaen did not follow an active schedule of organ concerts. He felt it too difficult to continually familiarize himself with new consoles and the color of their stops and criticized the bland generic programs of those who did.

Because each organ is constructed along a certain line, on a specific model, and whenever I sit down at an unfamiliar console, I need ten days or so to acquaint myself with the timbres of the different stops and the position of the keyboards and of the pedal couplers. Having to familiarize myself with all these elements is difficult and takes me time. Changing organs is much more complicated than driving an unfamiliar car.

I have many organist colleagues who go on tour abroad with all-purpose programs; they choose some classics that don’t require much adjustment of the registration...<sup>107</sup>

Just as Messiaen did not actively tour as an organist, he also admits that his works are not suited for that purpose either. His registrations, which are integral to the harmonic language, are not possible on all instruments. He explains the situation in response to the question, “Can your music be played on any organs?”

No. It requires large instruments that possess varied timbres and mixtures and, particularly, those that have sixteen-foot stops on the manuals. Today, you know, it’s fashionable to rebuild organs in the Baroque style. The electric combinations are taken out on the pretext of authenticity, and one is deprived of

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<sup>106</sup> Samuel, 56.

<sup>107</sup> Ibid., 23.

an extremely useful asset; the sixteen-foot flue stops on the manuals are removed because they didn't exist in the Baroque era, and the tonal palette is completely destroyed. The number of mixtures is increased and the powerful reed stops eliminated for a romantic sound. Thus, you cannot play anything on the new instruments but Frescobaldi or Nicolas de Gringy, which is a bit restrictive after all! I love those composers – but even so, I want to be able to play other things. Obviously, my own music cannot be played on such organs, but there are still some large instruments in existence, and my organ music is often played anyway.<sup>108</sup>

In examining Messiaen's registrational techniques, one must note that Messiaen often eliminated the fundamental stops so that only the artificial harmonies of the mutations and mixtures were heard. Realizing that this was innovative Messiaen says:

I'll remind you that the organ possesses an extraordinary family of sonorities, namely the mixtures, which don't produce the real sounds played by the instrumentalist, but their harmonics, octaves, fifths, and thirds. The ancients used these artificial harmonics to illuminate timbres. For me, the temptation was strong to use these artificial harmonics without the real sounds. Thus I obtained new, quite strange material that already foreshadowed the sonorities of electronic music.<sup>109</sup>

Messiaen was constantly aware of the implications of this approach to registration. Thus, he carried the aural trickery of the organ mixtures over into his other compositions. He believed that the mixtures inspired his harmonic language. Speaking now of his harmonic language in general:

It's characterized first by the use of chords in clusters, deriving perhaps from the employment of organ mixtures...these chord clusters give my writing an aspect of precious stones, a shimmering, stained-glass texture that is rather characteristic.<sup>110</sup>

It is clear that Messiaen understood the organ and how the aural perception was affected. Through tracing the evolution of the instrument in an earlier chapter, one can begin to understand why the instrument at La Trinité seemed at one time out of place and

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<sup>108</sup> Ibid., 24.

<sup>109</sup> Ibid., 122.

<sup>110</sup> Ibid., 115.

strange.<sup>111</sup> Mutations and mixtures appeared on organs as early as the Praetorious organ dating from the early sixteenth century. However, it is important to note that organs were more similar than dissimilar. They all had principal, flute, and reed choruses as well as mutations and mixtures. The mutations primarily reinforced the fifth. It was not until the organs of the French classic era that it became standard to reinforce the third, but there were typically fewer mutations based on this partial. The organ at La Trinité, in comparison, had many more mixtures and mutations than was typical. Each manual had at least one mutation and one mixture. Messiaen had planned to have a septième 1 1/7' and a neuvième 8/9' added to the organ before his death. Both stops are rare and are not usually proposed in an organ specification. The plans for the addition of these mutations shows that Messiaen had plans for an even more exotic use of registrations as they would have no other use in choruses or registrations of any other composer's music. Aside from the fact that Messiaen's organ was loaded with mixtures one must also bear in mind the practices of registration prior to Messiaen. Even though the earlier instruments were equipped with mixtures and mutations, with the only exception being the French cornet, they were only used to reinforce the upper partials and add brightness and clarity to the fundamental. On occasion the nasard (2 2/3') would be used with an 8' for a solo effect. However, when combined in that manner it created the effect of an orchestral oboe rather than that of two separate pitches (the fundamental and the fifth). The other exception being the French cornet 8', 4', 2 2/3', 2', 1 3/5'. This was used primarily as a treble solo stop because in the upper range the pitches tend not to separate out. However, in the

