two origami for Bb clarinet solo

// by nikolaos-laonikos psimikakis-chalkokondylis

These two small solo pieces represent my ideas on how to draw some parallels between the art of folding paper and music. This process of "folding" is described more extensively in the description of the first movement.

Throughout the piece, I've used the Fibonacci sequence thoroughly. The reason for doing so is because by using numbers to determine various elements of the music I automatically get detached from the music itself, my influences and even my own intentions. Instead of using random numbers, though, I chose to use the Fibonacci sequence to determine those elements because the Fibonacci sequence is an important sequence in mathematics and in nature. An example of the use of the Fibonacci sequence in my piece is in the tempi: the tempo of the first piece is 89 crochets per minute, and the second piece's is 55 crochets per minute, both of which are consequent numbers in the Fibonacci sequence. Furthermore, their sum gives 144, which is an important number in the sequence (144 is equal to 12 squared -and is the first squared number of the series- it is the 12th number in the sequence and Φ, the limit of the ratio between two consequent Fibonacci numbers, is the 21st letter of the Greek alphabet, which is practically 12 inverted) and in the piece itself.

A further reason that I've used the Fibonacci sequence so extensively throughout the piece is because you can actually create a surface whose length is Φ (or at least a geometrical approximation to Φ, as Φ is an irrational number) by a procedure of folding a square paper (**Fig. 1**). Thus, the Fibonacci sequence has a closer relationship to origami than it might seem in the first place.
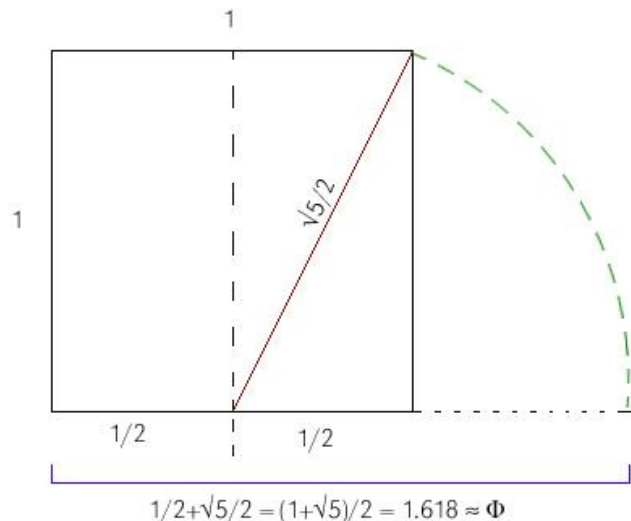

Figure 1: If you have a square with sides equal to 1, and you take diagonal of half the square and draw a line which is equal
to ½ plus that diagonal, it is a good approximation to Φ (algebraically it is equal to Φ, as Φ is one of the two solutions to
the equation $x^2-x-1=0$ - the solutions to this equation being $(1+\sqrt{5})/2$ and $(1-\sqrt{5})/2$)

Lastly, the titles of the pieces are related to the Fibonacci sequence. If one takes the three keywords that exist in the title, they are: *origami, crane, teardrop*. "Origami" is 1+1+2+3 (o+r+ig+ami), "crane" is 5 and "teardrop" is 8. Thus, the titles themselves are part of the Fibonacci sequence (the titles are

given in lowercase because the first movement is not referring to a specific crane but rather to any crane, and the second movement is not referring to a specific teardrop, but rather any one teardrop).

I. crane

The first piece is called "crane" because the crane is the most representative of all origami and thus is a good starting point for a piece which attempts to express "origami" through music. Furthermore, a crane is a bird, and birds are the freer of all creatures. Therefore, to a higher conceptual level, the crane symbolizes freedom, freedom of expression, freedom from society, and freedom from our own intentions and psychology.

This freedom is expressed in the movement, firstly in the free melodic line that guides the first section, and secondly in the absence of barlines and time signatures (as well as the use of numbers to determine the second section).

The beginning of the piece was taken from an experimental piece for flute, cello, and harp that I had started writing a few months ago. In that piece I had written about one minute of music which was completely random (by clicking randomly on Finale to produce notes, then altering the durations, adding accidentals and creating time signatures also randomly). For this movement, I used some of the material that occurred from that "random" piece from all three instruments, and arranged them to suit the clarinet (in terms of range and lines – the clarinet cannot play more than one melodic line as can the cello and the harp).

