

# La Fille aux Cheveux de Lin : a model of proportional planning

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In this article, I try to show how apparent freedom can coincide with rigorous planning by the composer.

Keywords: Lucas sequence, proportion, Golden Section.

After Dr Roy Howat's exceptional book, *Debussy in Proportion*<sup>1</sup>, it seems hardly necessary to go any farther into proportional considerations in Debussy's music. Yet the study of *La Fille aux Cheveux de Lin* brings to light certain points of interest that may expand our knowledge of the question of proportion in general, and provide an understanding of the work that may inform our interpretation of it.

Some years ago, the author of this short article attended a lecture that proposed to explain the formal proportions of the prelude *La Fille aux Cheveux de Lin* in terms of the Fibonacci series: the lecture was interesting and seemed close to the mark in certain cases but to be inaccurate, to the point of irrelevance, in others. This led to a detailed investigation of the structure of the piece. It soon transpired that Debussy appeared to have been using the Lucas sequence in the place of the already much used Fibonacci sequence.

It is known that Debussy was eager to keep up with artistic, scientific and aesthetic developments and indeed was probably conscious of the activities and writings of Charles Henry who was himself a close colleague of Édouard Lucas. It is therefore perfectly plausible that, given his interest in proportional balance in music, he should sooner or later have made experiments with integer expressions of the Golden Section other than that of the Fibonacci series, and particularly by the use of other patterns discovered or brought to light by Édouard Lucas.

The Lucas Sequence has many characteristics in common with the Fibonacci Sequence: it is an additional sequence perpetuated by the sum of the previous two values; the proportion between consecutive values becomes closer and closer to that of the Golden Section as the sequence progresses, being alternately too large and too small, by ever smaller margins.

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<sup>1</sup> Howat R., *Debussy in Proportion*, Cambridge, 1983

The sequence reads: 1, 3, 4, 7, 11, 18, 29, 47, 76, 123, 199, 322, etc.

It is easy to see how this sequence could capture the imagination of an artist already interested in proportion. Any composer is naturally concerned with proportion: Debussy's forms, in particular, that tend not to adhere to previously established formal patterns, depend largely on proportional balance.

The prelude *La Fille aux Cheveux de Lin*, eighth piece in the first book of Preludes (1910), has undergone many analyses of various sorts. And although it has even been "explained" in terms of the Fibonacci sequence, it seems impossible on closer inspection not to allow that in fact it is the numbers of the Lucas sequence that define the formal and durational proportions of this piece. One could even go so far as to say that they may help to explain certain possible doubts or peculiarities often related to this well-known piece.

The prelude opens with a three-phrase melody in which the third phrase repeats the melodic character of the first phrase in a new harmonic context:

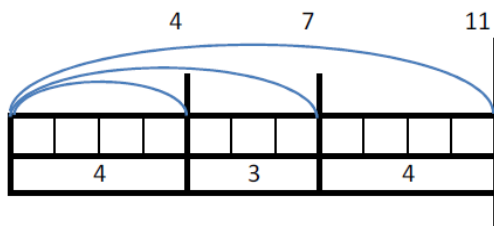
The image displays a musical score for the first 11 bars of the prelude 'La Fille aux Cheveux de Lin' by Debussy. The score is written for piano and is in 3/4 time with a key signature of three flats (B-flat major). The melody is divided into three phrases: the first phrase (bars 1-2), the second phrase (bars 3-4), and the third phrase (bars 5-7). The third phrase repeats the melodic character of the first phrase in a new harmonic context. The score is presented in three systems, with bar numbers 1-4, 5-7, and 8-11 indicated above the staves.

Ex.1 Bars 1-11: The initial melody of the Prelude.

Let us observe the durational structure of this melody.

Ex.2 Durational analysis of the initial three-phrase melody.

First of all, the melody as a whole totals 11 bars; 4 bars for the first phrase; the addition of 3 bars for the second phrase brings the total up to 7 bars; the final 4 bars of the third phrase complete 11 bars in all.



Ex.3 Proportions of the initial melody.

Although the overall phrase length adheres to a regular pattern using the unit of the bar (i.e. 3 crochets), the details of the melody itself are based on a different unit: that of the crotchet, or a third of the bar-length. Thus the proportion between the two units is that of 1:3, or the relationship between the first two values of the Lucas sequence.

The first phrase can be divided into two parts: one of melodic movement lasting 7 crotchet units (and which, curiously enough, contains 18 notes, though it is hard to feel this is really significant); and one of repose lasting 4 units. It is often commented that this note is unexpectedly long: this explanation, however, shows the necessity to hold this note for its full length. The following two-quaver-upbeat to the following bar (1 unit) represents the difference between 4 bar-units and 11 crotchet-units.