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<sup>111</sup> Refer to the sections on Organ Registration in Theory and Practice (pp. 18 – 28) and The Organ at La Trinité (pp. 29 – 32) in order to examine the stoplists in a historical context.

lower ranges it becomes very easy to hear the five individual pitches. Messiaen was aware of the registrations of his predecessors and in some works such as *L'Ascension* used rather typical registrations. But, for the most part he relied heavily on eliminating the fundamental to create new harmonies.

The effects that the mutations have had on Messiaen's harmonic language can be seen in a number of his organ works. The mutations also create an optical illusion in that the voices as they are written on the page may be different from how they are aurally perceived. In analyzing his organ works, one cannot simply examine the written manuscripts. Registration and the overtones associated with registration must be taken into consideration. Example 1 illustrates the pedal line from *Le Banquet Céleste* measures 11-12 and 21-end. The registration for the pedal calls for flute 4', nazard 2 2/3', doublette 2', and piccolo 1'. The first excerpt shows the music as written, whereas, the second demonstrates how it is aurally perceived. First, one must understand that the pitches aurally perceived range from between one and three octaves higher than written. As a result of the registration, the bass is neither found in the pedal line, nor is the soprano found in the top. The bass actually is perceived from the bottom notes of the left hand and the soprano (melody) is in the pedal. The addition of the 16' bourdon in the récit in measure 12 maintains the bass in the manuals. In measures 21 to the end Messiaen experiments with different combinations of stops and their effects are shown below. It is not until the final measure that the aural perception of the score aligns with the visual.

Example 1 – as written measures 11-12<sup>112</sup>

This musical score shows three staves for measures 11 and 12. The top staff is in treble clef, the middle in bass clef, and the bottom in bass clef. The key signature has four sharps (F#, C#, G#, D#). The music consists of chords and melodic lines in all three parts.

Example 1 – pedal line as heard measures 11-12

This musical score shows two staves for measures 11 and 12. The top staff is in treble clef and the bottom in bass clef. The key signature has four sharps. The bottom staff features a dense, continuous texture of chords, representing the 'pedal line as heard'. Some notes in the bottom staff are marked with an 'x'.

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<sup>112</sup> Olivier Messiaen, *Le Banquet Céleste* (Paris: Alphonse Leduc), 2.

Example 1 – as written measures 21-end<sup>113</sup>

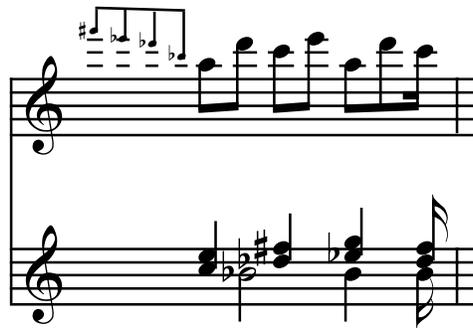
Example 1- pedal line as heard measures 21-end

Example 2 comes from the first measure of La Vierge et L'enfant from *La Nativité du Seigneur*. The first item shown is the actual score followed by how the melody is heard

<sup>113</sup> Ibid., 4.

and then how the accompanying chords are affected by the registration. The registration specified is quintaton 16', which is a stop that speaks one octave lower than is written but also has the overtone of a fifth overblown so that its presence is noticeable, flute 4', and nazard 2 2/3'. One notices that neither the melody nor the chords are heard in the octave in which they are written. The relatively consonant looking chords become dissonant and the melody is based on parallel perfect fifths.