After modifying the material and adapting it for clarinet, I added some more notes, altered some of the old ones and "shaped" that random material into the first section, which ends on the semi-breve C with the fermata, indicating very clearly the end of the first section.

This is where the idea of "folding" music comes into play.

So far I had 144 notes (I deliberately wrote that many notes, due to the fact that it is an important number of the Fibonacci sequence) and I had to pick one of the two possible middle notes (the term "notes" as used in the text includes rests as well, because rests are merely notes at zero volume. The proper term would be "musical elements", but for our purposes I will use the term "notes"). Then, I would take the first note on the left, then the first on the right, then the second on the left (from the middle note), then the second on the right, and so on (**Fig. 2**)
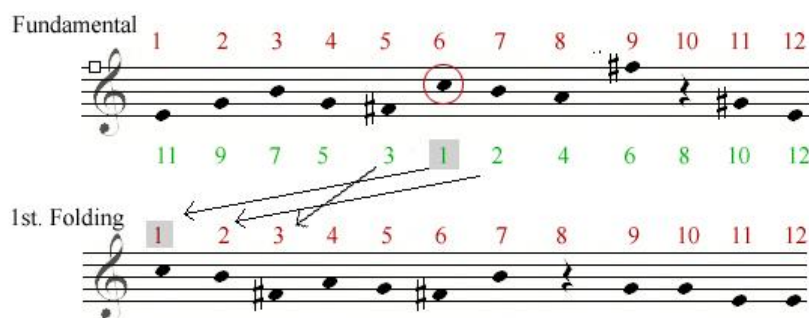
However, had I proceeded with the "folding" process like this I would end up with a second section containing as many notes as the first one, something which I wouldn't particularly like (mainly because I believe that asymmetry has greater beauty than symmetry, and also because no matter how hard someone tries, they will never be able to fold a paper in half **perfectly**). Thus I decided to implement the idea of "leftovers". When making an origami from a rectangular paper, you first have to make it a square paper and in order to do that you cut some paper off the original A4 page. Then, after you finish the origami with the square part, you can make another origami using the leftovers of the A4 page. Hence, I decided to omit some notes in when "folding" the first section into the second one. Instead of omitting notes randomly, though, I decided to omit notes according to the Fibonacci sequence; so, I omitted the first note (1), then the first note after that (1), the second note after that (2), the third note after that (3) and so on (see **Fig.3** – also, instead of removing the 13th note when I reached number 13, I omitted the 1st note after the previous note, and the 3rd note after that because otherwise I would reach the end of the first section very quickly. In other words, I wrote down the Fibonacci sequence and treated each digit as a separate number).

Figure 3: The first line of the piece with numbers above the notes which were to be omitted (according to the Fibonacci   sequence)

After removing a handful of notes, I continued with the "folding" process, but I also paired notes by two and exchanged their durations, thus implying a "folding" at a second level as well. When I finished copying the derived (folded) material, which was significantly less than 144 notes, I copied it back to the original manuscript paper. However, on copying the second section from the draft paper to the original I accidentally forgot to copy 12 consequent notes (because right before and after these 12 notes there was a minim rest, and when I was copying the notes I accidentally jumped from one minim rest to the next one and continued) but I decided to keep the score as it was because the second section now had an element of "chance" in it, a chance that I never asked for or intended to include, which makes the event even more stochastic. Lastly, counting the notes of the remaining second section I found that they were 85, thus I added the first 4 notes from the set of the 12 notes I forgot to copy (which is a second use of the concept of "leftovers" mentioned above) to increase the second section to a total of 89 notes, which is the number in the number before 144 in the Fibonacci (thus, in its total the first movement is divided according to the Fibonacci sequence: the whole piece contains 233 notes, with the first section containing 144 and the second section 89 notes, where 233/144 and 144/89 are approximations of the golden mean, the number Φ).