The second phrase has a very similar structure, though in diminution, for the values are all one step back in the Lucas sequence: 4 becomes 3; 11 becomes 7. One could even say that the upbeat represents a “diminution” of 1, becoming 2. This paradox can in fact be seen to be produced if we extend the Lucas sequence backwards: after 11, 7, 4, 3, 1, the next value would be the difference between the previous two, or  $3-1=2$ . The subdivision of the second phrase into 4 + 3 units to make 7 in total, may seem a little forced at first: however, the identity of the perfect-cadence-like gesture can easily be seen as a second part of the phrase, especially as it is also texturally quite different. Indeed, this sort of analysis can be a useful guide to the performer who will see this gesture as a new, almost separate part of the phrase: maybe it is significant that Debussy added the only different dynamic mark of this phrase (crescendo) precisely over these two notes.

No comment has been made of the harmony supporting this melody. Could it be significant that the plagal progression accompanying the end of the first phrase has a total duration of 11 (1+10) quavers? It is tempting to think so, perhaps, in that the entry of the left hand divides the first phrase exactly into two equal halves (11 + 11 quavers). However, the quaver is used so little as a unit in the rest of the piece that it is hardly worth attaching much importance to it here.

The first moment of real harmonic importance after the initial base of Gb, is the chord of Eb major at the end of the second phrase (end of bar 6); and it is reached precisely after 17 crotchet units from the beginning and prolonged for 2 beats: although the 18 crotchets that might be expected to represent a significant moment are not marked by an articulation as such, they fall in the middle of this new harmonic area. This area of Eb will be of extreme importance in the rest of the piece.

The third phrase repeats the melody of the first phrase but in the context of a more ambiguous harmony which is “resolved” at exactly the 11+11 quaver division of the first phrase, by a perfect-plagal cadence.

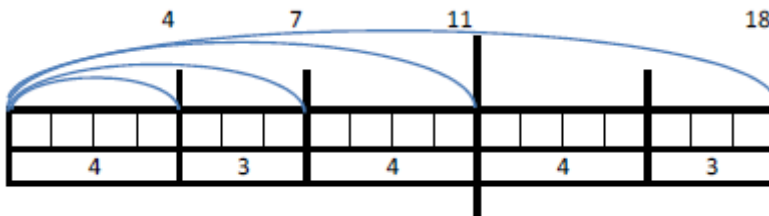
The indication *Cédez* in bar 11 clearly indicates the end of the first section of the piece, which corresponds to the opening 3-phrase melody.

At the indication of *Mouvement* (that is, *a tempo*), the music enters a 7 bar section of proliferation of the various motifs presented in the opening melody. These 7 bars are clearly divided into subsections of 4 and 3 bars each.

Ex.4 Bars 12-18: the 7-bar section following the initial melody

The 4-bar phrase, fundamentally supported by the same harmonic field of Gb, moves – it is tempting to use the rather less objective word, triumphantly! – to the chord of Cb major which joins Gb and Eb to constitute the trio of important harmonic poles used in the piece. This chord opens the 3-bar phrase that will modulate to Eb major again.

This section of 7 (4+3) bars, added to the 11 bars of the initial phrase, brings the total number of bars to 18.

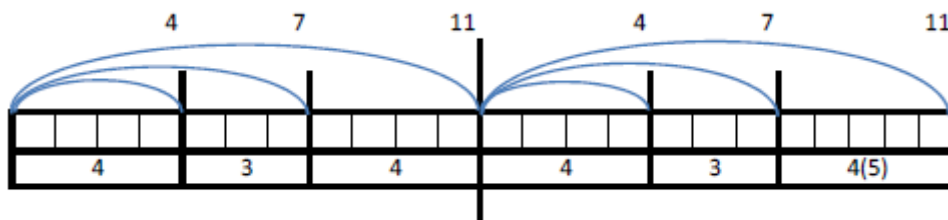


Ex.5 Proportions up to bar 18

At this point, not only does the music reach the important pole of Eb; it also adopts a new, slightly accelerated, speed (*Un peu animé*). This gives the impression that the musical material is new, which lends the previous 7 bars almost the feeling of a bridge passage.