Example 2 – as written <sup>114</sup>



Example 2 – top (solo) line as heard



<sup>114</sup> Olivier Messiaen, *La Nativité du Seigneur; Neuf Méditations pour orgue* Book 1 (Paris: Alphonse Leduc, 1936), 1.

Example 2 – chords as heard



Example 3 shows the aural perception of the pedal part from measure 16 from the same movement of *La Nativité du Seigneur*. The pedal, which is written as single notes is in reality parallel fifths and octaves. The registration of flute 4', nazard 2 2/3', tierce 1 3/5', and piccolo 1' also changes the aural perception of where the pedal is positioned. The pedal no longer providing the bass notes but rather the highest notes.

Example 3 – as written<sup>115</sup>



<sup>115</sup> Ibid., 2.

Example 3 – pedal line as heard

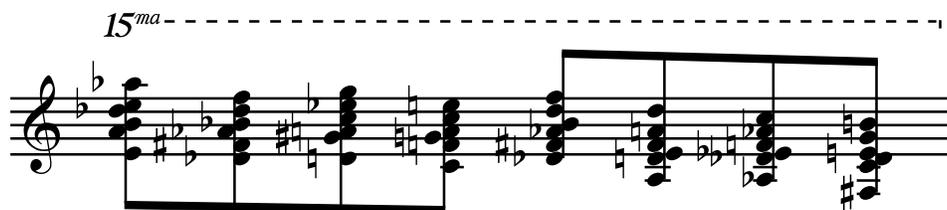


Les Bergers, the second movement of *La Nativité du Seigneur*, begins with the registration of flute 4' and nazard 2 2/3' for the top line of music. Although this does not change the aural concept of which voice is on top of the mixture it changes ones perception of the chords. Example 4 shows measure 1 first as it is written and then as it is heard. Notice that again the consonant chords are perceived as chord clusters of dissonances.

Example 4 – as written<sup>116</sup>



Example 4 – top line as heard



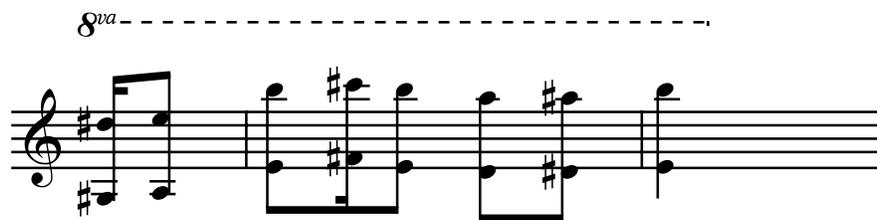
<sup>116</sup> Ibid., 5.

Measures 12-14 of the same piece has another example of contradiction. The registration here is for clarinette 8' and nazard 2 2/3'. The fundamental is present but in a different timbre than that of the fifth (example 5).

Example 5 – as written<sup>117</sup>



Example 5 – top line as heard



The quintaton 16' is used in conjunction with the cor de nuit 8' for the opening of the third movement of *La Nativité du Seigneur*; Desseins Éternels. Example 6 shows what

<sup>117</sup> Ibid., 6.

happens to the musical texture from measures 1-2. While the melody remains as written it is doubled at the octave and the fifth below.

Example 6 – as written<sup>118</sup>



Example 6 – melody line as heard



Musical examples 7-12 are all from various movements of *Les corps glorieux*. Les Eaux de la Grâce is the second movement. It begins with the registration of cor de nuit 8', nazard 2 2/3', and tierce 1 3/5' on the positif, which is written on the second line of the staff. It is written as one single line but sounds as parallel major triads (example 7). One should also note that the pedal is played on flute 4' so the pedal is heard in the middle of the texture. The middle line, which is played on the positif, becomes the bass.

