ABSTRACT

Timbre is doubtlessly one of the main paradigms of Debussy’s music. It is thus obvious to consider timbre research as a promising tool for the analysis of Debussy’s works. Within the scope of this text, this process is exemplified by an analysis of Nuages, the first movement of Debussy’s Nocturnes for orchestra (1897–99). Timbre constellations are investigated by close listening and by implementation of the MIRtoolbox software (developed by Olivier Lartillot and Petri Toivanen in 2007). By comparing four different recordings, a close relationship between bars 5–8 and 80–82 of Nuages is revealed. In respect to their properties of sound and harmony, these passages are ambiguous. This might tempt us to call Debussy’s treatment of sound ‘mysterious’ or ‘inscrutable’. It should always be kept in mind, however, that these ambiguities are composed out with the utmost precision. This insight leads to a reflection on questions of form. If we locate and describe specific constellations of timbre and their precisely defined properties, we are able to compare different areas of form that feature similar properties of sound. As a result, we realise that musical elements are not merely juxtaposed in Debussy’s music, but interwoven in a complex fashion. By re-evaluating formal aspects in their relation to timbre, we approach a new perspective of form that is informed by current timbre research.

1. INTRODUCTION

1.1 Preliminary note

In this text, selected passages of four different recordings of Nuages are analysed, and the corresponding sonograms are reproduced. Via <www.lukashaselboeck.com/266/>, it is possible to download the score and listen to the recordings.

1.2 Debussy analysis

In the history of analysis of the works of Debussy, not only promising perspectives, but also persistent myths emerged. New approaches presented by Debussy scholars such as Roy Howat, Richard Parks or Simon Trezise conflict with the belief that the music of the French master is largely resistant to analysis, or even ‘unanalyisable’. This view was already held by some of the composer’s contemporaries (e.g., Jules Massenet who described Debussy’s music as a ‘mystery’ — a position that seemed compatible with the sceptical attitude towards analysis exhibited by the composer himself). Consequently, a tendency of reception was established and is partly still alive today: In the catalogue of the exhibition Debsussy. La Musique et les Arts, which was realised in the honour of Debussy’s 150th birthday in the Musée d’Orsay, the art historian Jean-David Jumeau-Lafond quoted Massenet’s words as a motto which prefaces his text: ‘Debussy, c’est l’enigme’ (Jules Massenet, quoted by Jumeau-Lafond 2012, 57).

Debussy’s music is irrefutably not at all simple to analyse, but it is evident that analytical obstacles can be amplified by an overemphasis of tradition; if our goal is to achieve new analytical results, it is not productive to speak repeatedly about the difficulties encountered thus far. Far more constructive is the exploration of new strategies in order to investigate the formal and structural multiperspectivity of Debussy’s music. Since 1945, the importance of this concern was realised by many scholars. Not only in France, but also in Germany there have been strong efforts to re-interpret the form and structure of Debussy’s music. In matters of form, one of the main problems was the difficulty in exploring its relationship to other domains: harmony, melody, rhythm, and timbre. It subsequently seemed reasonable to focus on structure, which was the main analytical paradigm after 1945. Consequently, serial composers (see e.g. Eimert 1957; Stockhausen 1963) analysed Debussy from a statistical perspective.

Later, new approaches were presented which were not limited to structural thinking: Albert Jakobik developed a specific theory of sound constellations in Debussy’s music (Jakobik 1977). Claudia Zenck-Maurer wrote about Debussy’s sometimes peculiar modes of notation and other topics that had been traditionally neglected (Zenck-Maurer 1974).

Other aspects were emphasised in the USA. In Roy Howat’s book (Howat 1983) Debussy’s music was analysed from the perspective of proportion. In Matthew Brown’s and Allen Forte’s analyses, Debussy research was linked with Schenkerian analysis and set theory (Forte 1991; Brown 1993). These analytical publications provoked controversy and gradually enriched the analytical tools at our disposal.