Ex.6 Bars 19-23: the 5-bar *Un peu animé* section

The indication, *Un peu animé*, could prompt the reaction that, from here on, it would be nonsense to carry on drawing conclusions from bar lengths, or indeed crotchet units, since the durations will be different. However, the problem can be approached from a different angle: looking ahead, it is evident both from the indication of *Mouvement* in bar 24 and from the musical material itself (both melodic and harmonic) that, in five bars' time, the piece will return to a context similar to that of the beginning. If we imagine that this passage is to have a significant proportional place in the piece, it becomes possible to speculate that the five bars of *Un peu animé* should be played at a speed that would result in their lasting the same length of time that a phrase of 4 bars would have lasted at the original speed. This possibility allows us to see the form of the piece so far as: initial melody (4 + 3 + 4); section of proliferation and *Un peu animé* (4 + 3 + [4]).



#### Ex.7 Proportions up to bar 23

The possibility that these five bars should be played at a speed that allows them to last the duration of 4 at the original speed, also enables us to calculate a speed for this section: curiously (or perhaps not!) Debussy was quite specific at the beginning of the piece indicating the crotchet at M.M. 66; however, at the *Un peu animé* section, he leaves the new speed undefined. At the proportion of 5:4, the new crotchet could be calculated at M.M. 82,5. In fact, this is a perfectly reasonable result. Indeed, Debussy's indication uses the word *animé* rather than *animez*, which suggests a moment of more immediate *più mosso* rather than a gradual *accelerando*, in spite of what is frequently heard.

This extraordinarily regular structure brings the music back to the Gb of the beginning; it is a return of the Gb-pole without, however, being a recapitulation. There are 4 bars of pentatonically parallel chords that prepare the thematic recapitulation moment.



#### Ex.8 Bars 24-27: return to Gb without being a recapitulation

From bar 28, over a chord of Cb major, we hear the opening melody again: it seems more of an echo than a recapitulation. Indeed these five bars are a sort of *resumé* both melodically and harmonically of the whole piece in that not only is the melody a rhythmically extended version of the opening phrase; the harmonies that accompany it are those of Cb, Eb and Gb, which have been the important poles all along.

Ex.9 Bars 28-32: recapitulation of melody and harmonic poles of Cb, Eb and Gb.

After this recapitulation, there are a mere 3 bars of preparation of the final chord, which lasts 4 bars.

Ex.10 Bars 33-39: preparation and final chord.

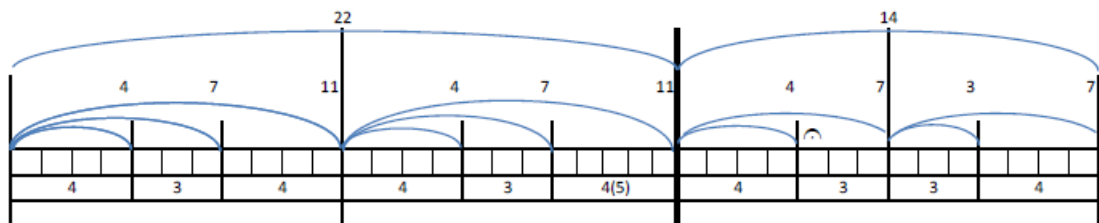
From bar 24, therefore, we could identify another 4 + 3 + 4 bar pattern with the insertion of five recapitulation bars. This would certainly give these 5 bars a special identity and – at least in the mind of the composer creating the work – a certain importance. But why 5 bars?

If the phrase were to be seen fundamentally as a sequence (recapitulation) of the three important harmonies of the prelude (Cb, Eb and Gb), then the first three of the five bars could be seen as a “long-hand” version of a single bar with a pause. This would reduce the five-bar phrase to a 3 bar unit, functionally speaking.

Ex.11 Bars 28-32, reduced to three functional units.

If we accept this analysis – that is, the 3-bar Cb chord functioning as a single bar with a pause – it will be seen that the Cb-Eb-Gb chord sequence ends at functional bar 29, leaving another 7 (3+4) bars to complete the piece with 36 (2x18) bars.

In this case, the second “half” of the prelude can be seen as having 14 bars in all, functionally. This would create a perfect 11:7 proportion between the two “halves” of the prelude, since the first “half” has 22 bars (if we allow that the 5 bars of *Un peu animé*, bars 19-23, count as 4 bars in duration). This creates a perfect Lucas approximation of the Golden Section.



Ex. 12 Overall proportional form.