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<sup>118</sup> Ibid., 10.

Example 7 – as written<sup>119</sup>

Example 7 – left hand part (middle staff) as heard

L'ange aux parfums begins with the same registration that Les Bergers, from *La Nativité du Seigneur* begins with, clarinette 8' and nazard 2 2/3'. The single line melody then is heard as is shown in example 8 using measures 1-2.

Example 8 – as written<sup>120</sup>

<sup>119</sup> Olivier Messiaen, *Les corps glorieux; Sept Visions brèves de la Vie des Ressuscités pour orgue*, Book 1 (Paris: Alphonse Leduc, 1942), 3.

<sup>120</sup> *Ibid.*, 7.

Example 8 – as heard



The registration in L'ange aux parfums changes in measure 24 to the quintaton 16' and cor de nuit 8' for the top line and flute 4' and cymbale for the pedal. Example 9 shows the chords that are achieved through the registration in the upper line of music. The registration of the pedal gives the pedal line a dual function. First, it still remains as the bass voice, and the cymbale which is built on upper partials of the octave and fifth will be heard throughout the texture as the top voice.

Example 9 – as written<sup>121</sup>



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<sup>121</sup> Ibid., 7.

Example 9 – top line as heard



A peculiar thing occurs in measure 28 (example 10) in the pedal part. As it is written, it might be overlooked as basic, but when it is heard, the pedal is the exact same pitches as the opening (example 8). The pedal is then heard in the middle of the chords.

Example 10 – as written<sup>122</sup>



Example 10 – pedal line as heard



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<sup>122</sup> Ibid., 8.

Joie et Clarté des corps glorieux begins with the melody soloed out on the French cornet along with the 16'.<sup>123</sup> Example 11 shows the pitches heard in measures 2-3.

Example 11 – as written<sup>124</sup>

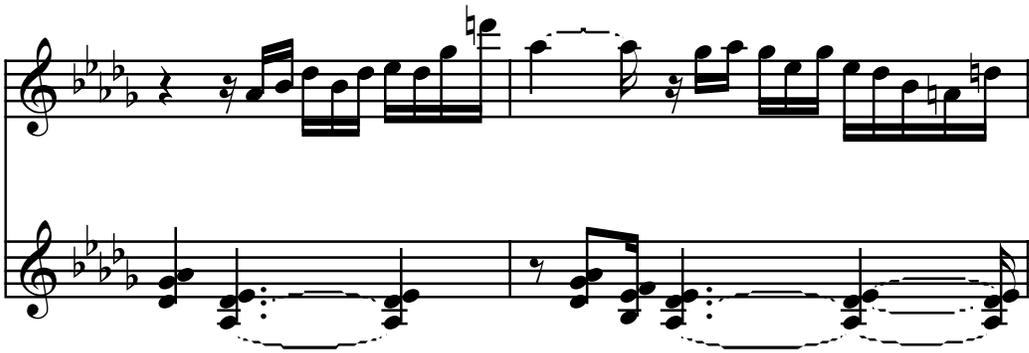
Example 11 – melody as heard

<sup>123</sup> 8', 4', 2 2/3', and 1 3/5'