The aim of this text is to follow this process of widening horizons, and to consider timbre research as a promising tool for Debussy analysis – an important investigation when timbre is one of the main paradigms of Debussy’s music. As a second step, it will also be crucial to correlate the dimension of timbre with other domains. It may thus be possible to re-evaluate formal aspects in their relation to timbre, and to realise an approach to form which is informed by current timbre research.

1.3 Timbre research

Within the wide field of music analysis, timbre research has become an important factor, but this was not always the case. In theoretical writings of the 18th and 19th centuries, matters of timbre were widely neglected. The term timbre (in German: ‘Klangfarbe’) was used from circa 1822 (Muzzulini 2006, 265). Some decades later, scholars such as Hermann Helmholtz and Carl Stumpf began to explore the properties of timbre. Around 1910, composers and music theorists such as Schoenberg and Ernst Kurth began to reflect matters of timbre theoretically. All these approaches were vitally important, even though they were sporadically employed and not thoroughly interconnected. From the 1950s, the investigation of timbre intensified steadily — not only in musicology and philosophy (Theodor W. Adorno), but also in timbre research (in German: ‘Klang-
poser wrote to Ysaÿe (Cox 1974, 19):

violinist Eugène Ysaÿe. Towards the end of 1894, the com-

position of ‘Nuages’ (1894) to ‘Images’ (1905–1908, 1912), and finally ‘Jeux’ (1912–13). In the case of ‘Nuages’, the relevance of colours was confirmed by the composer himself, as quoted above in the introductory note (‘grey tones lightly tinged with white’). On another occasion, in conversation with Paul Poujaud, Debussy mentioned the experience of ‘the effects of clouds on the Seine at the Place de la Concorde’ (Herlin 1999, xiii-xiv) and its influence on ‘Nuages’. In a further well-known statement, Debussy said that music consists of ‘colours and rhythmised time’ (Lesure / Nichols 1987, 184). This underlines the major importance of colour in Debussy’s music. It is obvious that ‘Nuages’ is a study of the different nuances of colour, and — if we accept this analogue — a study of musical timbre.

2.4 Robert Cogan’s analysis of ‘Nuages’

In 1984, Robert Cogan presented an attempt to analyse ‘Nuages’ from the perspective of timbre. This analysis is part of his extensive book Sonic Design, in which properties of timbre are considered without using software (sonograms etc.; of course, in the 80s, analytical software tools were not widely developed). Cogan prefers a mode of analysis ‘that accounts for the complete sound of music. It recognises sound’s many supranotational elements (…)’ such as ‘spectra, attack and incidental noise, interference phenomena, and tone modulation’ (Cogan 1976, 397).

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1 Lerdahl suggested the hierarchical analysis of the timbres of certain pieces using the paradigm of treelike ramification (Lerdahl 1987, 154). This approach was taken on and discussed by other authors. However, in the case of Debussy it seems questionable whether this approach can be successfully implemented.

2 See e.g. the quoted letter above. Instead of relating to the traditional form of the Nocturne, Debussy emphasises impressions and effects of light.
In his analysis of *Nuages*, he considers many factors that lead to a global perception of the piece from the perspective of timbre. First, he describes the process of registral change (Cogan 1976, 390: Here, the principal motion of *Nuages* through six different registers is reproduced). On p.393, Cogan summarises this motion graphically (ex.1).

Ex.1: Registral Change in *Nuages* (after R. Cogan)

In a further step, he elaborates on the acoustic properties of orchestral sound and distinguishes different phases. The piece opens with phase 1: In the beginning, a pure quality of sound is dominating which reminds us of sine wave tones (see p.387: phase 1 is identical with stage 1). In phase 2, the intensity of the higher partials, roughness and brightness increase. Phase 2 consists of stages 2 (p.387), 3 and 4 (p.388) where Debussy begins to use divided writing and doublings for strings and woodwinds. In phase 2, the higher interference of partials is a result of the higher tessitura, full instrumentation, but also of the *divisi* setting. In phase 3, spectral intensity decreases again (see stage 5, p.388, where the divided writing for strings continues, but in *pp* dynamics, and also stage 6, p.389 — here we observe the same —, and stages 7–8a and 8b where discrete pitches are clouded, leading to a high relevance of noise).

