

The New Interpretation of Melody and Rhythm from the Perspective of "Kinetic Energy Theory"—Based on Ernst Kurth's Grundrissen des linearen Kontrapunkts

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Abstract: *Ernst Kurth (1886-1946), as one of the representative theorists of the "Kinetic Energy School" which was established at the beginning of the last century and focused on the formal Theory of the dynamic nature of music, proposed comprehensive and specific "Kinetic Energy Theory". In Grundrissen des linearen Kontrapunkts, the first book in his "Kinetic Energy" series, Kurth, while analyzing the compositional techniques and styles of Johann Sebastian Bach's polyphonic works, also makes a new interpretation and interpretation of "melody" and "rhythm" from the perspective of "Kinetic Energy Theory", which is different from traditional theory. The theory still has great research prospect and value for our country's current music theory research.*

Keywords: Kinetic energy theory, Kurth, Linear counterpoint, Music analysis.

1. Introduction

The emergence and development of the disciplines of psychology and anthropology have had a profound impact on almost all fields in the 20th century, including music. The study of music theory has become increasingly comprehensive, particularly with regards to considering "humans" as active subjects. Additionally, new related disciplines such as Ethnomusicology and Music Psychology have also begun to develop. Towards the end of the 19th century and the beginning of the 20th century, the formal establishment of "kinetic energy theory," which focused on the dynamic nature of music, saw significant development alongside numerous other disciplines during the 20th century. This theoretical school's research centers around "movement" and "perception," delving into the inner movement within music while studying its deep state under traditional elements' representation as dynamic events. Furthermore, by analyzing and studying concepts like "energy" and "movement" in physics, this theory also emphasizes mental perception within each individual involved in music practice—from composer to listener—proposing that both musical "movement" and human's "mental perception" form a unified whole.

Among the many theorists who contributed to the establishment of "kinetic energy theory", the position of Swiss music theorist Ernst Kurth (1886-1946) can not be ignored. During The period when "kinetic energy Theory" was established, Kurth, with his clear explanatory logic, elaborated his "kinetic energy theory" and its analytical application to works in several treatises—The Requirements for a Theory of Harmony Harmony (1913) can be seen as the starting point of his main line of Kinetic Energy theory. In this essay, Kurth advanced important ideas such as a "psychological explanation of chords" and the idea that melodies have "Kinetic Energy" and chords have "Potential Energy". In the wake of this, In the three most important works of Kurth's research career, he started from the three traditional concepts of "melody", "harmony" and "musical form", which have been studied extensively, and centered on J.

S. Bach (1685-1750), Richard Wagner (Richard Wagner) Wagner (1813-1883) and Anton Bruckner (1824-1896), the works of these three composers, gave a more specific elaboration of his kinetic energy theory.

The first of Kurth's three representative treatises, Grundrissen des linearen Kontrapunkts: Einführung in Stil und Technik von Bach's melodischer Polyphonie was a controversial work in the West, Many influential music theorists and critics of the time, such as Hugo Riemann (1849-1919), were skeptical, if not vehemently opposed, to Kurth's ideas. However, Kurth's work on linear melody, kinetic energy theory, and polyphonic styles was highly appreciated by many music theorists such as August Halm (1869-1929).

In the early 20th century, Kurth introduced the concept of Linear Counterpoint, and in Fundamentals of Linear Counterpoint, he emphasized the use of the concept of horizontal linear motion in counterpoint to study the progression and development of voice parts. Through the composition theory course opened by Huang Zi and Xiao Youmei at the Shanghai National Academy of Music by German musician Wolfgang Fraenkel (1897-1983) at the end of 1930s, Linear Counterpoint Foundation was introduced as a polyphonic textbook and put into use in China. This treatise consists of five parts, which can be roughly summarized as "the theory of Kinetic energy", "the history and style of polyphony" and "the writing techniques of linear counterpoint from the perspective of Kinetic energy". The whole book revolves around Bach and his works. In the first part, Grundlagen der Melodik, Kurth first focuses on a series of theories of linear melody movement, and discusses its origin from the perspective of "kinetic energy" from the generation of melody. In this section, he discusses in more detail the core concepts of "melodic energy" and "rhythmic energy", "kinetic energy" and "potential energy". In the second part, Das Problem des Kontrapunkts, Kurth focuses his attention on the level of "history and style of polyphonic music". After reviewing and summarizing the existing counterpoint theory, Kurth discusses the basic characteristics of linear design, the

historical evolution of counterpoint problem. In particular, he comments on the method and counterpoint practice of Fux's system principles. In the third part, Bachs melodischer Stil, Kurth makes a detailed analysis and theoretical summary of Bach's polyphonic style and techniques. In the last stage of the book, Kurth combined the linear melody, polyphonic style and techniques discussed previously from the perspective of "kinetic energy theory", and made a more in-depth discussion on the thematic movement, the dynamic relationship of polyphonic tone, the dynamic reinforcement and the writing of two-part counterpoint.