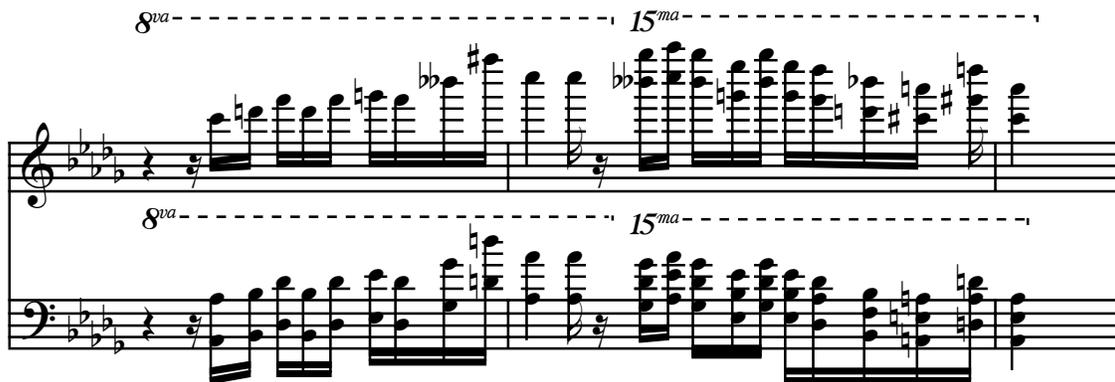
<sup>124</sup> Messiaen, *Les corps glorieux*, Book 3, pg 7.

Measures 24-26 of the same piece are shown in example 12. The registration for the melodic line is cromorne 8', bourdon 16', and tierce 1 3/5' for measure 24 and the downbeat of 25 then it changes to hautbois 8', quintaton 16', tierce 1 3/5', and piccolo 1'. With the specified registration, the melody can be heard in the soprano as well as in the bass.

Example 12 – as written<sup>125</sup>



Example 12 – top line as heard



<sup>125</sup> Ibid., 9.

The next two examples come from two movements of *Livre d'orgue*. The second movement Pièce en trio, which employs a number of Hindu rhythms, is shown in example 13. The upper line, which is not shown in the example, is not heard in the octave written but rather at an octave above and an octave below. The left hand part is shown in the example.

Example 13 – as written<sup>126</sup>

Example 13 – middle line as heard

<sup>126</sup> Olivier Messiaen, *Livre d'orgue; Sept Pièces pour orgue*, (Paris: Alphonse Leduc, 1953), 5.

Example 14 shows measure 8 from Chants d'oiseaux. The melody which is written as a single voice with the registration of flute 4', nazard 2 2/3', and tierce 1 3/5' is heard as parallel major triads in open position.

Example 14 – as written<sup>127</sup>



Example 14 – as heard



The final examples are from *Méditations sur le mystère de la Sainte Trinité*. The first is an example of Messiaen's elimination of the fundamental pitch. It is registered for doublette 2', tierce 1 3/5', piccolo 1', and fourniture. Example 15 is measures 16-17 of Dieu est Saint. The example shows the pitches of the doublette, tierce, and piccolo, the pitches of the fourniture are based on the third and fifth but are not shown even though they are also heard.

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<sup>127</sup> Ibid., 13.

Example 15 – as written<sup>128</sup>



Example 15 – as heard



Later in the same movement the registration changes to the quintaton 16', flute 8', prestant 4', and tierce 1 3/5'. Measure 90, as shown in example 16, is another sample of how a single line is actually heard at multiple pitch levels.

Exmpale 16 – as written<sup>129</sup>



<sup>128</sup> Olivier Messiaen, *Méditations sur le mystère de la Sainte Trinité* (Paris: Alphonse Leduc, 1973), 17.

<sup>129</sup> *Ibid.*, 23.

Example 16 – as heard

The image shows a musical score for Example 16. It consists of two staves. The top staff is labeled '15ma' and contains a single melodic line. The bottom staff is also labeled '15ma' and contains a complex chordal accompaniment. The music is written in a key with one flat (B-flat) and a common time signature. The notation includes various rhythmic values and accidentals, illustrating the concept of 'as heard' registration.