If we consider the overall curve of brightness and roughness, we see that brightness and roughness are most intense in the middle phases of the piece (see ex.2: spectral brightness, and ex.3: spectral roughness; both of these MIRtoolbox-graphs relate to the Ashkenazy recording).

### 2.5 Timbre analysis of *Nuages* with support of the software MIRtoolbox

In this paper, I will complement Cogan’s approach by generating timbre analyses with the software MIRtoolbox (Lartillot 2007). In order to manage the complexities of sonogram analysis and to exclude accidental misinterpretations, four recordings of *Nuages* by Vladimir Ashkenazy, Pierre Boulez, Roger Désormière and Arturo Toscanini are analysed and compared:

- Arturo Toscanini, NBC Symphony Orchestra 1953, RCA Red Seal
- Roger Désormière, Czech Philharmonic Orchestra 1961, Supraphon SUM 30026
- Pierre Boulez, Cleveland Orchestra 1995, DG 6375943
- Vladimir Ashkenazy, Cleveland Orchestra 2000, Decca 467428

This comparative process of analysing and listening from the perspective of timbre leads to the following results: At the beginning and end of this piece an ambivalent quality of sound dominates. Two different focal areas of harmony are present which relate to the central pitches g and b, with neither of these harmonic poles being given any clear preference or stability. This ambivalence is supported by the refined use of timbres.

The piece begins with the fifth b–f# (bar 1). The harmony of the first two bars can be traced back to a modal scale based on b. In bar 3, a process of chromatic voice leading leads to another fifth based on g (g–d). This change of harmonic orientation is continued in bar 5, where the third g–b is reached in the clarinets and bassoons. Here, the French horn plays a signal motive, which returns several times in the course of the piece — always on the same pitches: c#, d, e and f ascending, and then de-
scending again. In his analysis, Bruno Plantard pointed out the contrast between the opening (based on the fifth b/f#) and the following passage (bars 5–10, based on the tritone b/f; Plantard 2004, 166). In this context, let us now discuss selected timbre analyses of the passage bars 5–8, beginning with the Ashkenazy recording (ex.4a).

The sonogram analysis of the seconds 16–32 shows that in this recording the pitch g4 at about 400Hz is most intense. In bar 6, the g4 is played by the flute (the g4 of the clarinet, bar 5, is continued here). The g3 of the horn which is played one octave below, should actually be more intense (the partial richness of the horn is high), but obviously the first partial of the horn combined with the flute leads to the resulting strong g4. Another reason might be the fact that the main formant of the horn is situated at about 340 Hz (Jordan 2007, 31), and g4 is near to this focal point (f4 = 349 Hz, g4 = 392 Hz). Therefore, during the first six bars the orientation turns from b to g, which is confirmed by close listening.

When the muted strings enter, the situation changes: The clarinets play g / b – actually not as a third, but as a tenth g3–b4. The g4 is played by a small number of the violins, but the instruments are muted, and therefore the sound is less intense. There is an octave doubling (g3–g4) with the second clarinet, but the support from below is weak because the formant region of the clarinet is much higher than g4. As far as the intensity of partials is concerned, the interconnection of clarinet and muted string instruments is not strong, and g5, which is also played by the muted violins, is likewise not in the foreground. The b4 is stronger because it is played by the first clarinet and reinforced by the first partial of the French horn (b3). Moreover, this sound is complemented by a timpani roll on b2, and by the b6, which is present in the upper voice of the muted violins. Consequently, at second 26 of the Ashkenazy sonogram, b4 (at about 500 Hz) is more intense than g4 (at about 400 Hz). Additionally, f5 (at about 700 Hz) is important (this is the first and third partial of the bassoons, which play f3 and f4).

