Symmetry and dissymmetry in Sonata Nr. 4 for piano by Dan Dediu

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Abstract: - The Piano Sonata no. 4 by Dan Dediu stands out on one hand by widening the means of expression of both instrument and performer, and on the other hand, with particular attention to develop elaborated architectural structures. Thus, appears the idea of overlapping of multiple architectural plans, which combine sonata, the theme and variation and the suite with palindrome sequence of elements. Although, this arrangement announces from the beginning a form of mirror symmetry, the interior structure, through obvious inequality between movements, indicates a deliberate asymmetric form, generically named dissymmetry. Even if the principle of dissymmetry is used in order to break the equilibrium, by superposition it can lead to the emergence of other types of symmetry, such as the symmetry through the golden ratio.

Key-Words: Symmetry, dissymmetry, palindrome, golden section.

1 Dan Dediu

The composer Dan Dediu (born in 1967) stands out as the most well-defined personality from the group of his generation. In addition to a rich compositional activity, Dan Dediu fully manifested in pedagogical plan and publishing, being nationally and internationally recognized. The composer’s creative personality is productive and is expresses almost the whole spectrum of possibilities of the contemporary trends, being able to express in a variety of genres and formulas such as instrumental, vocal, and vocal-instrumental, combining various sources of inspiration (music, literature, painting, etc.) or reconsidering the elements of tradition and modernity. His work is made of a great variety of genres including four symphonies, symphonic pieces, instrumental concerts, choral works, and various chamber music for different groups of instruments (five string quartets, four piano sonatas, lied compositions, duos, trios, octets) electronic music, ballet and opera.

The composer Dan Dediu is directly connected with the national and international musical reality through various studies, essays, articles, scientific papers, conferences, papers, radio and television broadcasts, but also through his creations presented in concerts, recitals and recordings.

2 Sonata Nr. 4 pentru pian

Sonata no. 4 for piano op.60 was written in 1996. This remarkable opus stands out on one hand by widening the means of expression of both instrument and performer (off keyboard strokes and finger snaps) and on the other hand, through by a special attention for the development of elaborated architectural structures. Thus, one can observe a certain concern for the development of some architectural structures in which overlapping of genres and forms is possible, reaching a form of hybridization. The composer is set to obtain an interwoven architectural structure by overlapping genres and forms, reaching a form of hybridization of these genres and forms. Through this tendency one can say that the work may be positioned within the postmodern current, where this type of structural evolution is the one of characteristic features.

In The Piano Sonata no. 4, the idea of overlapping several architectural plans is mentioned from the beginning, by indicating three possible formal patterns in the introductory part. Thus, the work which can be associated to sonata (as genre) having three constituent movements, can also be classified as a theme and variations or can be imagined as a suite in which the nine sections that compose it, are displaying a palindrome sequence. From the beginning, this work starts for performer...
as well as analyst as a challenge to discover the
three patterns that coexist and complete each other.

Fig. 1

Sonata as a genre, results from the work
delimitation in three movements: the first movement –
the first four sections, the second movement – the
fifth section, the third movement – the last four
sections. Another possible indication of the
approach to the sonata genre can be represented by
the structure of the second part, which follows an
element characteristic to the genre through the
succession: Menuet - Trio - Menuet.

If one approaches this work as a theme and
variations then one must consider the first
movement of the piece as the theme. It is
distinguished by a high potential for development,
favored by the many musical ideas to be developed
and processed. In this context, the composer express
that all these musical ideas, which appear in the
theme and are be developed over time, act as a
“mixture of seeds, the seeds that will bear fruit in
the variations”[1]. Therefore, the theme is
composed, from a variety of musical ideas with a
distinct meaning (we might call them motifs),
almost independent, which form together an
overview of pieces from a puzzle. These can be
identified throughout the work as variations, which
appear very close to the original form, then
developing and evolving along with other musical
ideas, creating new musical images, distinct
structures from an aesthetic point of view and with
other forms of structural organization such as aria,
fugue, caprice, etc. The ingenuity of construction is
precisely the ability of evolution and metamorphosis
of motifs that have a greater freedom of movement
and assembly, thus offering the possibility of
achieving different constructions that can lead to
different images, which evolve from same
component elements, the same raw material.

The third construction principle, the suite, hides
in fact a form of mirror symmetry, recurrent at
aesthetic level, denounced by the palindrome
sequence of movements. The nine sections of
the suite are designed as complementary: the first
and last movement - Fantasia, the second and the
penultimate movement - Fugue, the third and the
seventh movement - Aria, movements four and six -
Caprice. The fifth movement is made to turn into a
recurrent form: Menuet - Trio - Menuet. In this way,
the middle movement (Trio) becomes not only an
axis of symmetry for this part, but for the whole
work.

