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The Practical Analysis in the Theory and Technology of Serial Music Composition

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Abstract
With the rapid development of social economy, people's material life has been met. Meanwhile, the vision gradually transferred to the spiritual needs. The music is regarded as a way to relax and the serial music has been seen to have relatively large influence on music creation. Based on the a brief overview of the serial music and discusses the relevant basic principles, this paper takes *Pick Lotus in the River* for example and analyzes the practical effect of serial music, including the sequence types and structure , the common sequence method and melody writing.

Key words: Serial music; Music creation; Music type

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INTRODUCTION
With the increasingly high demand for talent, most people choose music as a way to relax when they face a lot of work pressure every day. In fact, serial music belongs to a relatively fixed music that is generally created by the fixed order, and this technology is wide-applied in high-pitched voice. At present, though many scholars have studied the serial music, there is not enough research on its application in the works. Therefore, this paper has extremely important significance.

1. BRIEF INTRODUCTION OF THE SERIAL MUSIC

1.1 Serial Music
Serial music can also be called the serialism, as it is a very important genre of the western modernism. On the basis of the relevant provisions, it would complete the whole process of music creation to set the parameters in the music by using the mathematical permutation and combination method. Compared with traditional music, serial music has some differences, in the theme, music or phrase, logic, which has become one of the main methods of composition in China. Based on the original material, serial music obtains the set sequence through the corresponding arrangement of parameters, which are used repeatedly in the whole music, and it also needs to take the form-changing measure to deal with it.

1.2 Dimensions of Serial Music
The main components of serial music are timbre, rhythm and pitch, which are the 3 basic dimensions. The pitch, namely, the different voice with its undulations and inflexions, can also be called the height of the sound, which is a basic characteristic of the music itself and depended on the vibration frequency produced by the voice prosthesis. The relationship between the pitch and the vibration frequency is positive proportion. When the vibration frequency is increasing, the height of the sound will be increased, and vice versa. However, the pitch is a variable, and change forms are continuous change, which the human ear can only hear between the frequency range from 20Hz to 20000Hz. Rhythm, actually a kind of rhythm, which has a certain law in the speed of change, at present, is more commonly used beat 4/4 beat and 3/4 beat. The 4/4 beat is a four notes as a beat, and each bar is made up of 4 beats, while the 3/4 is the one that takes the four notes as a beat, but each bar is made up of 3 beats. No matter what kind of beat is, the corresponding value

is the same, which usually takes two points as the main form to make an effective separation of the rhythm, so as to improve the stability and familiarity of the rhythm. Generally, we can understand the timbre as a characteristic of the sound. Each sound not only has some differences with other individuals in the structure, but also is different from other individuals in their own materials. Therefore, for the voice, the corresponding sound is unique, which we can distinguish based on the different sound to effectively identify. Timbre, a feature of sound, can also distinguish the voice prosthesis based on the sound even if the sound intensity and pitch are exactly the same.

1.3 Rules of Serial Music

Serial music rules are based on the basic dimensions of serial music and standard. According to different dimensions, serial music will comply with the appropriate rule, so as to ensure the integrity and rigorism. This paper mainly introduces two kinds of serial music rules: dial rules and the mirror rules.

1.3.1 Dial Rules

In fact, the dial rule, namely, a note sequence, based on the previous specified note sequence, is added at the later specified position to form a constant. For instant, when adding clockwise number and the counter clockwise, the results will always be 12. That is the pitch dial rules of serial music chart as shown in Figure 1.

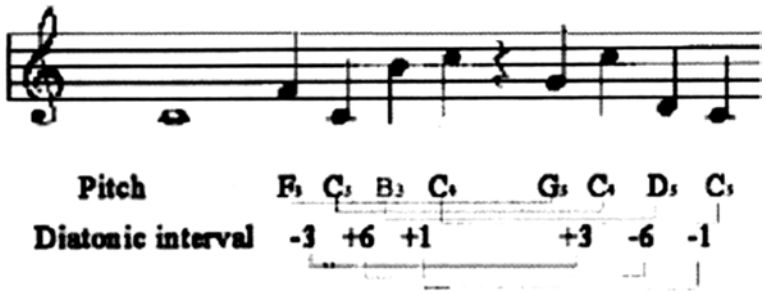

Figure 1
The Pitch Dial Rules of Serial Music Chart

It is found through observation of Figure 1 that the result is zero when adding the corresponding note number of the first voice and the second and the corresponding note number of the fifth and the sixth. The result is zero when adding the corresponding note number of the second and the third and the corresponding note number of the sixth and the seventh. The result is still zero when adding the corresponding note number of the third and the forth and the corresponding note number of the seventh and the eighth.