II. teardrop

The second piece is called "teardrop". The reason for that is because of a symbolism that occurred to me concerning the two pieces. I thought of the pieces as they're telling a story. The first piece tells the story of a crane being "made", paper (initial material) being "folded" into an origami crane. Then, the crane comes to life. However, the crane realises that although it has the potential to be free, the society in which it was created will not let it be free, but rather every individual has an illusion of what freedom actually is. The crane realises that and a teardrop slides down its face.

Why a teardrop? A teardrop is many things. For me, though, it is mostly the expression of "saudade". "Saudade" is a unique Portuguese word that exists in no other language. A Portuguese friend of mine tried to explain the meaning of the word to me by describing it as the feeling of having lost something, wanting to get it back, but knowing deep inside that this is never going to happen. The word was first coined by the Portuguese sailors who, having left Lisbon to explore the New World, they felt nostalgic about their country and wanted to return, knowing, however, that this is never going to happen. So, they expressed this feeling through the tradition of "fados", songs that express that very feeling. I can't find any better expression for this feeling other than a teardrop; not tearing or crying, but rather a single teardrop, full of meaning and nostalcholy.

Interestingly enough, the first Europeans to land on Japan were Portuguese.

For the thematic material of this piece, I used the "leftovers" of the previous piece. That is, I used the 12 first notes that I deliberately omitted in the process of "folding" the first section into the second one (these are the first 12 notes of the first section according to the Fibonacci sequence- see **Fig.3**). I chose to use 12 notes because, a) 12 holds special importance throughout the pieces, as seen in the first piece, in particular, and b) I could draw parallels between my 12 notes and the chromatic scale.

For this idea of drawing parallels between the chromatic scale and a 12-tone row I was inspired by a lecture at the Guildhall School of Music and Drama by composer Nicola LeFanu. She explained some of the techniques she used as a "researching composer" (which is what the lecture was about), and one of those techniques was to draw parallels between the chromatic scale and a 12-tone row, so as to establish some tonal centres on which she would base the harmony of the piece. For example, the 6th and 8th tones of the chromatic scale are the IV and V -with respect to I- respectively; this way, if one took the 6th and 8th tones of another 12-tone row, they could use these tones in similar harmonically structural ways to establish some kind of tonal centre, but by exploring the 12 tones in a different way than the chromatic scale (**Fig. 4**)
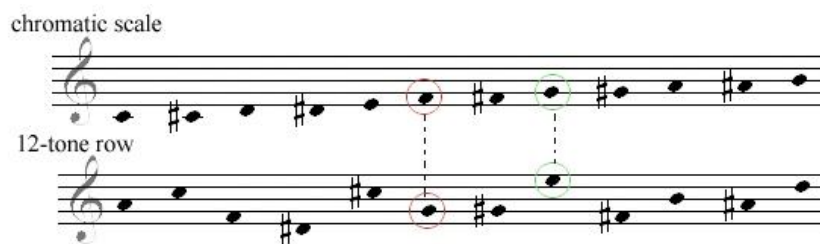
Figure 4: drawing parallel relationships between the chromatic scale and a twelve-tone row. This is a logical process, as one can claim that the chromatic scale is nothing more than a different ordering of the 12 tones (thus the chromatic scale is a 12-tone row itself, and if harmonical centres exist in that row, they can exist in others as well)

So, I had my 12-tone row (although some tones were repeated, some were non-existent, and a rest was also included in the row, because as I mentioned above, I consider rests to be notes) and the chromatic scale, and I circled the 6th and 8th notes on my row. Then, I did the "folding" process on my row, starting from the 6th note and going to the right and then to the left etc, to form a second row, the "1st Folding" of my fundamental row, and circled the 6th and 8th notes on that derived row as well. I continued with the "folding" process until I had 5 "foldings" of the initial row, and thus I had circled 12 notes which, among the rest of the notes of all the rows should have more harmonical importance than them. The derived 12-tone row as well as the process of folding and circling the important harmonical centres in each row are shown in **Fig. 5** .

Figure 5: The "fundamental" row (the 12 notes I omitted in the process of folding), and its first 5 foldings, with the centres of harmonic importance circled, and the derived row consisting of only the circled notes.

It can clearly be seen how only 6 different notes occur throughout the row, and there is also a rest in the row. This row was the basic material with which I'd construct the second origami. Note how the notes of the row (if realigned to be in consecutive order) form a kind of hectatonic scale which is reminiscent of Eastern music and melodies.