Fig. 2

3 Types of symmetry

However, it should be noted that additional
movements are made assuming a correlation,
particularly at the aesthetic level, without an
intention of integral or recurrent resumption of the
musical content, but rather a return to some form of
expression, to an image given by some type of
writing described above. An argument for these
assertions is provided by the size of the sections,
although they meet from an aesthetic point of view,
they display different sizes. To represent, observe
and compare their size, we appeal to determinate the
exact length by relation to the second time unit
following the tempo and the time unit indicated.

Fig. 3

3.1 Dissymmetry

Although, the palindrome structure of the piece
announces from the beginning a deliberate form of
mirror symmetry, the interior structure, through the
obvious inequality between sections indicates a
deliberate asymmetric form, generically named as
dissymmetry. The term was used by Roger Caillois
in his work La dissymétrie to designate a
phenomenon complementary to symmetry. He
believes that the whole mechanism of universal
dynamics is based on the existence of the pair
symmetry - dissymmetry. Thus, the dissymmetry is
presented as a rupture of equilibrium which is not
accidental, being carefully prepared by its creator.

The dissymmetry can be defined as a
construction process in which an intentional
nonsymmetrical form is achieved, as a response to a
mechanical symmetrical form. This controlled
non-symmetry represents a further step to the actual
principle of symmetry to which it is permanently compared.

From an artistic point of view, the need to dissymmetry arises from the necessity to avoid the monotony of a predictable symmetry, in favor of free construction for the benefit of the artistic creation process. The effect of novelty, of surprise to an implicit form of a symmetrical sequence is brought through breaking symmetry.

Dissymmetry can sometimes mean the modified resumption of the image of an object previously described. The expression of new versions of an object already “known”, from another perspective, creates an illusion of movement, leading to some form of spatialization in a temporal discourse. This adjusted repetition can be sometimes perceived as a subjective aspect of an objective image previously presented, offering a different perspective.

Although, this principle is based on artistic inspiration and not on intentional scientific construction, it can lead involuntarily, by approaching a tacit aesthetic standard towards other types of symmetry, deducted by the creative personality in the process of creating the artwork.

Even if the principle of dissymmetry is used exactly in order to break the equilibrium, by overlapping, it can sometimes bring to a symmetrical sequencing, the same way as in a composition where the asymmetric measures can generate symmetrical organizations on the higher level of structures. It can sometimes lead to superior ordering by organizing various types of symmetry at different scale size, as for instance symmetry through the golden section.

Following the sizes of movements presented above, we can say that each has different dimensions, something that can be observed also by comparing the complementary movements. However, this inequality hides a hierarchical ordering at a superior level of structure, depending on the place and the role it occupies in the general plan of the piece. This results from grouping in pairs the complementary sections. It should be noted that this process can only be seen in the analytical plan during interpretation or audition these comparisons and equivalences are not noticeable.

<table>
<thead>
<tr>
<th>Couples</th>
<th>Sections</th>
<th>Seconds</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fantasia</td>
<td>1 + 9</td>
<td>174,5” + 184,5”</td>
<td>359”</td>
</tr>
<tr>
<td>Fuga</td>
<td>2 + 8</td>
<td>103,4” + 147,6”</td>
<td>251”</td>
</tr>
<tr>
<td>Aria</td>
<td>3 + 7</td>
<td>151,2” + 64”</td>
<td>215,2”</td>
</tr>
<tr>
<td>Capriccio</td>
<td>4 + 6</td>
<td>82,2” + 58”</td>
<td>140,2”</td>
</tr>
<tr>
<td>Menuets</td>
<td>5</td>
<td>45” + 43,5”</td>
<td>88,5”</td>
</tr>
<tr>
<td>Trio</td>
<td>5</td>
<td>30,6”</td>
<td></td>
</tr>
</tbody>
</table>

By correlating the corresponding sections a superposition of the movements in pairs arises, their dimensions decreasing gradually towards the center represented by the middle of the fifth movement (Trio), which acts as an axis of symmetry. Schematically, they can be represented as a pyramid with its base formed by the pair of the outer movements (the first and the last) the top being the center of the median part:

Fig.4

### 3.2 Symmetry by golden section

As we have seen, the inequality of sections within the same plan can generate, at a superior level, to closeness to other forms of symmetry. A practical example for this regard is provided by the internal organization of the fifth movement of the suite, in the sequence Menuet - Trio - Menuet that holds a symmetrical relationship based on the principle of the golden section. It must be said that the second menuet is actually the repetition of the first, except that in the end it gives up the last measure. Shortening it with one and a half second generates changes to the general architectural structure, because it changes the size relationships arising between the constituent parts of the movement. These changes bring at a superior level of structure a closer approach to the golden ratio of the relation between the sections.