Based on the study of Ernst Kurth's "The Basis of Linear Counterpoint", this paper attempts to explore the feasibility of applying kinetic energy theory to the analysis of musical works. The paper combs out the two crucial musical elements of "melody" and "rhythm. On the one hand, According to Kurth's theoretical analysis logic, this paper discusses his theory of linear melody and rhythm rhythm from the perspective of "kinetic energy theory", explores the differences and connections between the two and the interpretation of traditional concepts from this perspective, and then probes into the relationship between their movement performance and the two. On the other hand, combined with the current research status of music theory in China, this paper also discusses the enthusiasm and limitations of Kurth's interpretation of linear melody and rhythm rhythm from the "kinetic energy theory" in this book.

2. Melody from the Perspective of Kinetic Energy Theory

As the primary element of musical expression, the primacy of melody has been fully reflected in eastern music, especially in Chinese folk music. Scholars all over the world have long studied melody in the fields of music creation, performance and analysis. However, the definition of "melody" has not been unified for a long time. Melody, which has been well known and studied, is generally defined as a collection of various musical elements (including at least "tones" and "rhythm"), whether it is in the New Grove Dictionary of Music and Musicians, the Concise Oxford Dictionary of Music, the Britannica, or in the Dictionary of Modern Chinese, The Encyclopedia of China · Music and Dance. The word "melody" is defined as the logical and organized movement of musical sounds in a certain rhythm at a certain pitch in Miu Tianrui's Encyclopedic Dictionary of Music and Wang Min and Zhou Yubei's Manual of Words in Multiple Musical Cultures. In some books, "rhythm" is even pushed to the first place of all elements in the melody. Some also added the volume, timbre and other factors to supplement. The object of Kurth's study in "Fundamentals of Linear Counterpoint" was first identified by name as "Linear melody", but this concept alone, combined with the previous definition of "melody", seems to be a "compound" musical element. However, the "linear melody" studied by Kurth more often refers to a "pure melody", that is, "a series of organized and successive individual musical notes constitute a pitch sequence". In terms of multiple elements of musical performance, the "melody" at this time only has a pitch meaning. This coincides with the earliest Chinese interpretation of the word "melody", which was first included in a domestic dictionary.

Compared with the comprehensive analysis of pitch, rhythm and even other elements of "melody" that many scholars routinely make, In Die melodische Energie, part one of the first chapter of Basis of Linear Counterpoint, Kurth studied the "pure melody" mentioned above from the perspectives of "pitch movement", "energy" and "perception" in a huge length, and went deep into its essence. It also pushed the independence, primacy and importance of melody to a certain height in the background of The Times that was dominated by harmony at that time. Kurth's definition of "melody" — "Melodie ist Bewegung" (melody is motion) — begins at the beginning of the body of Grundrissen des linearen Kontrapunkts, and his definition excludes the concept of "pitch" as well. More than once in his later treatises, Kurth emphasizes that melody is the result of motion, and that the phenomenon of pitch is merely an externalized physical manifestation. In his opinion, the traditional melody research is mostly based on the sound effect of the physical level, combined with the geometric presentation of the spectral plane to achieve the purpose of research, and the most basic and important content of melody research should not only stay in the sound effect, but also the sensory connection of an energy process between sounds and sounds. He posits that individuals' intuitive characterization of "melody" draws upon psychological and geometric terminology and frameworks—whether it be "flow," "gait," or the frequently mentioned concepts of "development" and others—all encompassing the notion of movement associated with the linear progression of melody. However, people have overlooked the essence of melody beyond these intermediary connections in their descriptive process. In addition, people use "melodic lines" to describe melodies with changes in "lines", which is the result of trying to sense the higher-level movement of sound from space. Taking these views into account, although the close relationship between melody and movement is not directly named, they all illustrate the essence of melody movement. Combined with the above description and explanation of the linear movement of melody, Kurth concluded that melody is built on the energy of movement, which establishes connections between various notes (or can be understood as "pitch points"), forming complex combinations, and finally forming a linear whole, namely melody.