Taking into account all of the musical examples shown above there are four alterations between that which is written and heard. The written line of music transforms from a single voice to that of parallel fifths, thirds, or triads or the simple tonal chords become very complex chord clusters. Examples 1, 2 (part 1), 5, 6, 8, 10, 12, and 13 are all written as single voices but when they are played using the specified registrations they are aurally perceived as parallel fifths (and in some cases octaves as well). Example 15 demonstrates a single voice perceived as parallel triads due to the registration. In some cases when both the quint and tierce stops are employed the effect on the ear is that of parallel triads though it too is written as a single line of music. Examples displaying this trait are 3, 7, 11, 14, and 16. There is also the issue of tonal chords or simple tri-chord clusters being heard as very complex chord clusters because of registration. In the second part of example 2 the chords on the middle staff may be visually analyzed and described very simply as: a Bb pedal point with an overall harmony of C7 with passing tones of Db and F#. When one considers the effects of the registration the chords become a bit more complex. Though they may still be thought of ‘tonally’ it is a bit more complicated to talk about the chords that are aurally perceived in a logical manner.

Those very simple chords and passing tones are heard as a CM7, followed by a Db with a raised third, Eb9, and finally a Gb with a raised third being played simultaneously with a d chord. The chords of example 4 experience a drastic change from the page to the ear as well. The chords, as they are written, on the page, may be analyzed as A, F#, {0,2,8}, F, F#, D, {0,3,8}, and f# half diminished 7. In a visual analysis it is very easy to label the chords tonally or as simple tri-chord clusters. The aural perception of the chords is as follows {0,1,3,5,8}, {0,1,3,5,8,9}, {0,1,2,5,7,8,}, {0,2,4,6,9}, {0,1,3,6,8,9,}, {0,1,5,t}, {0,1,3,5,8}, {0,1,2,4,6,9}. The pitches heard can no longer be described with out the use of twentieth century analysis techniques. Another testament to this is shown in example 9 which on the page appears to be {0,1,6,}, a, F#, {0,3,7}, {0,3,8,}, {0,3,7}. All of the chords are seen as having only three notes and can be analyzed as major, minor, or as a tri-chord. When the registration requirements are taken into consideration double the notes are heard and it is no longer possible to comprehend the notes with regards to tonal analysis. The chords heard are {0,1,2,5,6,7}, {0,1,2,5,8,t}, {0,1,3,5,8,9}, {0,1,3,5,8,9}, {0,1,2,3,5,8,9}, and {0,1,3,5,8,9}. One also notices that when the chord clusters are put into simple form some of them are just transpositions of others.

All of the given examples represent but a small portion of the importance of registration in Messiaen's organ works. As Messiaen composed from the viewpoint of both a theorist and composer I have taken the same approach to the analysis of his music. Through a historical survey of organs and registration practices, a look at Messiaen's organ, writings and quotes from the composer and an understanding of how his music is aurally perceived I have shown that registrations are key in the analysis of Messiaen's organ works. To simply analyze his music only from the written score without regard to

registration is to only understand half of the musical picture painted with the palette of registration.

## CONCLUSION

Messiaen's music is obviously not what it appears to be. At first glance, his harmonies may appear simple and relatively consonant for twentieth century music; however, that is the optical illusion. When one gains an understanding of the tonal design of an organ, the effect that various stops have on the music, and how that applies to the innovative registrations of Messiaen, the aural reality is that the harmonies are much more complex.

At times, the voices cross from the page to the ear and visual consonances become aural dissonances. Messiaen was drawn to the mutations and mixtures of the organ. The stops which were typically used to reinforce the natural overtones of the fundamental pitches were used by themselves in Messiaen's registrations. The fundamental pitches were eliminated leaving only the thirds, fifths and octaves to speak in a new harmony. Because of the registrations Messiaen chose to use the harmonies that were presented in the score are not what the listener was apt to hear. The mixtures and mutations caused relatively consonant and tonal looking chords to become very dissonant and atonal chord clusters when experienced aurally. Simple single voice lines were heard as parallel fifths, thirds, or triads depending on the specified registrations. Visually simple music, when registered the way Messiaen intended, becomes a very complex swirling of color and sound.