1.3.2 Mirror Rule

To understand the rules of the mirror literally, just as people look in the mirror, there is a person who is completely opposite to the mirror in the mirror, and the mirror rules are similar in the serial music. For a whole note, there is an inverse relationship between the note sequences in the first half and the note sequences in the second half, that is to say, they are in the opposite position. That is the mirror rule of the serial music as shown in Figure 2

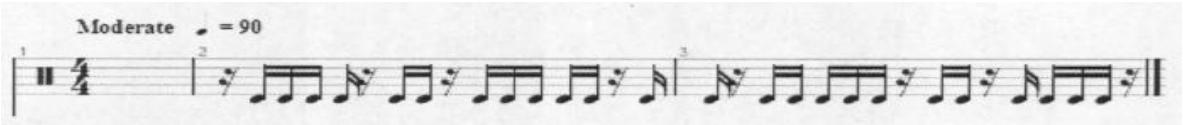

Figure 2
The Mirror Rule of the Serial Music Chart

Taking the first notes in the third bar as the boundary, it is found through the observation of Figure 2 that there is totally opposite relation between the rhythms in the second bar and the third bar, liking to face a mirror.

1.4 The Basic Principle of Serial Music

This paper is researching not only the twelve tone music, but also the total serialism. And then, corresponding basic principle of these music is discussed in detail as follows:

Firstly, there is discussing the basic principle of twelve tone music. In consideration of serial music technology, twelve-tone music has relatively high requirements whose main contents are as follows:

(a) In the chromatic, according to the corresponding rules, twelve halftones are selected as a sequence of elements to establish a sequence of special. It needs to be stressed that it cannot be completely on their own terms, but ensure that the work must be combined with a certain equality and pledge twelve semitones position can be in equal status. What's more, if a half note of twelve half notes appears, the rest must appear which must make sure that there is a repetition until they appear completely, so as to ensure the creation can not form a center.

(b) Any note in two halftones, except unified sequence, can not be omitted, That is, in a sequence reincarnation,

one note, before the next note to appear, can appears in different positions or used in the same position at octave, which abide by the principle of repetition.

(c) The ways are reflected in four kinds in the system of the twelve tone, retrograde reflection mode, prototype mode, retrograde mode and reflection mode. Using the four modes, would ensure the repertoire is in compliance with the relevant requirement while they applied to a different pitch in the twelve tone in the writing. Therefore, in every composition, all forms of notes have four kinds, as a result of which are 48 tones.

On the basis of the pitch, leading to the basic principle of the serialism, expanding twelve tone pitch, would obtain a result with the integral characteristic while taking the corresponding treatment. In the process of the serialism, there is no requirement for the factors of the order, which can also be taken to the corresponding treatment measures even if they are different kinds. Meanwhile, if the relationships are the same between factors, the serialism can be completed in a limiting way. No matter which method is used, it is necessary to ensure different types of factors can be integrated, so as to achieve the unity of theoretical relations and then achieve the purpose of the overall control on the work.

The above content of this paper is mainly a brief overview of the serial music, including the serial music, the 3 dimensions of serial music and 2 rules of the serial music as well as the basic principles of serial music. And then, this article will discuss the specific practice of serial music.

2. THE SPECIFIC PRACTICE OF SERIAL MUSIC

This paper discusses the concrete practice of serial music from three levels, including the sequence types and structures, the common sequence methods and melody writings.

2.1 The Sequence and Structure

Taking *Pick Lotus in the River* for example, this paper selects a relatively complete twelve tone sequences to complete the corresponding content, which involved in 29 bars. According to the twelve tone technique to complete the composition, there are the inverted RI and retrograde R, in addition to the inverted I and the prototype O, which are applied to 4 sentences in a certain order, so that the melody can be completely, correspond with the 4 sentence lyrics and structure can be more regular. The prototype is applied to the first sentence and the sequence is used to the second sentence, while the third sentence is a sequence reflection and the last sentence is applied to a sequence of inverted reflection. This study belongs to the five acoustic sequences. Modes in traditional five tone sequences, with relatively complex interval structure, has a certain particularity, so it can not used the major seventh, the minor second and the tritone, but used the mistress in the writing, which can also apply the minor second in necessary cases. When using the twelve tone sequence, twelve half notes must appear in the same composition without any chromatic phenomenon. Therefore, in the creation, the five acoustic characteristics must be highlighted, while using various processing methods to arrange the sequence, so as to realize the color desalination and corresponding influence. For instant, when sorting the sequence prototypes, tritone can not occur between two adjacent or a separate tone. The tritone, however, can appear, when there are two separate tones or from c-sharp to G. In the whole sequence, when appearing major seventh, the adjacent position does not appear minor second. With a Separate tone in the sound processing, it can appear a group of Minor second, which needs E-flat and D and is weak compared with minor second sound effects and other sound effects. Therefore, it can be called the five tone sequence when appearing many five tones in the sequence.