After redefining "melody" from the perspective of "kinetic energy theory", Kurth makes a detailed discussion on the production and development process of melody, the movement form of melody, and the relationship between harmonic organization and linear movement in a multi-sound background.

2.1 The Production and Development of Melody

As for the origin and origin of "melody", the traditional interpretation has not made a clear explanation. From the previous definition of melody, its origin can indeed be seen as one musical sound after another, as if there is a melody as long as there is a musical sound or rhythm, and even some scholars have directly shown that in each case from the moment of sound, melody will emerge. Kurth explicitly opposed the above view in the Grundrissen des linearen Kontrapunkts. In his view, even to identify the origin of melody as music is a description that is floating on the surface of phenomena. To

study the production and development process of melody, one must go deep into the movement and change of mental energy under the surface of pitch.

In the first chapter, Kurth used more than ten sections to discuss in detail the process of the production and movement of "melody" under the impetus and participation of kinetic energy: First of all, Kurth attributed the origin of melody production to a mental movement, rather than the first expression of musical sound perceived by people in the physical level. He believes that this kind of mental movement is triggered by the impulse inside the human spirit, and the spiritual energy that triggers this impulse is called "Urwillen" (original will) by Kurth. In later discussions of the book, Urwillen is also referred to as the initial kinetic energy of the melodic process. So far, in addition to the definition of "melody", the definition of "kinetic energy" has also been clarified, namely, "motion energy", which exists in the human spirit and is a kind of spiritual energy. Its production and change trigger the production of melody and promote the change and development.

Kurth also discussed the process of melody from the generation of deep spirit to the perception of representation form in more words. However, the research on this process involves psychology and physics. For both of them, the proposal and demonstration of theories cannot be separated from the support of experimental cases and data, which is a shortcoming of Kurth's theory. Kurth studied the elements of music from the perspective of "perception" and "movement", but the lack of cases and data has also become one of the reasons for many scholars to oppose and doubt his theory. Therefore, Kurth's descriptive theory of the stages of melody is somewhat complicated and weak — in his discussion (as shown in Figure 1), the development process of melody is roughly divided into internal and external stages (which can also be described as deep stage and surface stage): The inner mental stage, in which the stimulation of the "original will" causes the melody to come into being, is merely the movement of energy that is stimulated within the mind. Before reaching the outer surface stage, the stimuli produced by the kinetic energy in the inner spirit begin to move outward continuously, and finally find their outward forms in the outer layers, and really reach the point where we used to say that we heard and felt. The physical sound has already completed the intermediate process of "melody concretization" as a "participating substance" in the process of melody "production and development". The final stage of the development process is the arrival of the stage of "perceptible expression". In short, what we perceive as melodies and even complete musical compositions is really the result of a series of psychological events occurring deep within the vast unconscious realm of our mental life.

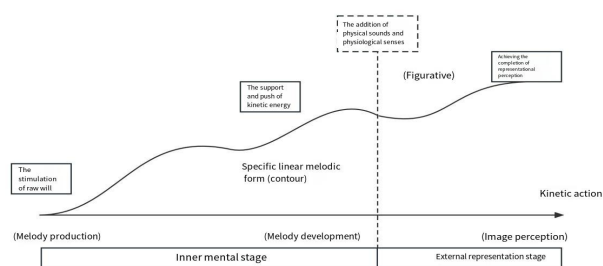


Figure 1: The production and process of linear melody

With his viewpoint on the origin of "melody" from the perspective of "kinetic energy theory", Kurth opposes our traditional cognition on the origin of "melody" — the physical phenomena related to "sound" and the physiological phenomena that produce "melody sense" after sensory perception cannot be considered as the origin of music, nor can they be considered as the basis of music. However, it is worth mentioning that while exploring the real origin of "melody", Kurth did not completely deny the above-mentioned physical and psychological double-layered functions. Kurth believed that they only provided the "material basis" for the content or way that the physiological senses could perceive, but from the perspective of the process, they were not the real deep beginning of "melody". "Original will" is the beginning of all the conscious and unconscious processing of music by human beings.

2.2 The Movement Pattern of Melody

The second main point of Kurth's research on the basic theory of "linear melody" in the first chapter of *Grundrissen des linearen Kontrapunkts* is reflected in the movement form of linear melody. The "melody" studied from this point of view has completed the process from internal spirit to surface perception, and has even been presented in music through visualization and geometry. Coulter's research on melodic motion patterns can be summarized in two aspects: the continuity of melodic lines and the "Developmental motives" as dynamic stages.

