

Sacred Colour

An analysis of Olivier Messiaen's
musique colorée

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Project elective

Introduction

I have been interested in searching for the pictorial in music because I associate most pitches with a colour – for example, C to green, F to pink or E to red. Messiaen's compositional process offers a unique insight into this field because he “links” specific sound complexes to colour complexes and uses them “in full knowledge of this, juxtaposing them and putting them in relief against each other, as a painter underlines one colour with its complementary.”¹ Furthermore, I sympathize with the concept of coloured music because I have an affiliation with painting.

Bryce Canyon et les rochers rouge-orange is the seventh movement of *Des Canyons aux étoiles* (1974), a twelve movement piece inspired on the visual and sound worlds of the Canyons in Utah. The project starts by looking at how Messiaen's visual experience of the canyons is reflected through his compositional technique. However, as my research develops, it progressively becomes clearer that Messiaen's intentions weren't simply to reflect the landscape in a programmatic manner, but to bring us closer to God through the music that this landscape inspired him to compose.

In the first analytical part of the project (sections 1 and 2), the methodology consists in comparing the pitch material to Messiaen's special chord tables and colour modes, all of them listed in the seventh volume of his *Traité de Rythme, de Couleur, et d'Ornithologie*² – where he, as a synaesthetic composer, meticulously described the photisms that correspond to each set of sounds – finding the colour structure that defines the piece and charting the colour changes over time. The aim of these two sections is to find out the role of colour in Messiaen's compositional process in this particular instance, and what it tells us about the impression that the nature of the Canyons made on him, complemented by some quotes where he talks about the landscape.

In *Messiaen's Synaesthesia: The Correspondence between Colour and Sound Structure in His Music*³, Jonathan W. Bernard acknowledges that even though an explanation for Messiaen's sound-colour associations hasn't been found (for example, why is E major red?), the fact that his correspondences were “firmly fixed” should allow us to deduce the meaning behind this codified

¹ Claude Samuel, *Conversations with Olivier Messiaen*, (Paris, Belfond 1967, English translation: Stainer & Bell Ltd, 1976) p. 17

² Olivier Messiaen, *Traité de Rythme, de Couleur, et d'Ornithologie (1949-1992) en Sept Tomes, Tome VII* (Alphonse Leduc, Paris, 2002)

³ Jonathan W. Bernard *Messiaen's Synaesthesia: The Correspondence between Colour and Sound Structure in His Music*, *Music Perception*, 4:1 (Fall 1986)

language, which I will attempt to do with *Bryce* in section 3. Bernard mentions Messiaen's description of the fifth piece of *Sept Haikai* (1962): “the green of the Japanese pines, the white and gold of the Shinto temple, the blue of the sea, and the red of the *Torii*... That's what I wanted to translate almost literally into my music”. This suggests a bidirectional synaesthesia – although this is unusual. It is more likely, as Bernard points out, that Messiaen's solidification of his harmonic tools allowed him to “paint” what he saw, rather than involuntarily hearing sound complexes when being dazzled by the colours of the landscape and writing them down. This could be the case in *Bryce*: Messiaen painting the landscape to dazzle the spectator.

Bernard's article mostly deals with the identification and comparison of the colour modes, whereas in this project the core of the music is built on colour chords (a small portion of *Bryce* is consistently in one colour mode). In contrast to Bernard, I have been able to refer to Messiaen's *Traité VII* (2002), which hadn't been published at the time of his article (1986), and I have also used Wai-Ling Cheong's chord tables from her article *Rediscovering Messiaen's Invented Chords*⁴ (2003) to recognize the pitch content in *Bryce*.

At the back of the project (section 7) there is an analytical table for *Bryce* – which decodes the colours of the music as they “appear” in the score – which serves as a framework for the exploration in sections 1 and 2. The job of decoding the harmonies and modes that correspond to those presented by the composer in *Traité VII* is somewhat tedious and slow – a suggestion for future research could be to adapt a digital score programme to recognize and match Messiaen's PC sets with the chords and modes presented in *Traité VII* (which as far as I know there isn't one).

After this more analytical approach to coloured music, the following sections of the project zoom out and will try to explain the idea that the final aim of the work (and of Messiaen's coloured music in general) is not only to reproduce the location in musical terms through his unique and personal compositional technique (which anyway with respect to colour no one else, even a synaesthetic, could probably see in exactly the same way as Messiaen did) but its final aim is to move the listener to a state of enlightenment, which Messiaen perceives as a dazzlement by an Excess of Truth. Messiaen is trying to recreate for the listener the presence of God that he witnessed under the “sublime” impression of Bryce Canyons (as will be explained in section 5, according to Kant associates the experience of the sublime can be explained in terms of the Divine). This part is based on Sander Van Maas' interpretation of enlightenment in his work *The reinvention of religious*

⁴ Wei-ling Cheong, *Rediscovering Messiaen's Invented Chords*, *Acta Musicologica*, Vol. 75, Fasc. 1 (International Musicological Society, 2003), pp. 85-105

*music: Olivier Messiaen's breakthrough towards the beyond*⁵, and his article *Forms of love: Messiaen's aesthetics of "éblouissement"*⁶, where the analysis is elevated to a theological level. This study finishes by discussing the impossibility of experiencing *éblouissement* for a listener different than the composer himself.

⁵ Sander Van Maas, *The Reinvention of Religious music: Olivier Messiaen's breakthrough towards the beyond*, (Fordham University Press, USA, 2009)

⁶ Sander Van Maas in *Messiaen Studies* (Ed Robert Sholl), *Forms of love: Messiaen's aesthetics of "éblouissement"*, Sholl (Cambridge University Press, 2007), pp. 78-100

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1. Chromatism in *Bryce*: colour as a structural element

In an interview by Harriet Watts⁷, Messiaen explains the origins of the work. It was commissioned by the American singer Alice Tully in honour of the United States. Messiaen looked in all of his geography books, apparently over 7000⁸, in search for one of the most beautiful places in world. Consequently he decided to go to the canyons in Utah and in the spring of 1973 he spent eight days there with his wife transcribing birdsong, composing, taking pictures, walking and enjoying the view. He describes the landscape and birds of Bryce Canyons as follows:

...first, it's so big, immense, it's a landscape of nothing but cliffs and boulders in fantastic shapes. There are castles, towers, dungeons, there are turrets, bridges, towers, windows, and then, even more beautiful, there are the colours. Everything is red, all sorts of reds: red-violets, a red-orange, rose, dark red carmine, scarlet red, all possible varieties of red, an extraordinary beauty. I observed all of this very carefully, I wrote it all down, notation after notation.(...) And then there were the birds of Bryce Canyon, birds not to be found anywhere else but there, for example, the western tanager [tangara de l'ouest], a little bird which is red and yellow with a lovely voice, very flute-like which sings a combination of three notes (tiot, tiot, tiot). Then there is a very large bird which is called a blue grouse [geai bleu de steller], which goes "wuh, wuh, wuh", a strange deep sound which really fascinated me.(...)Bryce Canyon was of special interest to me. That's because it had all those colours, and I wanted to put them into music. So, the piece I composed about Bryce Canyon is red and orange, the colour of the cliffs.⁹

On a large scale, the movement has the form of a triadic ancient Greek ode, which Messiaen

⁷ Olivier Messiaen and Harriet Watts, *Canyons, Colours and Birds: An Interview with Olivier Messiaen*, *Tempo*, New Series, No. 128 (Cambridge University Press, March 1979), pp. 2-8

⁸ Ibid. [7] p. 3

⁹ Ibid. [7] p. 4

had already used in earlier works¹⁰. The strophe is formed by a piano cadenza imitating the *merle noir a tête jaune* (A1), an orchestral section also in the style of birdsong (B), a piano cadenza imitating the *troupiale de Scott* (A2) and a longer orchestral section (C) where the main theme is *les rochers rouge orange*. This is repeated and expanded three times (strophe, first antistrophe and second antistrophe – as Messiaen describes in the preface to the score) before giving way to the Epode (A3-D-A3-D-A3-D) where many birds come together and final coda (E-C) where Messiaen also includes a plainchant section. One of the most striking features of the movement is the presence of the E major chord and of mode 3(1) in the recurring C sections – in which this triad is the upper part of one of the chords – they play a unifying and centering role throughout. Messiaen described E major as red¹¹ and mode 3(1) as orange, gold and milky white¹², colours which are clearly linked to the red-orange rocks of Bryce.

Diagram 1.

Scoring, section	Technique	No. of bars
Strophe		
Piano solo, A1	Birdsong	8
Orch, B1-B4	Birdsong (B1-B3)	11
Piano solo, A2	Birdsong	7
Orch, C1-C3 C4 C5-C8	'Colour music' Rhythmic theme Combination of rhythmic material and some colour chords/modes	83
Antistrophe I		
Piano solo, A1 ²	Birdsong	10

¹⁰ Messiaen adopts the structure of Greek choral odes in certain of his works, first seen in 'Le Chocard des alpes' from 'Catalogue d'oiseaux' (1956-8). 'Chronochromie' is structured in seven large sections which Messiaen labels introduction, strophe I, antistrophe I, strophe II, antistrophe II, épode and coda. And he describes the structure of specific movements from 'Des Canyons aux étoiles' (1971-4) in similar terms: both movements 5 ('Cedar Breaks et le don de la crainte') and movement 7 ('Bryce Canyon et les rochers rouge-orange') are organized into a strophe, two antistrophes, an épode and a coda. Jonathan Cross, *The Stravinsky Legacy* (Cambridge University Press, 1998) p. 153

¹¹ Messiaen, *Music and Colour*, pp. 148-149. See also: Messiaen, *Traité VII*, pp. 309-315 Jonathan Bernard claims that there "for Messiaen keys themselves do not have fixed color associations" (p. 48): *One can't really talk of an exact relationship between a key and a colour: that would be a rather naïve way of expressing oneself because. . . colours are complex and are linked to equally complex chords and sounds* (Samuel, 1976, p.23).