Fig.5

Although, the ratio between the first Menuet and Trio corresponds to that of the terms 3 and 2 of the Fibonacci sequence (45 / 30,6 = 1, 4705 ≈ Fibonacci 3/2 = 1, 5), to an upper scale of structure, this ratio is not preserved (Menuet + Trio / Menuet): 75,6 / 45 = 1,68. The repetition of the shortened Menuet will make the relationship between the parties on this
size scale become closer to the golden ratio (Trio + Menuet II / Menuet I): $74.1 / 45 = 1.64$. The relationship between the whole and the component parts indicate the same situation, favorable to adjustment of the Menuet at repetition, in order to get a better approach to the symmetry by the golden ratio: $(119.1 / 45 = 2.64 \approx \phi^2$ and $119.1 / 74.1 = 1.60 \approx \phi)$. An identical repetition of the Menuet made this ratio to move further from the golden ratio: $(120.6 / 45 = 2.68$ and $120.6 / 75.6 = 1.59)$.

Another example comes from the analysis of the work seen in the light of the sonata genre. The division of the piece into three sections (A = 511.3 seconds, B = 119.1 seconds, A = 453.9 seconds) that correspond to the structure of the sonata as a genre, shows again another form of symmetry by grouping movements according to the formula $4 + 1 + 4$.

On the other hand, the organization of the second part provides an important clue for the discovery of a type of symmetry based on the principle of the golden section that can be found in the organization of the whole work. The ratio that arises between the first Menuet and the Trio ($45 / 30.6 = 1.47$) has a value that is close to the golden ratio corresponding to fraction $3/2 (= 1.5)$ of the Fibonacci numerical sequence (1, 2, 3, 5, 8, 13, 21, 34, 55, 89, etc.). Similarly, the ratio between the first and the second part - A / B - ($511.3 / 119.1 = 4.29 \approx \phi^3$) corresponds to the relationship between numbers 13 and 3 ($13/3 = 4.33$) of the same numerical sequence whose approximate value indicates $\phi^3$.

**Fig.6**

It has to be noted that all these types of symmetry or asymmetry discovered over the course of the piece are the result of aesthetic searches, arising from the act of creation. These scientific approaches of the artwork are the result of analytical associations, without being the main goal of this work.

**4 Conclusion**

Unlike mirror symmetry, which, due to the palindrome form of the suite is emerging as an intended construction principle, the symmetry by golden section is derived from the musical discourse as an unintended effect of aesthetic achievement. In the piece, the composer sought particularly the poetic idea, without any intent in this regard towards the strictly mathematical organization, of the musical material.

In *The Piano Sonata no. 4* the principle of dissymmetry and symmetry are overlapping, drawing together a complex and advanced picture of the principles of symmetry. This is reflected, on one hand, through a palindrome organization of the component movements, without an inverted or identical repetition of the musical material previously presented, but on the other hand, as an addition to the artistic vision through the return and the deliberate change of poetic images from previous ideas, through dissymmetry used as a process of controlled asymmetry.

Dissymmetry appears as a justification to the conditioning dictated either by specific patterns of construction that the composer himself had made, or by the monotony of a predictable symmetry. This gives a more free movement, favoring the liberal construction for the benefit of the process of artistic creation. It sometimes acts as a form of spatialization by presenting several variants of the same poetic image, resembling to a view from different perspectives of the same piece of art.

*The Piano Sonata no. 4* was the subject of several concerts and recitals held in the country and abroad, along with other known works for piano such as *Idile and Guerrille* or *Lévantiques*, belonging to the same composer. In 2007 these works, interpreted by the composer together with Valentina Sandu-Dediu were recorded on a CD, appeared at Neos Music in Germany [2]. In the music composed for piano (at one hand, two hands, four hands) on this CD, beyond symmetries and dissymmetries, we will all discover the fascinating piano world, luxuriant, with multiple and subtle references to the great musical tradition, yet proposing a new sound of the piano. Frequent appearances in concert and recital programs of *Sonata no. 4 for piano* by Dan Dediu, demonstrates once again the undeniable value of the piece which remains, from this point of view, one of the works of reference of the composer, whose personality it reveals and represents.

**References:**

[2] CD Dan Dediu, 01-06 *Idyllen und Guerrillen* op.76 for four hands; 07 *The Grasshopper* op.112
for the left hand (and...); 08-10 from the cycle Lévantiques op.64; 11-19 Sonata Nr.4 op.60; 20 Les barricades mystérieuses – reloaded, Neos Music GmbH, 2007.

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