For the beginning of the second piece I decided that the duration of the notes should also be derived from the tone row, as can be illustrated clearly in Fig. 6 (the extract from the piece is in transposed a major second upwards, as it is in written pitch for the Bb clarinet):

fundamental row for second piece

first phrase of second piece

Figure 6: The fundamental row of the second piece one top, and the first phrase with pitches and durations derived from the fundamental row.

It is interesting how the row seems to emphasize the augmented fourth, and instances where the fifth and fourth are present seem less structurally fundamental than when the augmented fourth is heard. In a way, the piece "shifts" its harmonic base to a more augmented fourth-oriented harmony -which, though, sounds perfectly fine- and there are even instances where the interval of the 5th sounds more dissonant than the augmented 4th (e.g. The G and C before the triplet).

To continue writing the piece, I decided to use the concept of "folding" once more, and applying it to the fundamental row of the second piece.

I thus created foldings numbers 0 (the fundamental), 1, 2, 3, 4, 5, 6, 7 and 8, and I used (in order of appearance in the piece as well) numbers 0 (the first phrase), 1, 1, 2, 3, 5 and 8 (i.e. The respective "foldings" according to the first numbers of the Fibonacci sequence). After writing those down, but changing durations at will this time (so as to shift harmonical weight from C and F# to other notes, as well as to variate the piece in terms of rhythms and flow), I had two choices for the ending: I could either end with the 4th folding (which is the 13th in modulus 8 -i.e., number 9 would be the fundamental row, number 10 would be the 1st folding and so on) or with the fundamental row itself (which is the 13th folding had I constructed 12 foldings, and thus the 13th would be the first one again, which is the fundamental row). I couldn't make a choice, however, so I included both in my piece and the performer is free to choose either one of them, or even both of them (in which case the semi-breve of the first ending should be played as a minim so that there is more flow towards the ending).

At one point while writing the second piece, I started thinking that maybe I should deviate from using just those 6 notes that the derived row included, in order to make the piece less "boring" to the ears. However, after giving some more thought on the subject, I decided not to include a single more note than the ones that already existed, because I thought that 6 notes is not a limited number of notes to have in a piece of music. Not more limited than the 12 notes of the chromatic scale are a limitation of the continuum of frequency and thus sounds. Therefore, I refused to comply with the average Western aesthetic on music, which is that if music contains less than the 12 tones it's "boring", and if it contains more (quarter-tones, eighth-tones etc) it is "dissonant". Besides, Chinese and Japanese music uses scales with 5 or 6 notes and just those notes, and they don't find their music boring (though many people from Western societies would find it quite "boring" and "not going anywhere", as I used to think about that music myself, until I listened to it a lot of times when it started being more beautiful and meaningful).

Furthermore, the "bending" of tones is something I added to some notes to increase interest. Just like in Eastern music (and thus Japanese as well) they treat each note as an important note in itself (not just in relation to the others), and they do that by exploring all the sounds of that note (i.e. By bending the notes a lot, by playing adjacent notes, by using different dynamics and expressions of the same note, different ornamentation etc), so in order to give a more Eastern feeling to the second piece, I added a "bending" effect. The indicated bending on specific notes is by 3 quarter-tones downwards, but the performer is free to bend any other notes by one quartet-tone, either upwards or downwards, to enhance this Eastern and more "free" (as in, not being "fixated" on the 6 tones) feeling.

// Practical Performance Issues

There weren't any difficulties in the performance of the second movement, as it is very simple and slow, but there were a few difficulties in the performance of the first movement. Firstly, some leaps across the "break" of the clarinet were quite difficult to perform in tempo, although after a few plays the player was able to play them. Also, the grace notes which covered a big range were a bit difficult to perform with the dynamics indicated. The performed mentioned how she found it difficult to read and play music without barlines/measures/time signatures but that is a problem that is overcome with practice.

In the second movement, initially I had use a symbol of my own to indicate the bending of the notes, but I was told to use more widely-accepted symbols for bending the tones, so in this revised version of the piece I have written out the bending of the tone, and in the consequent tones that are to be bent I just wrote "as before", which should be very clear to any future performer.