¹² *Nappe orange, avec des dessins d'or et de blanc laiteux, et quelques taches gris cendré (ces taches son piquetées de mauve ou de rouge, ou de vert). Dominante: orange, or et blanc laiteux.* Ibid [2] p.122

Orch, B1 ² -B4 ²	Birdsong	14
Piano solo, A2 ²	Birdsong	10
Orch, C1 ² -C8 ²	Same as corresponding previous section, extended+varied	93
Antistrophe II		
Piano solo, A1 ³	Birdsong	7
Orch, B1 ³ -B4 ³	Same as corresponding previous section, extended+varied	22
Piano solo, A2 ³	Birdsong	21

Diagram 2.

Epode		
Piano solo, A3	Colour chord	1
Orch, D1 D2 (C3) D3	Birdsong Colour music Modal	10
Piano solo, A3 ²	Colour chord	1
Orch D1 ² -D2 ² -D3 ²	Same as corresponding previous section, extended+varied	22
Piano solo, A3 ³	-	1
Orch, D1 ³ D4 D5 D4 ² -D5 ² D4 ³	Birdsong Modal Birdsong Same Modal	23
Piano solo, A4	Birdsong	68
Coda		
Orch, E C2□	Alleluia plainchant + Birdsong Colour music	48

In the piece there are three distinctive styles of writing: birdsong, colour music and the rhythmic theme. In the passages classified as colour music, the listener is allowed to concentrate on the harmonic content, which is emphasized by the chordal nature and tempo of these sections. As will be proved in section 2, all material of the colour music sections is drawn from *Traité VII*, where the corresponding colours of these sound complexes is revealed, hence the name for this

compositional style. Even though birdsong and the *thème rythmique*¹³ (C4) are sometimes harmonized with colour chords or written in a colour mode, they are not classifiable as colour music: these sections have quick irregular rhythms; in the case of birdsong its register is either very high or very low and the colours perceived by Messiaen are whitened or darkened respectively¹⁴ (reducing the colour) and the chordal content is often ambiguous; in the case of the rhythmic theme it isn't harmonized and its modal content is very ambiguous all of which would make it difficult (for Messiaen) to appreciate the colour (of the photism) given by the pitch content. Despite its contrary characteristics to colour music, C4 is firstly presented in 6(6) of white, black and blue hues and Messiaen's following addition of two A major triads suggests a general blue impression since he repeatedly associated A major to blue¹⁵.

C5 is a sequence of warm colour chords with lots of gold and yellow components, combined with major and minor triads. C6 is the rhythmic theme varied. In C7 (the end of this section is closer to *musique colorée* style, with more spacious chords) the E major triad returns and we come back to 3(1) with a pause on a Chord of Contracted Resonance¹⁶ (CCR¹) 10B carmine red, orange and black. Messiaen describes section C8 as polymodal, superposing modes 3(4) – orange with red stripes- and 6(2) – brown, red, orange and violet. The last four bars comprise a wide range of pitches and clusters – “doors and abysses of shadows” –, noise and silence. Section 2 will look into detail on small but substantial differences between the repeated sections in the strophe and antistrophes. Even though some of the chords are different, the general colour impression of the strophe and antistrophes is not affected.

Interestingly, Messiaen starts off the Epode at the other side of the vision spectrum with lots of violet tones. Violet is also the resultant mix of red, the colour of the Canyons, and blue, the starry sky. Messiaen uses modes 4(6), 3(2) – also containing an E major triad –, CCR¹ 8A, Chord of Transposable Inversions (CTI) 11A, among others, which are recurrent throughout this last section of the piece, where the triadic form of the first section (strophe, first antistrophe and second antistrophe) is imitated at a smaller scale, with one very short interrupting piano cadenza (A3) and

¹³ As Messiaen calls it in the preface to the score for *Des Canyons aux étoiles*.

¹⁴ Ibid. [2] p. 97

¹⁵ Olivier Messiaen, *Conférence de Kyoto*, (Paris: Alphonse Leduc, 1988), 8; Messiaen, *Musique et couleur: nouveau entretiens avec Claude Samuel* (Paris: Pierre Belfond, 1986), 69; Messiaen, *Traité III*, 87; V/1, 354.

¹⁶ *1er Accord à résonance contractée* from *Traité VII*, pp. 157-164.

The following abbreviations will be used for Messiaen's special chords from *Traité VII: Accord à renversements transposés sur la même note de basse* – Chord of Transposable Inversions (CTI), *1er Accord à résonance contractée* and *2e Accord à résonance contractée* – Chords of Contracted Resonance (CCR¹, CCR² – the latter not used in *Bryce*), *Accords Tournants* – Turning Chords (TC)

an orchestral section (D) repeated and expanded three times.

The last piano solo (A4) is the longest and Messiaen treats the following material as a coda section where all the reds and oranges come back¹⁷.

Overall, the sections that most strongly colour the strophe, antistrophes and coda tend towards reds and oranges (given the dominant presence of the E major triad and the recurrence of mode 3(1) – more detail on how the colour content develops and the violet tones come into play will be given in the following section), and in the Epode (see table in section 6 for more detail) the colour impression tends towards violets (CTI 11A, TC 1C, CCR's 9AB), pinks (CCR¹ 8A), purples and mauves (CTI 11A, CCR¹ 8A), all contained by mode 4(6) – in D3.

So far, the three colours of structural importance that I have mentioned are red, orange (resultant colour when mixing yellow and red) and violet, all of which Messiaen names in the third quote at the beginning of the movement (which will be discussed in section 3):

Les assises du rempart sont rehausées de pierreries: la sixième assise est de corail (rouge), la neuvième de topaze (jaune orange), la douzième d'améthyste (violette)" - Apocalypse de Saint Jean_ ch. 21, v. 19_20.

¹⁷ Ibid. [13]

2. Coloured music: *les rochers rouge-orange*

The red-orange rocks are the central inspiration for the orchestral **C1**, **C2** and **C3** sections which are written in *musique colorée* style. The first thing that interests me here is which colours exactly dazzled Messiaen's mind, which modes or chords he used and how precise they are. In the preface, he gives an overall view of the more solid coloured music sections (sections **C1**, **C2** and **C3** in my analysis):

Puis le thème massif de rochers rouge-orange par les Bois et Cuivres. Des accords à résonance contractée (rouge et orange), le mode trois 1 (orange et or), des accords à renversements transposés (jaune, orange, blanc et noir) rendent les couleurs de la pierre.

Here I have examined these sections as well as **C2²**, **C3²**, **C1³**, **C2³**, **D2** and **C2⁴** and have found that all chords are classifiable in *Traité VII*, that he creates a complex thread of chord and colour progressions and that these sections are consistently of a red base colour but with other interacting pigments.

In the slower chorale-like sections, such as **C3** (table below), the majority of the pitches are from mode 3(1):

PC ¹⁸	0	1	2	3	4	5	6	7	8	9	10	11
times	12	5	7	10	18	7	9	16	15	8	9	14

The pitches (in bold numbers above) that constitute mode 3(1) are: 0, 2, 3, 4, 6, 7, 8, 10 and 11. Therefore, 85% – i.e. 110x100/130 – of the pitches of this section belong to mode 3(1). PCs 4, 7, 8, 11 and 0 (i.e. E, G, G#, B, C) have the highest number of reoccurrences (18, 16, 15, 14 and 10 out of 130 respectively). This set of pitches comprises the E major and C major triads, both characteristic of mode 3(1), and is also contained within the augmented triad E-G#-C, which is four times transposable, also like mode 3(1). The same happens with **C3²**, where 82% of the pitches – up

18 PCs {0,1,..., 11} = C, C#, ..., B

to the chord from mode 3(4) – belong to 3(1).

This doesn't particularly support the idea that this section is entirely in mode 3(1), since this mode contains 75% of the pitches of the chromatic scale. However, if we look at this section vertically, we find CTIs, Turning Chords (TCs), CCRs, as well as solid sections in mode 3(1). The following tables show the vertical content of the music and the corresponding colourations. As will be discussed, the general red-orange impression develops and turns into a rich range of hues, where green and blue play an important role: green being the complementary colour of red, and blue (the colour of the sky, and the Geai Bleu de Steller about which Messiaen says in the preface to the score *lorsqu'il vole au dessus du Canyon, le bleu de son vol et le rouge des rochers ont la splendeur des vitraux gothiques*) that mixed with the reds of the rocks gives way to the violets of the *amethyst*.

Chord Tables

C1	
Woodwind CCR ¹ 4A + chromatic cluster in strings	CCR ¹ 4A: Blueish jade green, diamond, clear green *
CCR ¹ 4B	Ruby red, orange and deep yellow
CCR ¹ 4A	"
CCR ¹ 4B	
TC 5B (missing A)	Clear orange, gold, smoky brown, deep violet Dominant: Red and gold
TC 5A ¹⁹	Gold and black / pink. Dominant: Red and gold
E major	Red ²⁰
3(1) no 1 (X) ²¹ + string cluster	Orange cloth, with patterns of gold and milky white, and some spots of ash gray (spots are dotted with mauve or red, or green). Dominant: orange, gold and milky white.
E major	Red

C2

¹⁹ Most of the Turning Chords have two colour descriptions, one for the higher part of the chord and the other for the lower, separated by a “ / ” in the tables.