The question of melodic line continuity is to investigate whether the melody described by the title "line" is "really continuous", which is actually to study the essence and basic shape of the "melody line". In the playing and teaching of piano and other attenuating instruments, we often talk about the "line sense" of the melody. From the perspective of physical sound and physiological hearing alone, the two tones in succession appear as two pronunciation points. Although there will be a short overtone to lengthen it in time dimension, it cannot be denied that the melody line can be seen under such a background. It becomes an arrangement of pronunciation points with pitch meaning. From a geometric point of view, it is more like the arrangement of several points, rather than a coherent line. This phenomenon is more hidden in non-attenuating instruments because of the extensibility of the real tone, but from a physical and physiological point of view, the connection between the front and back articulation points is still broken. Coulter rejects this view from a "kinetic energy" perspective (as shown in Figure 2). By equating melody directly with "flowing energy", he proposes that the melodic line is indeed a continuous whole. He shows that the reason people think of melodic lines as a combination of individual pitchsense articulatory points and view them as "disconnected" is still limited to looking at melodic lines from the surface of the sound. To ignore the ongoing flow of mental energy that is always at work beneath the surface. Again, he argues that the kinetic energy that drives the perceived "pitch point" movement in appearances is what keeps a melodic line from acting as a discontinuum of "break points" in series. Kurth mentions that there is a "glissandized" gradation between two consecutive notes, which is actually a function of energy, which would make the melody appear to jump and break if it were built only on the perceived appearance of

sound.

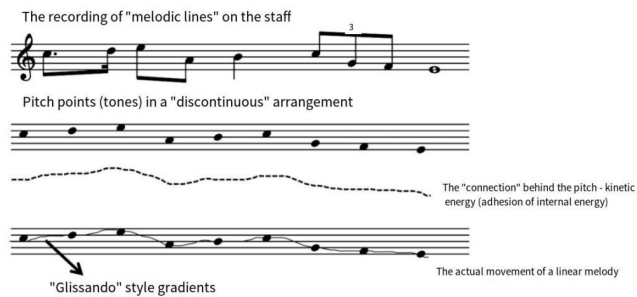


Figure 2: Contrast a "break" in the pitch of a melody with a continuous "melodic line"

On the other hand, having known that the melodic line is a continuous whole supported by kinetic energy, we can focus on the parts of this complete process -- for Kurth, the smallest stages of linear melodic motion that can be divided are Motives, as a relatively complete unit of character, and as one of the stages of linear motion. To enter into the inner spirit of men and govern the processing and development of a musical work or part of a musical work. As far as the linear stages of a complete musical theme are concerned, it may consist of only one stage of movement (i.e., one motive), or it may consist of several stages of movement (i.e., multiple motives). These small units, the melodic motifs outlined by the lines of pitch, are repeated in the transitional statements of Bach's musical compositions. Because of their obscure melodic characteristics and high flexibility, Kurth calls them "developmental motifs", and they are used repeatedly in his subsequent analysis of Bach's polyphonic music in the Basis of Linear Counterpoint. Through the above analysis of the stage motion in the ascending (Ansteigend), descending (Absteigend), and vibrational (Schwebend) states, Kurth strongly refutes the common theoretical understanding that melody is made up of a series or sum of tones; If the general, all tonal phenomena cannot be regarded as the secondary structure of the melodic whole, the original motive must be destroyed as they completely change and collapse.

Combining the above two main points of view, Kurth fully explained the movement stages and manifestations of linear melody, from the analysis of continuous "melodic line" movement from the perspective of the whole, to the analysis of each movement stage locally (even refined to the smallest unit "motive"). As the result of the action of kinetic energy, the perception of melody after being materialized by physical sound and physiological sensory intervention has a consistent description, which also reflects the logicity and systematization of Kurth's "kinetic energy theory" to a certain extent.