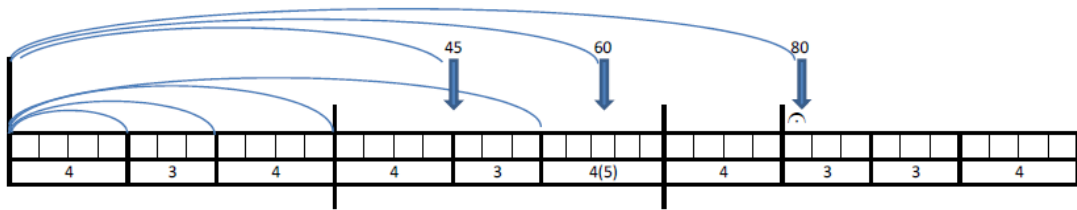
Nevertheless, the question still remains why it should be this Cb chord that is prolonged in this way. Certainly, the recapitulation of the opening melody is one good and plausible reason. However, there could be another reason: by prolonging the Cb chord, the following Eb chord appears after 29 bar-units; this creates an exact Lucas proportion with what must be the most important Eb chord of the piece, which appears after 18 bars.

Finally, it is worth observing the proportions between the highest notes of the piece. The first high note is the Cb of bar 16; the second, the highest of all, is the Eb on the third beat of bar 21 in the middle of the *Un peu animé* passage; the last is the Db in bar 28. Interesting to note is how all three appear over chords of Cb major!

The first of these notes appears after 15 bars, that is 45 crotchets. The second is heard after almost exactly 60 crotchets: “almost exactly” because to be absolutely correct, the Eb should appear a quaver earlier at the exact middle of the *Un peu animé* passage. However, the natural tendency to hurry a little in bars 19 and 20, together with the tendency to hold back a little in bars 22 and 23, more than compensates for this small inaccuracy, giving it the status of being more correct than the exact numerical calculation. Thus between the first two high notes there is a proportion of 3:4 (45:60). The third high note is found after exactly 80 crotchets, which with the 60 crotchets of the second, again produces the same proportion of 3:4 (60:80). These proportions are both derived from the inaccurate integer expressions of the Golden Section that result from the use of the second and third values of the Lucas sequence. This conveniently explains why the high Db of the return of the initial melodic phrase is articulated on the unexpected 3<sup>rd</sup> beat of the bar: the proportional regularity results in a local irregularity or unexpectedness that increases the feeling of flexibility, even of improvisation. This, in turn, lends greater credence to the possibility of regarding the 3 bars of Cb as a single bar-unit with a pause, as suggested above.



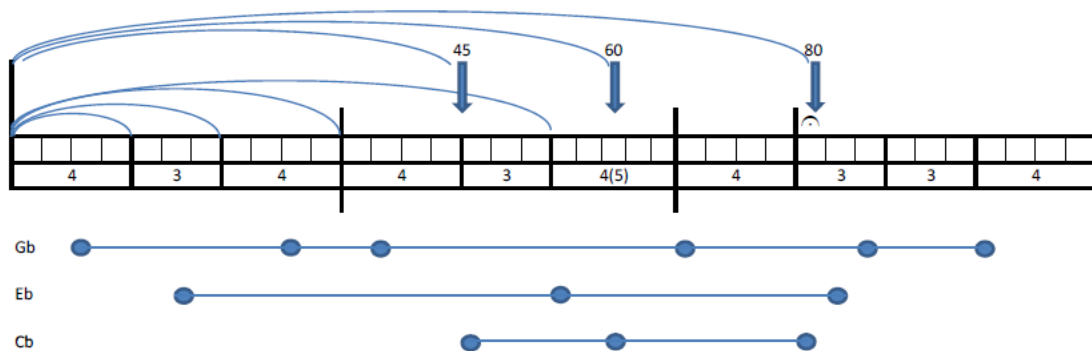
Thus the overall form of the prelude could be presented thus, the high notes being shown as arrows.



Ex.13 Overall form, showing the proportion between the high notes.

It is interesting to note that all the principal relevant moments are directly related to the beginning of the piece, the moment at which musical time begins to exist.

Finally, we could add to the overall formal scheme, the occurrence of the three main tonal poles (Gb, Eb and Cb). It will be seen that, from a starting point of Gb, there is a departure towards Eb and then to Cb in the first part, and a palindromic return in the second.



Ex.14 Overall proportional form, showing tonal structure.

The prelude, *La Fille aux Cheveux de Lin*, is thus not only a gem of apparently intuitive simple expression; it is at the same time a gem of perfection in the sense of mathematical proportion: perfect freedom coincides with perfect control. In the light of this analysis, it will be seen that while wholly in keeping with the principles of the proportion of the Golden Section, Debussy has in this prelude created a slightly more stylized proportional perfection than that which the more exact Fibonacci sequence produces. Is the girl with the flaxen hair slightly distorted, or seen in perspective? Is she smiling or is there a *double entendre* to her portrait? Is she a 20<sup>th</sup> century Mona Lisa? Is there some hidden, even arcane, meaning in the sheer simplicity of this enigmatic piece?

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