²⁰ Messiaen, *Music and Colour*, 148-149. See also Messiaen *Traité VII* pp. 309-315

²¹ These colours are especially dominant in the chords marked with an “X”.

3(1) no 1 (X)	See above
3(1) no 4 (X)	"
"	"
CCR ¹ 4B	Ruby red, orange and deep yellow
PCs: 0, 4, 5, 6, 8, 9, 10, 11 ²²	Not found
3(1) no 1 (X)	See above
3(1) no 9 (X)	"
PCs: 0, 1, 2, 3, 4, 6, 10	Not found
3(1) no 4	See above
CTI 5D	Pale green with yellow and mauve reflections *
CTI 7B	Oblique red and white stripes, on a pink background with black patterns
E major	Red

C3	
CTI 7D	Orange, red and brown, lemon yellow
CTI 5D + added A#	Pale green, with yellow and mauve reflections *
CTI 7B	Oblique red and white stripes, on a pink background with black patterns
E major	Red
CTI 7D	See above
CTI 5D + added A#	
CTI 7B	
E major	
3(1) no 4 (X)	Dominant: orange, gold and milky white
3(1) no 1 (X)	"
3(1) no 7	"
TC 5A	Gold and black / pink
TC 5B	Clear orange, gold, smoky brown, deep violet
TC 5C	Milky white, quartz pink / red and gold
CCR ¹ 4A	Blueish jade green, diamond, clear green *
CCR ¹ 4B	Ruby red, orange, deep yellow
TC 2A (inverted voicing?)	Gold and orange / blue violet or hyacinth
3(1) no 1 (X)	See above

²² Pitches that constitute this chord (0=C)

TC 9A	Yellow and pale green / yellow and turquoise blue *
E major	Red

Notice the contrast between the green colouration in the chords marked with “ * ”, and the general tendency of the passages towards red – for example, the green content of CCR¹ 4A before CCR¹ 4B or TC 9A before the final E major chord in C3. Messiaen often spoke about the relation between complementary colours to sound harmonics. In *Traité VII* Messiaen explains that “to comprehend the relation between sound and colour, two experiences are necessary [...] The first is a musical experience, touching the domains of vibrations and acoustics”²³. He gives an account of the harmonic series heard when playing a C² on the piano. “The second experience is visual and concerns both painters and musicians. It touches the domain of complementary colours. Take a white paper, and place a smaller paper of bright red [...]. If we watch continuously for a while the line of demarcation between the red and white, the precise place where the red ends will become more intense and more red, and after a moment it will glow and throw into the white a pale green light that will appear and disappear like electric discharges”.

Messiaen talks about colour harmonics in his interview with Harriet Watts²⁴: “So, If you have a note a fifth above a yellow note, you'll see a violet; if you have a fifth at blue, you'll see an orange. I have often carried these experiments with my students at the conservatory, they all thought I was crazy, but that is of no importance. I do it anyway because I am convinced of the results”. This suggests that he had tried to unify or rationalise his sound-colour correspondence, however there is no evidence that this “circle of fifths” logic governs his colour correspondence, probably because of his increasingly²⁵ strong synaesthetic condition which provoked an involuntary correspondence between sound complexes and colours²⁶.

At the end of C3² (see tables below) green is also present in CCR¹ 6B before the final chord from mode 6(2) which contains red (but also violet). Colouration will become intensified and

²³ Ibid. [2] p.102

²⁴ Ibid. [7] p.5

²⁵ *I think that I have always possessed this “sixth sense,” but I only became aware of it very gradually. At first, I had it without consciously realizing it. Then little by little, perhaps because of my encounter with the painter Blanc-Gatti, I became aware of what was happening in me. And then I ended by studying it, by studying myself, by codifying certain sound-color relationships that appeared more obvious to me, and even including them in my treatise. But that was not done in one day because it is, all the same, very specific and very delicate.* Messiaen, *Conférence de Kyoto*, 6.

²⁶ *When dealing with Messiaen's color names for sounds it is necessary to keep in mind that no external logic has operated to construct the system. [...] His synaesthesia, like the true form of the phenomenon in any affected individual, is involuntary, the pairings of colours with sounds out of his control.* Ibid. [3] p.44

enriched in the Antistrophes and Coda, but the tension between green and red is present throughout the *musique colorée* sections.

An interpretation of these sections as if they were a painting is possible. In C3 we find the complete progression of TCs 5ABC. As mentioned before, most of the TCs have two colour descriptions from high to low, plus an *effect colorée global* and a *dominante* description. In this case, the *effect colorée global* is: rich mantle or oriental carpet, on a brown and black background, with red, gold, orange and pink ramage. Its dominant description is: red and gold. This suggests Messiaen was able to zoom in or out of the music to get more or less detail in colouration. This is similar to the way impressionists painters used colour. Below, Monet's "Sunset" from the Grainstack series. One can come close to the picture and see all the smaller clashing brushstrokes of contrasting colours, or walk away and get the general impression of the image.



Another parallelism with colour in painting and the TCs is that to imitate the colours of the real world, as in 17th Century paintings for example, one needs to add other hues that at simple eye sight would be hard to identify. For instance, when painting a face, there will need to be a range of greens and blues on the fleshy colour of the skin. This shows how there are various possible levels of colour awareness, as there seems to be for Messiaen in the TCs (*dominante* and *couleur générale* are also described for the colour modes) and therefore likely in the *musique colorée* sections.

C1² is the same as C1 and C2² is a prolongation of C2 with the following added chords:

C2²	
First 5 chords are exactly the same as C2 – all from mode 3(1), and the next 2 chords are no 1 and 4, also from 3(1)	
CTI 11B	Lemon yellow, with red patches
CCR ¹ 12A (extra A#)	Clear violet hatched with green, pale blue, silvery gray and black
CCR ¹ 12B	Shiny gold, purple violet with white, gold and black patches
3(1) no. 4 (X)	See above
CTI 9A	Large orange zone, circled with green and pale blue
CTI 5D	Pale green, with yellow and mauve reflections *
CTI 7B	Oblique red and white stripes, on a pink background with black patterns
E major	Red

In C3², up to bar three, the chords stay the same. Then:

C3²	
3(4) no 1 (X) + added B and D	Background: large orange cloth, strongly striped with red, softly striped with blue. Blue, violet purple and silver branches - white lilies, tiger lilies with cinnabar red flowers with black dots – orange and blue fruits, orange and green fruits. Dominant: orange, red, with a little blue
3(4) no 4 (X) + added F	"
3(4) no 1 (X)	"
TC 2A ²⁷	Gold and orange/blue violet or hyacinth
TC 2B	Capuchin and orange red / clear Prussian blue towards white
TC 2C	Orange, red, brown and gray / orange yellow
CCR ¹ 7A	Mauve grey, orange, purple violet
CCR ¹ 7B	Lemon yellow, orange, petunia red mauve
CTI 2B + top C#	Red, gray and pale green stripes *
3(4) no 8	See above
3(4) no 4 (X)	"

²⁷ Note TCs 2ABC progression. *Effect coloré global*: Drawings of brown, violets, pale blue and gold flowers on an orange background. *Dominante*: orange

CCR ¹ 6B + added F	Cobalt blue, deep malachite green, diamond *
6(2) no 3 (incomplete)	General colour: leather and chocolate colour, with red orange zones, and deep violet – some pale gray and mauve clouds.

Notice the absence of a final E major triad in C3². Compared to Strophe's C1-C3, C1³-C3² increasingly contains more blues (and the chord from 3(4) which has a little blue is repeated three times), which mixed with the reappearing reds will give way to more violet tones.

In C1³ and C2³ there are two layers of music, one is C1 and C2 in the winds, and a variation of the material in the strings: *le thème des rochers rouge-orange est en canon rétrograde, entre les Bois et Cuivres d'une part, et les Cordes et crotales d'autre part*. In the strings we find the following chords:

C1 ³ – strings	
E major	Red
3(1) no 1 (X)	See above
E major	Red
TC 5A	Gold and black / pink. Dominant: red and gold
TC 5B	Clear orange, gold, smok brown, deep violet. Dominant: red and gold
CTI 8B	Drawings in white and gold spirals, on a carmine red and leather brown background
CTI 1C	Orange, with pale yellow, red and gold stripes
CTI 8B	See above
CTI 3C or 12B	In both cases contains violet and turquoise blue

These are the same as C1 backwards (also in retrograde rhythm). Notice the presence of pink in TC 5A, violet in TC 5B and violet in the last chord. The original C1 sequence of CCR's 4A and 4B is substituted (but then appears in C2³) in the strings and percussion by the last CTIs, which continue into:

C2 ³ – strings	
E Major	Red
CTI 7B	Oblique red and white stripes, on a pink background with black drawings
CTI 9B	Blueish green, with a bit of yellow and violet

TC 5C	Milky white, quartz pink / red and gold
CTI 3A with added top E	Mauve bluebells, on white and clear gray sails
CTI 1B	Large sapphire blue cloth, circled with less intense blues (blue fluorine, clear Chartres blue) and re-circled with violet
CCR ¹ 7B (voicing) added Eb	Lemon yellow, orange, petunia red mauve
CCR ¹ 7A (voicing)	Mauve gray, orange, purple violet
CCR ¹ 4B	Ruby red, orange, deep yellow
CCR ¹ 4A	Blueish jade green, diamond, clear green *
CCR ¹ 12A Extra A#, missing Db ²⁸	Clear violet hatched with green, pale blue, silvery gray and black
CCR ¹ 12B	Shiny gold, purple violet with white, gold and black patches

With respect to the winds, **C2³** is still in retrograde rhythm but it doesn't contain a retrograde row of chords (note that even though CCR¹ 12B contains a C major triad, **C2³** has lost direct reference to mode 3(1), which is originally present in **C2**). Notice the decay of the E major triad dominance. **C3²** already finishes with a chord from mode 6(2) that contains deep violet. **C1³** ends on a CTI with violet, and the ending CCR¹ 12B of **C2³** with purple violet leads to the violets and birdsongs of the Epode discussed in section 1 and shown in the analytical table in section 6.