2.2 Common Sequence Methods in the Serial Music

The PICK LOTUS IN THE RIVER used 3 sequence methods falling into the segmentation method, the vertical and horizontal method and the overlapping method. This paper mainly discusses the first two methods. The application of vertical and horizontal method is mainly reflected the existence of the sequence, so that the audience can clearly feel the sequence in normal operation. First of all, the musician needs to ensure that all the sounds in the prototype sequence O of the staff ,which is from the 1st bar to the 3rd bar can be presented in time. And then, they must made sure that all the sequences of the retrograde R are presented from the 3rd bar to the 5th bar, as a result of which forms a sequence of up to 24 tones with a total of twenty-four tones. It needs to be stressed that the formed sequence has a certain integrity, which audience can feel in the introduction part. In addition, the vertical and horizontal method is applied to piano part from the 14th bar to the 16th bar, which renders all sounds in the corresponding order. First of all, 9 notes appear corresponding with the prototype. Next comes the 6 tones corresponding with sequence reflection I. The segmentation is applied to obtain a complete sequence prototype O, which is used in sixth bar, seventh bar and eighth bar. The 7th bar does not need the twelfth tone, the eleventh tone as well as the tenth tone, while a prototype O sequence needs to be form in the 9th bar. For the 10th bar, the segmentation needs to be applied to three parts, so as to form all twelve tones of the retrograde sequence R, and the prototype O sequence is mainly applied in11st bar. In order to form complete retrograde sequence R in the 12nd bar and 13rd bar, it is necessary to apply not only the sound of the latter 6 positions but also the first 6 tone

in the retrograde sequence. The twelve tone corresponding to the sequence reflection I is respectively applied to 3 voices in 18th bar and 19th bar. The distribution of the 20th and the 21st bar is the same as the 18th bar and the 19th bar. However, there are some differences, that is to say, the 20th bar did not use the tenth tone, fifth tone and forth tone, while the 21st bar did not use the fifth. The 23th bar and the24th bar are using the twelve tone corresponding to the reflection of inverse sequence RI in three voices. The 25th bar is similar with 24th bar, which do not has ninth and octave, and there are the same triad from 27th bar to 29th bar, so that they can form a reflection sequence I and a reflection of inverse sequence RI

2.3 The Melody Writing in the Serial Music

When expressing the feelings of the author, the melody plays a vital role in the composition. According to the showing melody, audience can intuitively feel the expression of the author's feelings.In order to fully reflect the rhythm of the series music, it can apply the composition of the principal and the corresponding technology. This paper analyzes melody writing of the *Pick Lotus in the River* where repeat tone appears in the relating vocal melody part that meets the requirements of musical melody. With two G-sharp in the 13 bars, the composer adds a B tone to meet the requirements. There's a continuous tone in this composition, however, it complies with some requirements, namely, all sounds must appear at the same height. In the 20 bar, multiple notations are used to write E-flat and D-sharp. However, the corresponding sound effects are also repeated in the same height. In addition, this composition is also very neat in the rhythm with much quarter note. In the 19 bar and the 23 bar, respectively appeared half-note, quarter note and quaver. As the spasm and the artistic conception are inhomogeneous, unfitting for the modern rhythm, the author chose the traditional rhythm. Besides, the selected tone is much melancholy and the interval most are conventional minor interval that are below the third interval. In the interval, the major interval, especially the interval above octave, rarely appears. To reflect the climax of the whole music, the sixth interval is used in 18th bar, 19th bar and 21st bar, which has a relatively large span. Viewed as a whole, all the melodies used are traditional melodies.

CONCLUSION

Serial music has a great influence on the development of Chinese music, both in terms of composition theory and technology. In the whole process, musicians can be not only to prepare the settings before the creation, but also to control all the parameters. Taking the *Pick Lotus in the River* for example, this paper analyzes the practical effect of serial music in the works from three levels, including the sequence types and structures, the common sequence methods and melody writings.

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