If we compare the four recordings, there is a similar result in the Désormière sonogram (ex.4b): During the analysed passage, b4 and also b5 become stronger than g4. In the Boulez sonogram, b4 is intense from the beginning of the analysed passage — there is a strong third g4–b4 in bar 5–6 —, and thereafter, the intensity of g also weakens; b4 remains in the foreground (ex.4c). Due to the analogous instrumentation of g4 and b4 in bar 6 (horn and flute are combined), no reason actually exists for a different intensity of the pitches. Differences are obviously motivated only by nuances of interpretation.

Ex.4b: Sonogram of the Désormière Recording, sec. 20–35

Ex.4c: Sonogram of the Boulez Recording, sec. 15–26

Ex.4d: Sonogram of the Toscanini Recording, sec. 15–26

In the Toscanini sonogram, we arrive at the same result (ex. 4d), as far as g4 and b4 are concerned. However, there are different accentuations of timbre in deeper and higher frequencies from bar 7 onwards (but we should remain cognisant that such differences may arise as a result of recording techniques, or of recording quality — especially when dealing with historical recordings).

Altogether, the balance of timbre is quite diverse across the four recordings, but there are also some common properties: In bar 5, the pitch g4 is strong. With the entrance of the muted
strings in bar 7, it loses its intensity. As a result, we perceive an
ambiguous situation: The first two bars are based on the pitch b,
and in the following bars, g comes into the foreground. This
passage can be analysed by reference to an acoustic mode on g.
However, sonogram analysis and close listening suggest that
from bar 7 onwards the base of this mode (g) is weakened
because the pitch b is more intense. This leads us to the ques-
tion of whether this passage is orientated towards the central
pitch b or g. Obviously, there is no simple answer: In bars 7–8,
the ambivalence of b/g is not only prolonged, but also rein-
forced. This leads to the conclusion that the first eight bars tend
toward an ambiguity of sound which can be listened to in dif-
fferent ways.

In the middle passages of the piece, Debussy prefers har-
monic constellations which sound warmer than the beginning –
e.g. textures based on parallel voice leading (ninth and ele-
venth chords over g and b minor triads). A further passage
which is based on a pentatonic scale over d# (bar 64ff.) is
crucial as a counterbalance to the colours of the beginning.

Ex.5a: Sonogram of the Ashkenazy Recording, sec. 341–52
Ex.5b: Sonogram of the Désormière Recording, sec. 335–46

The final part (bar 80ff.) can be called a ‘recapitulation’ in
some respect. Due to different aspects of harmony, melody,
rhythm and timbre, the listener is reminded of bars 5–8, which
have already been analysed above. However, the sonogram of
the Ashkenazy recording (ex.5a) suggests that there is a deci-
sive difference between these passages: From the beginning of
bars 80–82, b4 (about 500 Hz) is stronger than g4 (about 400
Hz). This can be explained by the following: The bassoon is

playing b2, and the third partial of this pitch is b4. The main
formant of the bassoon is situated between g4 and e5 (Mertens
1975, 57) with the centre a4. Therefore, b4 is near to the centre
of the bassoon formant zone, and this may contribute to its high
intensity.

Ex.5c: Sonogram of the Boulez Recording, sec. 290–96
Ex.5d: Sonogram of the Toscanini Recording, sec. 277–86

If we compare the sonograms of the Ashkenazy, Boulez,
Désormière and Toscanini recordings, we retrieve similar
results: In the Toscanini sonogram (ex.5d), b4 is also more
intense than g4. In the Boulez sonogram (ex.5c), not only b4,
but also b2 is emphasised. And finally, in the Désormière so-
ogram (ex.5b), b2 dominates. The pitch b4 is dominant in
three of the four sonograms (5a, 5c and 5d), even if it sounds
only ‘virtually’ (as the third partial of the b2 of the bassoon), in
contrast to bar 6, where the b4 is played by the flute, but does
not have significant effects on the timbral hierarchy. This
confirms the previously outlined view that at the beginning and
end of Nuages, there exists a fragile balance between different
focal areas of timbre (mainly b and g) which depends on
changing overtone relations.