All chords of **D2** are from mode 3(1)

C2⁴	
PCs: 0, 4, 5, 6, 8, 9, 10, 11	Not found
CTI 2B	Red, gray and pale green stripes
CTI 12B	Pink, mauve, purple violet and turquoise mosaïque
CTI 11B	Lemon yellow, with red patches
3(1) no 4 (X)	See above
PCs: 0, 2, 4, 6, 9, 10, 11	Not found
CTI 4B	White and gold
CTI 2B + added E	See above
3(2) no 7	General colour: horizontal stripes layered from bottom to top: deep gray, mauve, clear gray, and

²⁸ Ibid. [25]

	white with mauve and pale yellow reflections – with shiny golden letters of an unknown alphabet, and an amount of small red or blue arches, very tiny, very thin, almost invisible. Dominant: gray and mauve
CTI 6B	Emerald green, amethyst violet, and pale blue
CTI 7C	Oblique red and white stripes, on a pink background with black patterns
CTI 9D	Shades of blue; intense sapphire blue, translucent fluorine blue, lapis-lazuli blue mat, violet blue, and clear Chartres blue
PCs: 0, 1, 3, 5, 7, 8, 11	Not found
PCs: 0, 1, 3, 5, 7, 9, 11	Not found
3(1) no 7	See above
Cluster chord in the strings (missing Bb) CCR ¹ 12A in the woodwind and brass (added top B) ²⁹	- Clear violet hatched with green, pale blue, silverish gray and black *
Cluster chord in the the strings (missing F) CCR ¹ 12B in the woodwind and brass (added top B)	- Shiny yellow gold, purple violet with white, gold and black patches
Cluster chord with: CTI 12D in the woodwind and brass	- Gold shiny Sun, on very white snow
Cluster chord with: CTI 2B in the woodwind and brass	- Red, gray and pale green stripes
E Major	Red

These *musique colorée* sections have a homorhythmic texture that is mostly in eighth-note rhythm. However, particularly at the beginning or end of each passage, there are longer chords. These chords of at least a quarter-note length are: CCR¹ 4B (ruby red, orange and deep yellow), CCR¹ 4B, E major (red) and E major in C1; 3(1) n. 4 (orange, gold and milky white) and E major in C2; 3(1) n. 1 and E major in C3; C1 and C2 are repeated in the first antistrophe plus 3(1) n. 4, CTI 9A (large orange zone, circled with green and pale blue) and E major in C2²; 6(2) n. 3 (leather and chocolate colour, with red orange zones, and deep violet – some pale gray and mauve clouds) in C3² as well as those in C3; E major, E major, CTI 8B (drawings in white and gold spirals, on a carmine red and leather brown background) and CTI 8B at the same time as C1 in C1³; E major and TC 5C (milky white, quartz pink / red and gold) in C2³; CTI 6B (emerald green, amethyst violet, and pale blue), 3(1) n.7, CCR¹ 12A (clear violet hatched with green, pale blue, silverish gray and

²⁹ Note in C2⁴ on the CCR¹ 12AB a B added, maybe to resolve the previous A# added in all the previous CCR 12As.

black), CCR¹12B (shiny yellow gold, purple violet with white, gold and black patches) and E major in C2⁴. From this list it is clear that as the piece evolves a wider variety of colours become present, taking the place of the originally red/orange/yellow colouration of the strophe's *musique colorée* passages.

CTI 9A and CCR¹ 12A are two exceptions of long chords with a green component. All the other chords that contain green seem “passing” chords, almost like a “colour” anacrusis, such as the CCR¹ 4A in C1 (blueish jade green, diamond, clear green) or the CTI 5D in C2 (pale green with yellow and mauve reflections) or, before the last E major, the CTI 2B in C2⁴ (red, gray and pale green stripes).

With respect to blue, in the strophe's passages it is very weak (is part of TC 2A – hyacinth, towards violet – and TC 9A – turquoise, towards green – in C3). It becomes more present in the first antistrophe where we find “pale blue”, “a little blue”, and “cobalt blue” at the end of C3². Throughout these passages its presence is not dominant, possibly because it is contained within the other violet hues. Compared to red, its presence is minimal, which suggests that the recurrent violet contains more reds than blues.

Another interesting unifying feature of the piece is that in C3² chords mode 3(1) disappear and instead Messiaen uses chords from mode 3(4) – dominant: orange, red, with a little blue – and 6(2) – leather and chocolate colour, with red orange zones, and deep violet; some pale gray and mauve clouds – which are the modes used simultaneously, as described by the composer in the preface of the work, in C8 (the last section of the strophe and first antistrophe).

In C2² the final chords are very bright, they are described with adjectives such as “shiny Sun”, “very white snow”, “shiny yellow” or “silverish gray”. This probably means Messiaen was “blinded” by the light of these chords that finally give way to the burning last E major triad, which is very long and increasingly loud (which intensifies the colour)³⁰ and higher octave doublings are added at the very end (which lighten the colour towards white). It is interesting that the red-orange rock colour is not at all present in this last section. There are some isolated red hues, but the orange is not present. On the other hand, the violet takes more importance here; Messiaen even uses a long chord which contains “amethyst” violet (CTI 6B) which is the twelfth stone that St. John describes in the Book of Revelations (quoted by Messiaen at the beginning of the score).

³⁰ *La dynamique joue aussi un rôle: le fortissimo, le pianissimo, accusent ou diminuent l'intensité des couleurs*, Messiaen *Traité VII* p. 97

3. Conclusions I

Colour narrative

The technical analysis undertaken in sections 1 and 2 leads to a possible interpretation of the meaning behind the colour structure of *Bryce*. I will take Van Maas' similar attempt in the second chapter of *The reinvention of religious music* as a framework, where he analyzes the first chorale from Part VII of *La Transfiguration de Notre-Seigneur Jésus-Christ* (1965-69). Messiaen says this chorale is only analyzable in terms of colours: “These colors are at once sweet and terrifying and they link up with the interpretation of the Psalms addressed to God that conclude my Lecture at Notre-Dame: 'In Thy Music, we will SEE the Music- In Thy Light, we will HEAR the Light.'”

The analysis of the first chorale is based on Messiaen's own description³¹, in the same way I will interpret the music based on my chord tables above. Similarly to *Bryce*, the E major triad plays an important role and the music has a chordal texture. Van Maas introduces the idea that Messiaen is actually telling “a logically constructed story with these colours as actors and protagonists, deploying, in short, the dramatic means that are normally reserved for tonal, functional harmonic music” which he explains at a musico-religious level. In this passage, it is the red of the E major triad that faces against the blue of mode 3(2) and of the turning chord that Messiaen mentions above. Van Maas compares this tension to the “antagonism of tonic and dominant”. The red-blue

³¹ *Here the colors are very distinct because of the very slow tempo. I'll try to enumerate them. The first two chords are superimpositions of green-black tint. The third chord belongs to the category of turning chords; it contains, from high to low, blue-green, pinkish mauve, and green. The fourth chord (fourth and sixth of E major) is red. Measures 4 and 5 take up approximately the same colors as the opening. Measures 6, 7 and 8 are in both E major (red) and I Mode 2 (second transposition), containing gold and brown and also red. Measures 9, 10 and 11 return to the colors of the opening. Measures 12 and 13 are in Mode 3 (second transposition), which is gray and mauve, and they end (at measure 14) on a neutral-blue seventh. Measure 15 takes up the turning chords, from high to low: blue-green, pinkish mauve, green, then yellowish green, silver, grayish black. Measure 16 (fourth and sixth of E major, pianissimo) is red. Measures 17 and 18 are in Mode 3 (first transposition), containing orange and gold. Their crescendo brings on in force the sixth chord of E major in measures 19 and 20: this chord is red, the two piccolos heightening its light. Measures 21, 22, and 23 go back to the opening sonorities in ascending steps, ending (measure 24) on the fourth and sixth of E major, fortissimo, which is red. Measures 25 and 26 are at once in E major (red) and in Mode 2 (second transposition), containing gold and brown and also red. Measure 27 is a neutral-blue seventh; there's a great contrast in color between the red of measures 25 and 26 and the blue of measure 27. (Furthermore, measure 27 brings an A-natural and an F-sharp that didn't exist in the previous mode.) Measure 28 has two turning chords, from high to low: the first one is blue-green, pinkish mauve, green; the second is yellowish green, silver, grayish black. Measure 29 is the fourth and sixth of E major, red; in measure 30, a cluster on Mode 3 (first transposition), all the notes together (except for the B, which is reserved for the last measure), all give, because of their close position and low register, a gold and brown that is almost black. The last measure is a perfect E-major chord, deep red, very pianissimo, mysterious, with the fifth (B) made conspicuous in the upper part (sopranos, trumpet) Ibid. [5] p.53*

confrontation heats up by means of modes, chords, instrumentation and dynamics. The blue seems to win over the red in the sixth phrase, however the seventh phrase brings the E major chord back and finally, in the last phrase, there is no hint of blue and “thus the close of the chorale conveys the impression of victory, redemption and breakthrough”.