2.3 The Relationship between Harmonic Organization and Linear Motion

After fully discussing the origin, development and external presentation of "melody", Kurth begins to discuss the problem of multiple sounds caused by the longitudinal movement of multiple lines in individual chapters of the first part of the book. Although the main analysis is Bach's works, under this problem, the style problems of Baroque and classicism can not be avoided. In Section 7 of Chapter 1, Kurth showed that the concept of melody had been greatly weakened by the

theory of harmony at that time, and people could only see harmony and ignore the movement of linear melody when analyzing and studying multi-tone music. In Kurth's opinion, there are two main points that need to be refuted in the theoretical understanding of "melody" at that time. First, in Kurth's theory, melody is not only a collection of several pitches, but the original context of sound production, that is, the specific content of one musical note after another under discussion is in the context of linear melody. And the movement between notes merely represents the dynamic development of this line. Studies of the classical period and its aftermath, dominated by the tonic style, ascribe the inner power of melody more to the push of rhythm (and do not even delve into the energy of rhythm), thus greatly reducing the independence of melody.

Moreover, the second objection is actually a discussion of the priority of "harmony" or "melody" in the traditional understanding, that is, "horizontal" or "vertical". Many researchers at the time believed that melody was only secondary to an underlying harmonic basis, and the result of Kurth's argument was that melodic sensation could not even exist until the individual notes were understood as appendices to the harmonic meaning, which is clearly untenable. Under this view, although people classify Bach's polyphony music as free polyphony, they still insist that the writing of his polyphony melody is controlled by harmony, and the backbone of the melody is formed by the harmonic master. This is the "vertical horizontal" view mentioned above. Kurth still understood the production and processing of melody from the energy and perception level inside the representation, and his view was exactly the opposite. He believed that the "melody" in Bach's polyphonic music was its essential feature. The vertical combination of multiple lines in Bach's polyphony is essentially a "contrapuntal sentence pattern", and the composition of music is actually a process of "horizontal and vertical". The melodies in his works all have independent meanings. Compared with the vertical harmonic structure, the independent linear movement of each melody is the core of the development and design of Bach's polyphony.

To sum up, in Kurth's view, the development of music begins with melody, and the source of melody is kinetic energy. With the continuous development of vertical and horizontal, multi-voice music and even whole musical works appear. At the end of the first chapter of The Basis of Linear Counterpoint, Kurth showed that people's usual description of melodic imagery could not clarify the nature of its psychological process. Those composing techniques and appreciation methods that have been studied for a long time seem to be constantly exploring the processing of sound based on physical phenomena, but these are descriptions of imagery. The processing of music is actually the processing of the spiritual energy in the process of this movement.

3. Kinetic Energy and Rhythm

In the first chapter, the fourth chapter and the fourth chapter of the third part of the book Grundrissen des linearen Kontrapunkts, Kurth focuses on the Rhythm under his "kinetic energy theory", most of which is around the "rhythm". In the New Grove Dictionary of Music and Musicians, the definitions of "rhythm" and "Tempo" are closely related to

"time" — "rhythm" is first recognized as a movement, which is "marked by an orderly succession of strong and weak elements" and is a pattern of musical duration; "Tempo", on the other hand, is defined as the temporal performance of a musical work, including speed and rhythm within a given time, involving the determination of the duration of different rhythmic units. Among all the literatures specializing in the study of music rhythm, Zhang Wei's *The Form and Function of the Structure of Music Rhythm: A Study on Some Problems of the Force and Power of Rhythm Structure* generally divides the definition of rhythm into two kinds: "under the dynamic rhythm view" and "under the static rhythm view". Under the former perspective, rhythm is in a dynamic state and cannot be quantified and abstracting. In this view, the interpretation of rhythm is more subjective and difficult to describe. On the other hand, rhythm in the static view is closely related to rhythm, which is the most basic organizational form of rhythm, and rhythm can be accurately described in this view. Taking into account the definitions of "rhythm" and "beat" in the above literature, Kurth's definition of "rhythm" is more inclined to the definition of "dynamic rhythm" in Zhang Wei's article. In "Basis of Linear Counterpoint", he bypasses the traditional understanding of the long-term and unchanged description of "time" scale such as "duration" and "cycle". Instead, like "melody", he interprets it from the perspectives of "movement", "energy" and "perception". Compared with the previous definition of "melody", Kurth's discussion on rhythm and beat is shorter and more scattered. In addition to the discussion on the definition and basic expression of rhythm and beat (especially the former), other theories on rhythm and beat are mostly summarized in the comparison with melody and its kinetic energy. The following will discuss the rhythm rhythm under Kurth's "kinetic energy theory" from three aspects: the definition and generation of rhythm, the emphasis and pause in rhythm, and the relationship between melodic kinetic energy and rhythmic energy.