It is evident that Messiaen understood the organ as a performer, composer, and theorist – understanding the overtone series, the fundamental and non-unison pitches built into the instrument, and the traditions of his forefathers. Messiaen challenged traditional registration and the effect achieved is his musical language. The optical illusion of

simplicity is the aural reality of the intricate harmonic layout of Olivier Messiaen's organ works.

## APPENDIX A

### Concise List of Organ Terms<sup>130</sup>

#### **Manuals**

##### Great

Hauptwerk (German)

Grand Orgue (French)

Hoofdwerk or Groot (Dutch)

##### Swell

Oberwerk, Brustwer, Schwellwerk (German)

Récit (French)

Bovenwerk, Borstwerk, or Schwellwerk (Dutch)

##### Choir/Positive

Positiv or Rückpositiv (German)

Positif (French)

Positief or Rugwerk (Dutch)

#### **Stop Names**

##### Principals

Principal

Open Diapason

Prestant

Montre

Octave

Twelfth

Super Octave

Fifteenth

Quint

Mixture

##### Strings

Salicional

Voix Céleste

Gambe

Viola de Gambe

Viola de Gambe

Violin

Cello

Salicet

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<sup>130</sup> Taken from Roger E. Davis *The Organists' Manual* Appendix B, which provides very comprehensive descriptions if further information is desired.

Fugara  
Geigen  
Violin Diapason  
Violone

Flutes

Hohlflöte  
Nachhorn  
Flûte Ouverte  
Flûte Triangulaire  
Flautino  
Spitzflöte  
Spire Flute  
Blockflöte  
Flachflöte  
Flauto Dolce  
Flûte Harmonique  
Concert Flute  
Querflöte  
Flauto Traverso  
Piccolo  
Gedackt  
Bourdon  
Stopped Diapason  
Nason Flute  
Quintadena  
Subbass  
Rohrflöte  
Chimney Flute  
Koppelflöte  
Spillflöte  
Kegelpijp

Reeds

Trumpet  
Trompette  
Tromba  
Trompet  
Bombarde  
Tuba  
Schalmei  
Oboe  
Hautbois  
Clarion  
Clairon  
Trombone

Posuane  
Bazuin  
Fagot  
Clarinet  
French Horn  
English Horn  
Cor Anglais  
Bassoon  
Orchestral Oboe (8', 2 2/3')  
Krummhorn

Mutations

Nazard  
Nasard  
Larigot  
Tierce  
Cornet (8', 4', 2 2/3', 2', 1 3/5')  
Sesquialtera (8', 2 2/3', 1 3/5', opt. 4', 2')  
Tertian (1 3/5', 1 1/3')

Mixtures

Mixture  
Fourniture  
Plein-Jeu  
Scharf  
Cymbel  
Tertz-Cymbel  
Carillon

## APPENDIX B

### Complete List of Organ Works

*Esquisse modale*

*Le banquet Céleste*

*L'hôte aimable des âmes*

*Variations écossaises*

*Diptyque*

*Apparition de l'église éternelle*

*L'Ascension*

*La Nativité du Seigneur*

*Les corps glorieux*

*Messe de la Pentecôte*

*Livre d'orgue*

*Méditations sur le mystère de la Sainte Trinité*

*Livre du Saint Sacrement*

## APPENDIX C

### Discography

The recordings of Messiaen's complete organ works:

- 1) Jennifer Bate  
Unicorn-Kanchana 9005/9024/9025/9028/9067/9068. The Organ Music of Olivier Messiaen.
- 2) Hans-Ola Ericsson  
BIS 409/410/441/442/464/491/492. The Complete Organ Music.  
Recorded in 1987 on the Grönlund Organ of Lulea Cathedra, Sweden.
- 3) Olivier Messiaen  
EMI (mono) CZS7 67400 2 (ADD); Organ Works. Recorded in 1956 on the Cavaillé-Coll organ of the Trinité, Paris.
- 4) Gillian Weir  
Collins 70312. Complete Organ Works of Messiaen

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