Despite the fact that a tension created by certain colours I wouldn't say there is a story of “antagonism” in *Bryce's* colour structure; this has a negative charge that I think *Bryce* lacks. The red is omnipresent, embracing the whole movement – in the second antistrophe, the pure E major triad disappears, but it is still contained within the two layers of superimposed harmonies (C1³ and C2³). After the red (orange encompassed by the red), the colour that has a distinctive significant role is the violet.

The colour violet could mean the product of the unification of the Sky and Canyons. A possible parallelism could be the blue of the Holy Spirit³² and the red of the blood – God and creation. In *Traité VII*, Messiaen quotes René-Lucien Rousseau to explain colour symbolism:

*The blue symbolizes [...] the Holy Spirit, at least on its universal wisdom aspect, the Holy Spirit, whose emblem is the dove (white), is both the flame of divine love, [symbolized by] red-orange sign (the flames of the Pentecost) and truth [symbolized by] blue sign.*³³

Another reason why a hostile story of “antagonisms” should be discarded is Messiaen's love for the violet:

*Ever since my birth I have been devoted to violet. [...] it blends blue, an extremely cold colour, with red, an extremely warm colour; but violet is capable of many nuances: there is, for example, a violet in which red dominates and which is called purple, and, at the other end of the scale, there's a violet containing more blue than red, called hyacinth-blue. These two violets have a great importance: in the Middle Ages, in symbolism and in stained glass, the one represented the Love of Truth and the other the Truth of Love. And this reversal of terms is certainly not just a play on words but corresponds without doubt very closely to these nuances of violet.*³⁴

³² Ibid. [2] p.13

³³ Ibid. [2] p.14

³⁴ Ibid. [1] p. 20

The Religious Truths that may be reflected in *Bryce* are: *Divine Love* (red-orange) – the flame of which has a little blue that symbolizes the Holy Spirit (incarnated by the vision of the volatile *Geai Bleu de Steller* against the colour of the Canyons) – and *Love of Truth* symbolized by the violet which, if we had to step back from *Bryce* as if it were a painting, would contain more red than blue.

He also talks about how in *La Transfiguration's* Part IX Messiaen keeps the listener's interest by splitting the piece into interrupted sections that extend and repeat over time, giving some predictability to the music but also leaving unknown expectations on what will be next added. This also applies to *Bryce's* structure. As has been previously demonstrated, the colorations become richer and stronger each time. By the time C2⁴ arrives, the harmonic content of the music is very complex and only certain colorations can be found together with the clusters of opposing instrumental sectors.

Roderick Chadwick's view on this “predictability about what is to come” which “fulfills at the same time with the predictable the most important condition for surprises”³⁵, and the progressive strengthening of colouration that characterizes *Bryce's* structure, is that “as we spend time apprehending any wondrous sight or phenomenon, as Messiaen did for eight days in the Canyons, our perceptions usually alter and intensify - we see more detail over time.”

Summarizing, we have seen how *musique colorée* works at a technical level and how a possible meaning can be deduced from looking at the colour analysis of the work. The following parts will deal with the problems of how this analysis relates to Messiaen's synaesthetic (and ultimately religious) experience of this music and to what degree, if any, it is experienceable by a different listener than the composer himself.

³⁵ Ibid. [5] p. 43

4. Matter and Form

Matter

There have been attempts to quantify Messiaen's cross-modal correspondence with the involvement of computer programmes³⁶ or by trying to simplify it to a one-pitch one-colour equivalence. Joseph Harris says in his dissertation: “A consistent method for defining Messiaen’s sound-colour correspondences can be established on the theory that each pitch class (pc) corresponded to a particular color, and that a chord’s resultant harmonic coloration depended upon the interaction of specific pc colors. The chapter begins by establishing base colours of the twelve pcs; it then presents a method for determining unknown harmonic colorations.”³⁷ As his research progresses I feel more strongly that this is an artificial way in to understanding how Messiaen's coloured music is conceived. To be so familiar with Messiaen's harmonic language as to be able to know (even by ear) which colours he would have seen in specific moments of his music doesn't necessarily fulfil the purpose of transcending the listener, as will be discussed in the next section. However, it is worth analyzing the *matter* of sound-colour.

*I think it rests on scientific fact modified by the personality of whoever is subject to the phenomenon, to which may be added something of imagination and of literary influence difficult to express*³⁸.

By “scientific fact” Messiaen is probably referring to the physics of sound: contradicting Harris' claim, it seems that multicoloured photisms are given by the resulting pulsations (chords) between specific frequencies (pitch). Supporting evidence for that voicing affects colour (*un même accord change de couleur par renversement*³⁹), as the CTI show, and this would mean that a fourth

³⁶ Paul E. Dworak, *Color Harmonies and Color Spaces Used by Olivier Messiaen in “Couleurs de la cité céleste”*, College of Music, University of North Texas)

³⁷ “C – clear, C#/Db – blue green, D – gray green, D#/Eb – violet, E – gray blue, F – copper (red/green), F#/Gb – sparkle, G – yellow, G#/Ab – violet, A – blue, A#/Bb – violet, B – deep red”. Joseph Edward Harris' thesis, “*Musique colorée*”: *Synesthetic correspondence in the works of Olivier Messiaen* (University of Iowa, 2004)

³⁸ Ibid. [1] p.19

³⁹ Ibid. [2] p.97

wouldn't necessarily share the same colouration as a fifth with the same pitches. When Messiaen refers to the red of the E major triad it is always in second inversion, thus having the dissonant fourth at the bottom and the major sixth/major third above. Everybody is receptive to this physical aspect of his harmonies.

*The more the sounds strike and knock the inner ear, and the more this multicoloured things move and irritate our inner eye, the more a contact is established, a rapport with another reality: a rapport so powerful that it can transform our most hidden "I", the deepest, the most intimate, and dissolve us in a most high Truth which we could never hope to attain.*⁴⁰

Other facts that we know about Messiaen's synaesthesia from *Traité VII* is that octave transpositions either whiten or darken the colour when transposed higher or lower respectively, dynamics affect their intensity, instrumentation has the power of changing the colours – sometimes cooling or hitting them up – and tempo of mixing or separating them.

As Andrew Shenton points out in *Olivier Messiaen's System of Signs*⁴¹, we need to understand the colours of the modes “semiotically – a mode in a certain transposition *means* a colour or colour combination”. Messiaen's coloured music language can be divided into two layers of codification: his involuntary synaesthetic response to complexes of sounds and the symbolic charge that the colours represent, which is given by external factors, such as his imagination, literary influence, social context, religion, etc. So that the meaning of the music is revealed to the listener, they will need to solve the equation between colour/sound and meaning/colour (the possibility of semiotic listening will be discussed in section 6). However, this coloured music sections are part of a bigger project in Messiaen's life: to transcend the listener which should be achieved through the simultaneous decodification of the two components of the equation to achieve the ultimate experience of dazzlement. To progress to the analysis of this experience we first have to understand the relationship between technique (*matter*) and how it is experienced (*form*).

⁴⁰ Messiaen, *Lecture at Notre-Dame*, p. 12

⁴¹ Andrew Shenton, *Olivier Messiaen System of Signs* (Ashgate Publishing Limited, 2008) p. 51

Form

At the beginning of *Traité VII* Messiaen writes a prologue about colour symbolism, where he quotes the work of René-Lucien Rousseau (1959). There he explains the symbolic charge of the colours green, blue, red, yellow, gold and white. At the end, he says that he has been meditating all his life on the following quote about precious stones from the Book of Revelation:

L'Ange me montra la Cité sainte, la Jérusalem céleste, qui descendait du ciel de chez Dieu, avec en elle la Gloire de Dieu. Elle resplendit autant qu'une pierre des plus précieuses comme du jaspe cristallin...

... Le rempart est construit en jaspe et la ville est l'or fin comme du vert bien pur. Les assises de son rempart sont rehaussés de pierreries de toutes sortes: la première assise est de jaspe, la deuxième de saphir, la troisième de calcédoine, la quatrième d'émeraude, la huitième de béryle, la neuvième de topaze, la dixième de chrysoprase, la onzième d'hyacinthe, la douzième d'améthyste...

Part of this, is the same quotation Messiaen writes at the beginning of *Byrce* where he adds the colours of each stone in brackets, underlying the fact that colour is a property of matter (the substance of the precious stones), and that light, inseparable from colour, constitutes its form (“Elle resplendit autant qu'une pierre des plus précieuses...”) ⁴².