First of all, Kurth in chapter 4, "Kinetic Energy and Rhythm (*Bewegungsenergie und Rhythmus*)" begins with an objection to the traditional definition of "rhythm" and clarifies what he thinks "rhythm" — the "rhythm" that people usually study and describe, like "melody", is also the material representation of the process of mental energy movement after the embodiment of physical sound and physiological organs. If it is studied under the premise of monophonic part, The rhythmic relationship itself can only be described as the energy expression of the deeper mental impulses formed within the human spirit. Just as melody is a primitive context, rhythm is not the sequence of a series of articulation points, but a movement, so that the movement in the context of "melody" in the flow of each tone in the pitch of the specific emergence of different tension processes. In a word, the essence, origin and determining factors of rhythm belong to the content of movement and are the result of energy push — movement is the deepest origin. In contrast, the time-scale relationship and the arrangement of stress in the traditional definition are the appearance after people's physiological perception, which is secondary and superficial. However, Kurth's definition of "rhythm" does not stop there, otherwise "melody", which also comes from mental energy, would seem to be indistinct from it. In the second section of this chapter, Kurth clarified the difference between the two. The source of melody and the

support for its development are indeed kinetic energy, whose essence is the result of the action of kinetic energy, while rhythm is a specific movement phenomenon in the musical context of melody. In other words, it is the specific expression form of kinetic energy supporting the development of melody at a specific stage. To sum up, from the perspective of his "kinetic energy theory", Kurth defined "rhythm" as the result of the action of mental energy, and emphasized its "shaping" effect on "melody line". Precisely because of this effect, melody has more special features, such as the regular stress cycle perceived by people, actually depends on the tension of mental energy during the melody process.

Secondly, Kurth specifically analyzed the two motion states of "stress" and "pause" when he explored the movement performance of rhythm. On the problem of "stress", Hugo Riemann divided "stress" into three categories: beginning, middle and end in *Musikalische Dynamik und Agogik* (1884). In the *Form and Function of Rhythmic Structure of Music*, Zhang Wei argued that the understanding of "stress" in traditional rhythm theory was either limited to the discussion of "rhythmic stress" or limited to the discussion of the change of the intensity of musical events. In the book, he emphasized the diversity of stress forms in musical practice and thus classified stress. However, in contrast, in addition to the fact that the "melodic stress" in his theory is similar to Kurth in the presentation, Kurth still attributes this series of "stress" phenomena to "external dynamic stress". From the discussion, he once again emphasizes the difference between the movement of internal energy and the surface phenomenon. He emphasizes melody as the context of music. The supporting role of its original kinetic energy — he defined the "stress" under the definition of traditional rhythm as a kind of embodiment of the sense of movement in rhythm, and used the two image words "weight" and "heavy" to describe it. He distinguishes his definition of "stress" from the dynamic intensification of melodic imagery, and rhythmic stress can be said to be a "sense of emphasis", the accumulation of mental energy and the expression of a certain amount. In the past, a great deal of music creation and theoretical practice equated this "convergence point" of mental energy with the dynamic intensification of musical image, and in practice, the treatment of "stress" mentioned here is not only a practice of giving more dynamic intensity to the notes in the melody. The two are not synchronized concepts in Kurth's discussion. Sometimes the stress of the rhythm is not an enhancement of the external expression, but an internal enhancement in the melodic context.

Kurth also analyzed Bach's rhythm when he studied his melodic lines in the third chapter of the *Basis of Linear Counterpoint*. In the third section "Die Dynamik der Pausen", he interpreted "pause", another situation of rhythmic movement, from the perspective of "kinetic energy theory". He believes that "pause" is characterized by a specific tension, because the energy permeating the melodic context does not suddenly disappear with the last break formed by the tone melody (that is, the last pronunciation of the pronunciation point is completed), but produces a relatively empty feeling, which is still full of energy, this energy comes from the internal motivation of forming the pause. Kurth believes that "pause" should also be part of the rhythm, which is not inconsistent with the traditional view that the rest is

responsible for the formation of a specific rhythm. In his interpretation, the pause is still dynamic as a definite characteristic feeling — when entering the stage of pause, the melody's kinetic energy is transformed from the pronunciation of specific pitch before to silence. However, the melody does not end there, and the end of the melody sometimes occurs not when the last note stops, but when the energy in the melodic context completely fades and the tension is completely relaxed (as shown in Figure 3). It is worth noting that in this section Kurth contrasts his view of pauses with Hugo Riemann's view of pauses as "the negative equivalent of tone". In Kurth's view, music is born of energy, and in the final analysis, there is only the difference between presence and absence. Riemann's definition of vocal musical fragments as positive, and the definition of pauses as negative, is a negative interpretation of pauses, and he does not see the mental energy that still plays a role in pauses. Moreover, in Kurth's view, there is no mental representation or event corresponding to a pause defined as a negative phase of dynamic force. At the end of this section, however, Kurth also emphasizes the value of Riemann's argument that a "pause" is not an empty nothingness, which does not mean that there is no musical content beneath it, and that even a pause is achieved through a certain musical event.