Another interesting fact lies in bar 80, where the French
horn plays f4. In the Ashkenazy sonogram we observe a high
intensity of c6, the second partial of f4, at about 1050 Hz. This
partial is situated in the formant region of the French horn
(which extends from g5 to e6 with the centre b5; Mertens 1975,
49). Therefore, not only b4 is intense, but there is an additional
conflict between b4 (500 Hz) and c6 (1050 Hz) which may
contribute to the dissonant effect of this sound constellation.
The close relationship between the bars 5–8 and 80–82 could
therefore also be explained by this ‘timbral dissonance’ which
forms a link between the two passages (b4/f5 and b4/c6).

4 This formal sound design brings Wagner’s Tristan prelude into mind,
where the beginning and the end are dominated by enigmatic woodwind
sounds, in contrast to the middle passages where a powerful orchestral
upsurge is dominated by the strings and brass.
In the following bars, the mentioned harmonic constellations remain, albeit with modifications: In bar 84, b2 is omitted, and the French horn motif (c#4, d4, e4, f4) plus the f3/g3 of the clarinets remain. In bar 88, the b2 (tremolo of the celli and timpani) and b3 (French horn) change their harmonic function again — now the b is situated over d2/e2 of the celli and double basses. Tremolo and timpani sound increasingly dominates. Bars 94 (g1 in the double basses) and 98 (flute motif) remind us of the idyllic middle section (bars 64ff.). However, the piece ends with the b played by the strings and timpani. Thus, the ambivalence of b/g is continued into the final passage.

3. CONCLUSION

The sonogram analyses presented here demonstrate that the beginning and end of Nuages are characterised by timbre constellations which fluctuate between the central pitches b and g. In respect to harmony and sound, these passages are ambivalent.

Given these findings, it is crucial to draw the right conclusions. Certainly, this exemplified ambivalence might tempt us to simply call this treatment of sound ‘mysterious’ or ‘inscrutable’: ‘Debussy, c’est l’enigme’. However, it should be considered that these ambiguities are composed out with utmost precision, or, as Vladimir Jankélévitch has formulated it (Jankélévitch 1976, 17):

À lieu quoi tout secret est secret en complication et en ténèbreuse profondeur, Debussy est patent parce que ses mystères sont clairs. Debussy est mystérieux, mais il est clair.5

This insight, which is confirmed by sonogram analysis in this text, might also lead to a new reflection of the question of form. If we locate and describe sound constellations and their precisely defined properties, we should also be able to compare different formal sections that feature similar properties of sound. By doing that, we realise that Debussy’s forms consist of elements which are not merely juxtaposed, but complexly connected and interwoven.

In the case of Nuages, it may make sense to re-evaluate the A-B-A’-form by connecting its conventional formal design to the inner properties of timbre. By realizing that bars 5–8 and 80–82 are characterised by a specific ambiguity of sound, we recognise that sound qualities and their relationship to form and listening are at the core of Debussy’s music.

There are conclusions that ultimately reach even further. Timbre analysis allows for re-evaluation of the term ‘impressionism’ and its misinterpretation as vague pointillism.6 This implies the implementation of a perspective which does not rely on our intuition exclusively, but which is informed by current timbre research.

KEYWORDS

Form, Musical Perception, Timbre

REFERENCES


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5 ‘While every secret is obscured by complication and shadowy depths, with Debussy everything is open because his mysteries are clear. Debussy is mysterious, but he is clear’ (transl. Anne Ewing).

6 This misinterpretation has a long history. As far as we know, the first application of the term ‘impressionism’ to Debussy’s music can be found in Henri Delaborde’s report on Nocturnes (quoted after Clevenger 2001, 21: 526–34). ‘One recognizes in his [Debussy’s] case a feeling for musical color, the exaggeration of which makes him too easily forget the importance of precision of design and form. It is strongly desired that he guard against this vague ‘impressionism’ that is one of the most dangerous enemies of truth in works of art. The first movement of the symphonic piece of M. Debussy is a sort of adagio prelude, of a reverie and affectation that lead to confusion.’

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