“Les assises du rempart sont rehaussées de pierreries: la sixième assise est de corail (rouge), la neuvième de topaze (jaune orange), la douzième d'améthyste (violette)”
(*Apocalypse de Saint Jean*_ ch. 21, v. 19_20)

Messiaen associates colour and light with the Sacred and Divine. *Byrce* is a piece where Messiaen interprets life on Earth in terms of religious symbolism, through colours and birdsong (as well as the contrasting rhythmic sections: “this music brings forth *negative* forms of representation: it presents that which cannot be presented in positive form”⁴³). It's a good example of how Messiaen enriches religious symbolism by incorporating a sacred world outside the Church confines, without an obvious religious programme, title, set text, etc. It's as if he is saying: look beyond, God is also

⁴² The substance of “amethyste” is SiO₂ (matter), and the colour violet is part of its form which we perceive through our sense of vision. See Aristotle's *Metaphysics* on substance, matter and form.

⁴³ Ibid. [5] p. 88

there! This music that seemed about nature at first sight, and that after the analysis in sections 1 and 2 seemed to carry an encrypted religious message, we now have to acknowledge that there is far more than that, and in order to understand its *form*, we have to analyze the way Messiaen experienced it in theological terms.

5. Enlightenment through colour music

In the previous sections, we have seen how Messiaen's colour music is constructed and we can see that harmony, structure and meaning are dependent on colour. But what's the point? What justifies Messiaen's huge effort to conceive such a complex and unique musical language where technicality and complexity get in the way of the decoding process needed to fully understand this music? We cannot see the same colours (if any) as he did, so is there something else that he is trying to convey? What's the fundamental function of colour music? This experience that Messiaen calls “éblouissement” (dazzlement) is the key to understand the “final cause” of his colour music.

The fact that *Couleurs de la Cité Céleste*, the first work to be linked to an evident religious theme after a twenty year gap (1943/1944-1963) of apparently non-sacred works (*Turangalîla-symphonie*, *Réveil des oiseaux*, *Oiseaux exotiques*, *Chronochromie* and *Sept Haïkaï*) is all about colours and that Messiaen's fusion of his synaesthesia and technique became more solidified in this later stage of his life from *Couleurs* (1963), suggests a dependency between colour and religion. It is not until *Couleurs* that Messiaen starts using the word “éblouissement” with reference to colour⁴⁴: “the sound-colours symbolise the “Heavenly City” and He who inhabits. [...] That which the Apocalypse [...] designates only by a dazzlement [éblouissement]”.⁴⁵ The ultimate aim of colour music is to dazzle⁴⁶ the listener, in other words, to move the listener to another reality by means of sound vibrations, and give the listener a supernatural experience that Messiaen explained in religious terms. In the *Lecture at Notre-Dame* he says:

*Colour music does that which the stained-glass windows and rose-windows of the Middle Ages did: they give us dazzlement. Touching at once our noblest senses: hearing and vision, it shakes our sensibilities into motion, pushes us to go beyond concepts, to approach that which is higher than reason and intuition, that is FAITH.*⁴⁷

⁴⁴ Ibid. [5] p.80

⁴⁵ Preface of the score of *Couleurs*

⁴⁶ Finally, there is that breakthrough towards the beyond, towards the invisible and unspeakable, which may be made by means of sound-color, and is summed up in the sensation of dazzlement (Messiaen). Ibid [5] p. 82

⁴⁷ Ibid. [40] p. 15

In the previously analyzed sections of *Bryce*, Messiaen looks for the Divine in nature⁴⁸ and he wants to communicate his transcendental experience of the landscape, so strongly manifested in such an impressive place as the Canyons, a Cathedral of Nature, to the audience. Ultimately, what his music is designed to accomplish is the elevation of the senses of the audience. As Van Maas puts it:

Dazzlement has little to do with the representation of religious ideas by visual or musical means. The music of dazzlement certainly possesses many pictorial and symbolic features, but its most important religious moment lies in the very erasure of these figurative elements (the apparent content of the passage)⁴⁹.

Being dazzled in this context is essentially coming into direct contact with God. Below, I summarize Van Maas' argument on the experience of dazzlement from *Forms of love: Messiaen's aesthetics of "éblouissement"* in order to progress to the conclusions in section 6.

"Éblouissement"

In *Messiaen's aesthetics of éblouissement* Van Maas looks for a possible interpretation of this phenomenon. First he searches for the connection between the experience of *éblouissement* and sublimity. He explains: "traditionally, the sublime has been thought of as that which overpowers the human mind and may be thought to testify the ineffable domains of divine mystery". This overpowering of the mind and testification of somewhat divine are both present in Messiaen's dazzlement. The fact that Messiaen explains his experience in terms of God, the Light, Truths of religion, Faith, etc., is also in parallel with Kant's interpretation of the experience of the sublime. According to Kant, "the sublime is construed as a feeling that indicates that the object of perception is unrepresentable in the human's imagination". The first reaction in front of the sublime is of displeasure, because of the impossibility of understanding. One's Reason comes to rescue and explains it in terms of "God [as it would be in the case of Messiaen's coloured music], Infinity and Immortality"; then, one is satisfied and the original displeasure gives way to a feeling of "freedom". This doesn't quite seem to agree with Messiaen's experience of dazzlement. Here, the subject creates a problem which then tries to explain in terms of the ineffable – which is problematic too – and the importance of the experience of being dazzled is reduced since the subject's attention is

⁴⁸ *I see in nature a manifestation of one of the aspects of divinity, but it's equally certain that God's creations are not God himself...* Ibid [1] p.11

⁴⁹ Ibid. [5] p. 58

centered in unwrapping this knot created by the subject itself.

Unsatisfied, Van Maas then compares the experience of *éblouissement* with the phenomenon of idolatry. “Traditionally, idolatry refers to the error of giving divine worship to anyone or anything other than the true God”. This would usually involve worshipping and giving Divine powers to an object, but in Jean-Luc Marion's interpretation this devotion can be located in a mode of perception rather than in an object. The comparison is clear: in the case of the sense of vision, the subject would be dazzled, prevented of seeing beyond the light (a sort of pleasurable blinding of the senses), “the gaze no longer rushes through the spectacle stage without stopping, but forms a stage in the spectacle; fixed in it and, *far from passing beyond*, remains facing what becomes for it a spectacle to *re-spect*.”⁵⁰ Messiaen's experience doesn't agree with the phenomenology of the idol because the subject would stay dazzled by this showcase of sound-colours, unable to breakthrough towards this higher state of perception of the Truths.

The passages from Van Maas's analysis of *La Transfiguration* that I compared with the *music colorée* sections of *Bryce* share this hypnotical aspect that can lead one to idolatry. Their slowness of tempo, chordal texture, “saturation of the aural spectrum”, captivates the ear to content itself by simply listening, giving oneself to the enjoyment of the experience. Both the experience of the sublime and idolatry are not exactly what Messiaen describes as *éblouissement* because they “result from a human incapacity” that in the sublime becomes incomprehension, and in idolatry, the incapacity to see beyond or blindness through “saturation” of Light.

But how can the closed circle of the “subject's turn to itself” created by idolatry be broken? Marion presents the icon as a solution to the problem of idolatry. The icon is to be understood through the *Gestalt* as in Hans Urs von Balthasar's theology: “the words that try to express beauty, first of all revolve around the mystery of the *Gestalt* or the created. *Formosus* stems from *forma*, *speciosus* from *species*. But at the same time the question arises of the “great radiance from within” which illuminates the form from within. And then there is the created and that which makes it radiant, which turns into something valuable and loveable”. In the theory of *Gestalt*, “the whole is other than the sum of the parts”. Applied in Messiaen's music, we can interpret various elements of the music as in sections 1 and 2, but in fact, this would never come together to an understanding the *Gestalt*, the *form*, or in other words the icon, in this music. “Balthasar suggests that we regard these levels [revealed through musical analysis] as aspects of a single and unified phenomenon (“Form”) which expresses the depth and totality of its own givenness.”

⁵⁰ Jean-Luc Marion, *Ibid.* [5] p. 91

6. Conclusions II

After this detailed analysis of how *musique colorée* works at a technical level and Messiaen's experience of *éblouissement*, the problem turns to how Messiaen's ideal listener could achieve *éblouissement*. Is there a place for the experience of dazzlement during the “semiotic” listening of Messiaen's colour chords and modes? And what does this semiotic listening involve?

In the music of *éblouissement* Messiaen finds exactly the sound complexes that will clearly provoke an extraordinary light and organizes them according to the aspects of religion he wants to express (in *Bryce: Divine Love* and *Love of Truth*). If we take the interpretation from the *Gestalt's* perspective, this lighting “resists division” and presents itself in front of the listener (Messiaen), dazzling in its *form*. I agree that its form and its content can be understood independently, and that the actual experience of enlightenment leaves little space for a technical awareness of the music, since what is presented is of supernatural nature and requires complete immersion in order to “approach FAITH”. However, this is only a valid interpretation from Messiaen's perspective, and is not necessarily valid for another listener, because of the particular nature that its *form* takes, light and Light, given Messiaen's synaesthetic condition and Catholic devotion. For the *form* that this music takes in front of any listener to be truthful to Messiaen's, somehow we need to be aware of the *matter*, in order to understand the Religious Truths he talks about, and, as I will propose below, already have Faith. The problem of listening to his music doesn't only lie in the complex compositional technique used, but also in the topics portrayed before a secularized society.⁵¹

In order to determine this ideal listener, the experience can again be divided into two parts: semiotic listening (which embraces semiotic understanding discussed in section 4) and a simultaneous more passive listening, where the listener is predisposed to experience “musical” (or visual) dazzlement. Semiotic listening can only be achieved in the case of an ideal listener who is able to understand Messiaen's language semiotically at the same time as listening to the music. Although it seems possible in theory since Messiaen's *Traité VII* contains the “code” for his language, this is unlikely in practice.