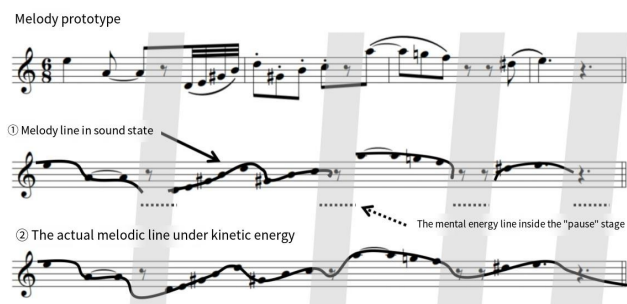


Figure 3: Analysis of melodic lines with "pauses" in Kurth's view

Finally, according to Kurth's definition of "melody" and "rhythm", the source of both seems to be kinetic energy, although there are some differences in the definition, but if the difference between the two is not clear, it may cause problems such as unclear concept in future studies. In the fifth section of the first chapter of *Grundrissen des linearen Kontrapunkts*, Kurth clearly distinguished the difference between the "kinetic energy" as the source of melody and the energy in the "rhythmic impulse". He emphasized that "kinetic energy" is the "adhesive" and "driving force" connecting the melody and the flow of all sounds in its context. Although rhythm can be traced to kinetic energy in the first place. But, as mentioned above, it is only the specific form of expression of kinetic energy in a specific stage. In the third part, Kurth supplemented the relationship between the two. He believed that rhythm is indeed the result of kinetic energy, which has a certain constraint, limitation and even "shaping" effect on the development of melody, and it gives linear melody more specific and rich details. The melody that people finally perceive can be seen as the result of the development of kinetic energy between tones and the energy stimulation of rhythm. Kurth analyzed the subtle relationship between Bach's fugue theme and Beethoven's piano sonata fragments by taking them as examples. In a certain stage of melody, when the limiting effect of rhythm is in the upper hand, the original kinetic action of melody is restricted or covered up in

the context of tone, and the development of this stage gives priority to the boost of rhythm energy to a large extent. Such musical fragments are well represented in most of the works of the classical period; On the contrary, the representative impromptu melodies in Baroque music and the colorful sentences deeply influenced by them in later works fully reflect the limiting force that the rhythm energy has formed due to the equalization or even liberalization of rhythm. At this time, the development of melody is mainly reflected in the action of the kinetic energy running through itself and the tones, as shown in Figure 4.

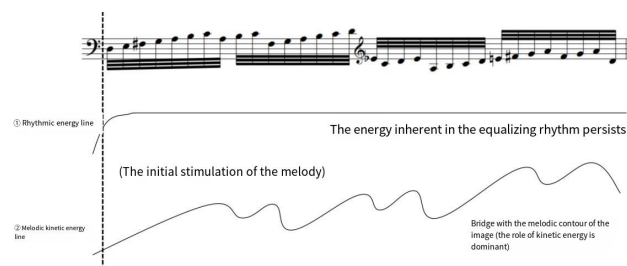


Figure 4: Analysis of the linear states of kinetic energy and rhythmic energy in melody (from Bach's Semitone Fantasia)

To sum up, Kurth's interpretation of "rhythm" as an element of music from the perspective of "kinetic energy theory" is not only a supplement and extension to the relevant theories put forward by predecessors such as Hugo Riemann and earlier scholars, but also provides a new perspective and thinking for later scholars who study "rhythm". We often use "gait", "pulse", "rhythm" and other words to visualize the description of rhythm, in Kurth's opinion, this is the vivid expression of the energy state. The generation, change and development of rhythm were explained from the perspective of movement and energy, which transformed the static frame of "long and short combination with accent" in the traditional cognition into a tension state in constant motion in the melodic context, which also laid the foundation for Kurth's later study on the development of harmony and musical form structure from the perspective of "kinetic energy theory".