In my view, the experience accessible to any listener is that of an idol in “aural form” as

⁵¹ Messiaen criticizes that parishioners *don't always know the texts they hear (although they hear them every Sunday), either because they don't understand Latin, or because they understand nothing at all, even if they're spoken to in French.* Ibid. [1] p.6

interpreted by Van Maas (which is not what Messiaen is after), because it is possible to listen and to stay entranced within the music itself – especially if one doesn't see any of the same colours as Messiaen did. Going back to Monet, one doesn't need to understand his painting technique to appreciate the work. One could then argue that to be sensitive to Messiaen's coloured music one wouldn't need to be aware of the harmonic language used. Maybe, it is not possible to breakthrough unless one already has Faith, is predisposed to believe in the supernatural in Messiaen's music, or already knows the Truths that he is talking about.

7. Analytical Table for Bryce

<p>Piano solo A1</p>	<p>Bird: Merle noir à tête jaune 1st bar: harmonically from mode 6(1): <i>grandes lettres d'or sur fond gris, avec des taches en pastilles oranges et des branchages vert assez sombre à reflets dorées.</i> 1st 3 bars right hand: mode 6(3): <i>jaune soufre transparent, à reflets mauves, avec des coins bleu de prusset brun violacé.</i></p> <p>Colour chords:</p> <p>Last chord 3rd bar: chord of transposed inversions (CTI) type 4.B: <i>blanc et or.</i></p> <p>Bar 4: CTI 1B: <i>large nappe de bleu saphir, cerclée de bleus moins intenses (fluorine bleue, bleu clair de Chartres) et recerclée de violet.</i></p> <p>Bar 5: CTI 8B: <i>dessins en spirales blanc et or, sur fond rouge carmin et bruin cuir.</i></p> <p>Bar 6: CTI 2B (missing F# and B, added E): <i>bandes rouges, grises et vert pâle.</i></p>	<p>Un peu vif, 8th = 120</p>
<p>Orch. B1</p>	<p>Bird: Geai bleu de Steller, Utah 1st trumpet: tritone on the dominant axis (F-B) and tonic (Bb-E) Strings: all pitches chromatic chords that move by ascending compound minor 3rds and harmonically piled up in minor thirds in the strings.</p>	<p>8 bars</p> <p>Bien modéré, 8th = 72 (4 bars)</p>
<p>B2</p>	<p>Bird: Tangara de l'Ouest Sequential motif with characteristic descending tritone + ascending leap of aug 7th the first time.</p>	<p>Un peu vif, 8th = 144 (5 bars)</p>

<p>Bar 1-2: mode 6(1): <i>grandes lettres d'or sur fond gris, avec des taches en pastilles oranges et des branchages vert assez sombre à reflets dorés.</i> PCs of this first 2 bars indicated as "Tangara de l'Ouest": 0x3, 1, 4x7, 5x3, 6x3, 7x2, 8x3, 10x4, 11x6</p>	<p>Bird: Geai bleu de Steller</p> <p>Motif looks like an inversion of Tangara de l'Ouest: ascending fifth + descending dim. octave. PCs for possible modal comparison: 0x4, 1x6, 2x4, 3x5, 4x4, 5x4, 6x2, 7x6, 8x4, 9x4, 10x5, 11x6. Here voices move in compound thirds as in the previous section with the same bird's name.</p> <p>Last bar (1 before R5): A+Bb+B+E+F. Pitches from mode 6(6) that will appear and expand in/from section C4.</p>	<p>Moderé, 8th = 112 (1 bar)</p> <p>(1 bar)</p> <p>11 bars</p>
<p>B3</p>	<p>Bird: Toupiiale de Scott, Utah 1st chord pitches from mode 3 (1): <i>orange, or et blanc laitieux.</i></p> <p>Last chord with pitches from mode 6(6)</p>	<p>Un peu vif, dotted 16th = 132</p> <p>7 bars</p>
<p>Piano solo A2</p>	<p>Rochers Rouge Orange (E major: Red) See tables in section 4</p> <p>New theme: 4 bars with pitches: A#/Bb-B-D#-E-F-G from mode 6(6): <i>bandes verticales blanches et noires, parmées de lunes bleu pâle.</i></p> <p>Same theme with borrowed D#</p> <p>2 A major chords in the 10th and 12th bars of this section (A major: Blue)</p>	<p>Modéré, lourd 8th = 76 (17 bars) Moderé, un peu vif 8th = 144 (4 bars) (4 bars) (4 bars)</p>
<p>Orch C1, C2 and C3 C4</p>		

C5

(13 bars after figure 8):

- First chord is the first chord of 3(2): *Bandes horizontales étagées: de bas en haut: gris foncé, mauve, gris clair, et blanc à reflets mauve et jaune pâle – avec des lettres d'or flamboyantes, d'une écriture inconnue, et une quantité de petits arcs rouges ou bleus, très minces, très fins, à peine visibles. Dominante: gris et mauve.*
- Second chord B minor
- Third chord Ab Major,
- Fourth chord G# minor + A
- Fifth bar: all G natural unison.
- CCR 12B: *Or jaune éclatant, violet pourpre taché de blanc, or et noir.* Then 3(2) as before.
- Ab Major and B minor again.
- CTI 7B: *orangé, rouge et brun, jaune citron.*
- Ab Major and G# minor + A
- Tritone: B/F + Eb/A
- C major + Db, Eb, A, D = CCR 12B: *or jaune éclatant, violet pourpre taché de blanc, or et noir.*
- and Db major + E, G, A = 3(2) as before (bar 1 of section C5)
- Tritone: Eb/A + B/F

C6

Extension of the C4 theme.

C7

Triple forte cluster chords

(from the 8th bar) Some chords similar to C5 (also warm colours):

RC 2C: *Orangé, rouge, brun et gris / jaune orange*

RC 5C: *Blanc laiteux, quartz rose / rouge et or*

15th bar: E major triad in 1st inversion, followed by E major triad + G, Bb, C from chord tables in mode 3(1) again. Followed by cluster with top E and cluster with its tritone Bb dominating.

(11 bars)

(16 bars)

Modéré, lourd 8th = 76
(17 bars)

C8	<p>According to Messiaen's 'préface': polymodality with modes 3(4) and 6(2) 3(4): <i>Dominante: orangé, rouge, avec un peu de bleu.</i> 6(2): <i>couleur cuir et chocolat, avec des zones orangé rougeâtre, et du violet foncé – quelques éclaircies gris pâle et mauve.</i></p> <p>Silence</p> <p>Portes et gouffres d'ombres (doors and abysses of shadows) Climax 1</p> <p>Trombones+double bass: descending, upper strings ascending/descending chromatic scales. Use of geophone.</p>	<p>Modéré, 8th = 120 (5 bars)</p> <p>(1 bar)</p> <p>Très modéré, 8th = 60 (4 bars)</p> <p>83 bars</p>
Piano Solo A1 ²	<p>Bird: Merle noir à tête jaune 4th bar: CTI 2C: <i>orangé avec des taches de jaune éclatant, de rouge, et de brun chaud.</i> and CCR 11A: <i>jaune et vert claire, blanc rosé.</i> 5th bar: CCR 11B: <i>rouge rubis, or et acier.</i> 6th bar: Re-arranged RC 2A: <i>or et orangé/violet bleu ou hyacinthe.</i> RC 2: <i>Effect coloré global: dessins de fleurs brunes, violettes, blau pâle, et or, sur fond orangé. Dominant: Orangé.</i> 7th bar: RC 12: <i>Effect coloré global: cerclestrès minces, gris, violets, roses, et or, entourant une large zone de Bleu Chartres Dominante: Bleu.</i> 9th bar: CCR 3A: <i>bleu dégradé vers le blanc, orangé capucine.</i> And 3B: <i>rouge carmin, gris clair, brun cuir.</i></p>	<p>Très modéré, 8th = 60 Un peu vif, 8th = 120</p>
Orch B1 ² B2 ² B3 ² B4 ²	<p>Same + 2 bars + 1 bar x 2</p>	<p>10 bars</p> <p>(4 bars) (6 bars) (2 bars) (2 bars) 14 bars</p>

<p>Piano Solo A2²</p>	<p>Bird: Troupale de Scott Bars 1-4 and last - from mode 6(6) chord- are identical to the previous A2.</p>	<p>Un peu vif, dotted 16th = 132 10 bars</p>
<p>Orch C1², C2² and C3² C4² C5² C6² C7² C8²</p>	<p>See tables in section 4 Only slightly modified. (Use of A major and C major triads in 10th and 12th bars) +2 +1 End: CCR¹ 12AB progression: <i>Violet clair hachuré de vert, bleu pâle, gris argenté et noir/Or jaune éclatant, violet pourpre taché de blancheur, or et noir.</i></p>	<p>Modéré, lourd 8th = 76 (21 bars) (12 bars) (13 bars) (17 bars) (20 bars) (10 bars) 93 bars</p>
<p>Piano Solo A1³</p>	<p>Bird: Merle noir a tête jaune 3rd bar: chord of contracted resonance (CCR) type 1B from up to down: <i>vert bleuté, violet, gris de plomb.</i> Last chord of 4th bar has pitches from mode 2(3) and pitches from the 3 chord in the chord row: <i>Feuillages vert clair et prairie, avec des taches de bleu, d'argent, et d'orange rougeâtre.</i> 5th bar: CCR9B: <i>bleu violacé, café clair, dégradé vers le blanc, vert et argent, brun rougeâtre.</i> And RC 9B: <i>jaune taché de rouge</i> (upper chord, with an added B instead of an E) + <i>gris d'acier.</i> 6th bar: CCR9C: <i>brun et blanc enfumé+jaune d'or.</i> <i>Effect coloré global of CCR 9ABC: bandes alternées grises et jaune d'or: Dominant: jaune d'or.</i> Last two chords from CTI 6A: <i>cuivré, or et brun, rouge rabattu par le noir.</i></p>	<p>Un peu vif, 8th = 120</p>

	4B (plus added F): <i>blanc et or</i> .	7 bars
Orch. B1 ³ B2 ³ B3 ³ B4 ³	Same (but in the 4 th bar appears as the 2 nd bar that originally was silence) +4 5 bars x3 (last chord: Bb-E-A-B)	(4 bars) (8 bars) (5 bars) (5 bars) 22 bars
Piano solo A2 ³	Troupiale de Scott 1 st chord pitches from mode 3 (1) : <i>orange, or et blanc laiteux</i> .	Un peu vif, dotted 16 th = 132
Orch C1 ³ and C2 ³	Rochers rouge-orange See tables in section 4	21 bars Modéré, lourd 8 th = 76
Piano solo A3	(GOLDEN SECTION?) CCR 8A: <i>rose mauve rubellite, gris mauve peau de pêche, bleu de cobalt</i> .	8 bars Un peu vif, 8 th = 100 1 bar
Orch D1	1 st bar - strings: CTI 11A: <i>brun cuir, surmonté de lapis-lazuli bleu mat, et d'un peu de violet</i> . Bird: Carouge bronzé, Utah : PCs 0,1,3,4,7,8,9 from mode 3(2): <i>Bandes horizontales étagées: de bas en haut: gris foncé, mauve, gris clair, et blanc à reflets mauve et jaune pâle – avec des lettres d'or flamboyantes, d'une écriture inconnue, et une quantité de petits arcs rouges ou bleus, très minces, très fins, à peine visibles. Dominante: gris et mauve</i> .	8 th = 100 (2 bars) (2 bars)
D2 (similar to C3)	E major chord (plus Merle noir à tête jaune : 1,11,8+8,4,11+11,8,4) Passage in mode 3(2)	Modéré, 8 th = 76 (2 bars)

D3	Chorale all pcs from mode 3(1). Dominante: Orange, or et blanc laitieux. On beat chords: 4(6) <i>Couleur générale: rouge carmin, pourpre violacé, orange, gris mauve, gris rose.</i>	Moderé, 8 th = 88 (4 bars)
Piano solo A3 ²	Same (CCR 8A)	Un peu vif, 8 th = 100 1 bar
Orch D1 ²	1 st bar: Same CTI 11A + Mainate rouillé, Utah In the second bar on top of CTI 11A : pcs from 6(5): <i>or, bleu pâle, violet, avec des dessins bruns</i> Merle noir à tête jaune (mode 3(1) as before, E Major chord)	Moderé, 8 th = 76 (4 bars)
D2 ²	Same	Moderé, 8 th = 76 (2 bars)
D3 ²	+10	Moderé 8 th = 88 (14 bars)
Piano solo A3 ³	4 th arp.: RC 1C: <i>bleu violet dégradé vers de le blanc/violet bleu ou hyacinthe.</i>	Un peu vif 8 th = 100 1 bar
Orch D1 ³	Merle noir à tête jaune, Utah 1 st bar – strings : RC 2B : <i>capucine et rouge-orangé/bleu de prusse clair, très dégradé vers le blanc</i> 2 nd bar RC2C: <i>orangé, rouge, brun et gris/jaune orange</i> 3 rd bar: CCR ¹ 9A: <i>violet Magenta, blanc rosé, rouge orangé</i> 4 th bar: CCR ¹ 9B: <i>bleu violacé, café clair, dégradé vers le blanc, vert et argent, brun rougeâtre.</i>	8 th = 100 (5 bars)

	<p>5th bar: possibly CTI 1B (added C and G) which also contains violet: <i>large nappe de bleu saphir, cerclée de bleu moins intenses (fluorine bleue, bleu clair de Chartres) et recerclée de violet.</i></p> <p>Top voices moving in mode 4(6) <i>en accords parallèles</i>: <i>Couleur générale: reflets: rouge carmin, pourpre violacé, orange, gris mauve, grise rose.</i> + Red E major chord</p> <p>Tourterelle à altes blanches, Utah</p>	
D4	+1	Un peu vif, 8 th = 92 (2 bars)
D5	+1	Très modéré 16 th = 100 (4 bars)
D4 ²	+1	Un peu vif 8 th = 92 (3 bars)
D5	+2	Très modéré 16 th = 100 (5 bars)
D4 ³		Un peu vif 8 th = 92 (4 bars) 23 bars
Piano solo A4		
		Modéré, 8 th = 80 (4 bars)
		Un peu vif, 8 th = 120 (1 bar)
		Plus vif, dotted 16 th = 168 (2 bars)
		Un peu vif, 8 th = 132 (1 bar)
		Très modéré, 8 th = 72 (3 bars)

	<p>Trill (Pcs: B-C-C#-D)</p> <p>E Major triad in root position</p> <p>Troupiale de Scott (Utah) [...]</p>	<p>Vif, 8th = 192 (5 bars)</p> <p>Très modéré, 8th = 60 (1 bar)</p> <p>[...]</p> <p>68 bars</p>
<p>Orch E</p> <p>C2⁴</p>	<p>(Troupale de Scott + Tangara de l'Ouest) Coda in the style of Alleluia plaintchant with the Tangara de l'Ouest in the Woodwinds and Xylorimba (Cloches in mode 2(2) (melody): <i>spiraies d'or et d'argent, sur fond de bandes verticales brunes et rouge rubis. Dominante: or et brun</i>)</p> <p>See tables in section 4</p>	<p>Un peu Vif 8th= 120 (36 bars)</p> <p>Modéré, lourd 8th = 76 (12 bars)</p> <p>48</p>

8. Bibliography

ARISTOTLE, *Metaphysics*

BALMER Yves, *Religious literature in Messiaen's personal library, Messiaen the Theologian* (Andrew Shenton, Ashgate Publishing Limited, 2010),

BANNISTER Peter, *Messiaen as preacher and evangelist in the context of European modernism, Messiaen the Theologian* (Andrew Shenton, Ashgate Publishing Limited, 2010),

BERNARD Jonathan, *Colour, The Messiaen Companion*, (Peter Hill, Faber and Faber, London, 1995)

BERNARD Jonathan W., *Messiaen's Synaesthesia: The Correspondence between Colour and Sound Structure in His Music*, Music Perception, (University of California Press, 1986)

CHEONG Wai-Ling, *Composing with Pre-Composed Chords in the Finale of Et expecto resurrectionem mortuorum*, *Revue de musicologie* 90/1, n. 1 (2004)

CHEONG Wai-Ling, *Plainchants as Coloured Time in Messiaen's Couleurs de la cité céleste*, *Tempo*, Vol.64, No.254 (Cambridge University Press, 2010)

CHEONG Wai-Ling, *Messiaen's Chord Tables: Ordering the Disordered*, *Tempo* Vol. 57, No. 226 (Cambridge University Press, October 2003)

CHEONG Wei-Ling, *Rediscovering Messiaen's Invented Chords*, *Acta Musicologica*, Vol. 75, Fasc. 1 (International Musicological Society, 2003)

CROSS Jonathan, *The Stravinsky Legacy* (Cambridge University Press, 1998)

DWORAK Paul E., Color Harmonies and Color Spaces Used by Olivier Messiaen in “*Couleurs de la cité céleste*” (College of Music, University of North Texas)

GRIFFITHS Paul, *Catalogue de Couleurs: Notes on Messiaen's Tone Colours on His 70th Birthday*, *The Musical Times*, Vol. 119, No. 1630 (Dec., 1978), pp. 1035-1037, *Musical Times Publications Ltd.*

HARRIS Joseph Edward, “*Musique colorée*”: *Synesthetic correspondence in the works of Olivier Messiaen* (University of Iowa, 2004)

MESSIAEN Olivier, *Traité de Rythme, de Couleur, et d'Ornithologie (1949-1992) en Sept Tomes, Tome VII* (Alphonse Leduc, Paris, 2002)

MESSIAEN Olivier, *Conférence de Kyoto*, (Paris: Alphonse Leduc, 1988)

MESSIAEN Olivier, *Musique et couleur: nouveau entretiens avec Claude Samuel* (Paris: Pierre Belfond, 1986)

MESSIAEN Olivier and WATTS Harriet, *Canyons, Colours and Birds: An Interview with Olivier Messiaen*, *Tempo, New Series*, No. 128 (Cambridge University Press, March 1979)

MILLE Olivier, *Olivier Messiaen, La Liturige de Cristal* (DVD, 2007)

SAMUEL Claude, *Conversations with Olivier Messiaen*, (Paris, Belfond 1967, English translation: Stainer & Bell Ltd, 1976)

SHENTON Andrew, *Olivier Messiaen System of Signs* (Ashgate Publishing Limited, 2008)

VAN MAAS Sander, *The Reinvention of Religious music: Olivier Messiaen's breakthrough towards the beyond*, Fordham University Press (USA, 2009)

VAN MAAS Sander, *Forms of love: Messiaen's aesthetics of “éblouissement”*, *Messiaen Studies* (Robert Sholl Cambridge University Press, 2007)