4. Evaluation and Enlightenment

Compared with Kurth's later works, the "kinetic energy theory" interpretation of "linear Counterpoint", "melody" and "rhythm" in *Grundrissen des linearen Kontrapunkts* introduces many unfamiliar concepts for the first time, and lacks analysis charts and musical examples with data and images, so that readers are often confused by long texts in the process of reading, and thus "reject" his theory at the perceptual level. Furthermore, it ignores its theoretical value. The length of Kurth's "Kinetic energy Theory" covers three great works, and the theories of "melody" and "rhythm" selected in this paper only account for a very small part of them in terms of source and expression, which is like the process of constructing a complete picture. After clarifying the "line" element theory from the perspective of "kinetic energy theory", the vertical superposition of voice parts and the structural movement of a larger length are adopted. Kurth also used this theory to analyze the harmonic movement and the development of musical forms. Kurth's exposition of "melody" and "rhythm" from the perspective of "Kinetic energy theory" in the book *Foundation of Linear Counterpoint* has deeply explored the sources of perception

and movement within their appearances. In the book, he gives examples and analyzes a large number of musical examples led by Bach's polyphonic works, and constantly analyzes the style of works while discussing the theory of linear techniques. It can be seen that the author adheres to the goals of "polyphonic teaching" and "mastering style" in the preface of the book, and also reflects his emphasis on applying technical theory to music analysis practice.

However, "motion energy" and "psychological perception" as the core of the study of "kinetic energy theory" have drawn the theory from a simple music theory to the direction of physics and psychology. The first half of the 20th century, when Kurth lived, was a period of establishment and initial development of various new disciplines, and kinetic energy theory also became the cross product of composition-technical theory combined with psychology and physics. However, when the subject research failed to achieve quantification and the relevant experimental conditions could not be met, Kurth lacked necessary empirical research and experimental data when he expounded his kinetic energy theory, which was also one of the reasons criticized by many scholars in the same period and later, and they even summed up Kurth's huge theoretical exposition as a "bland and slightly verbose narrative". Although there were some immaturity and limitations in the theory proposed by Kurth when the theory was established, one of the great values of Kurth's "kinetic energy theory" was that it provided the research direction and precedent for the later development of the theory. By the second half of the 20th century, the subdivision and quantification of the discipline promoted another development peak of "kinetic energy theory". During this period, "Kinetic energy theory" began to develop in three directions: quantification and systematization, application of music analysis and application of aesthetics. This branch of in-depth research toward quantification and systematization carried out quantification, image and concrete analysis and demonstration of Kurth's theory to a large extent (although it was not necessarily aimed at this directly).

After repeatedly reviewing Kurth's relevant materials and Grundrissen des linearen Kontrapunkts, the author not only had an initial impression of "Kinetic energy theory", but also obtained several new ideas and new inspirations for music research, which may be beneficial to our current music theory research:

First, pay attention to the process and movement of music. Starting from "kinetic energy theory", Kurth studies and analyzes the elements of melody, rhythm, harmony and musical form in music from a dynamic perspective. The motion state of each musical element in the course of events constitutes the change and development, characteristics and personality of musical works. In contrast, the traditional compositional technical theory puts forward a large number of "static" concepts, such as "rhythm type" and "musical form" as "framework". Although this is the inevitable result of studying the commonness and individuality of musical works in a certain period and region, it is obviously not advisable to analyze and create music from the summarized "formula". Especially in the era of different styles of music creation since the 20th century, the research significance of "dynamic process" is more theoretical and practical value compared

with "formula", and the analytical theory derived from it needs to be constructed urgently.

Second, the focus of the research is more on "people" and the perceptual experience of music. In recent years, more and more scholars have called for the importance of "human" as the subject of music theory, especially in music education, music aesthetics and other disciplines. As the subject of music creation, performance, listening, appreciation and criticism, "human" has its status and function reflected in every link of music practice. One of the cores of "kinetic energy theory" proposed by Kurth is "human perception". He identified the source of each musical element as the inner spiritual energy of the human being, and from this, he analyzed the works based on the promotion and change of energy. However, his theory still belongs to the theory of composition technology to a certain extent. This also shows the prominence of the subject of "human" in the branch of composition technology theory, and the status of people's perceptual experience in music practice should also be emphasized and promoted.

5. Conclusion

In terms of the theoretical development of "kinetic energy theory" itself, Kurth's theory has made great contributions to the construction of the school and theoretical system, and directly influenced a large number of scholars who promoted the development of "kinetic energy theory" in the same period and later. Based on the author's research on Kurth's Grundrissen des linearen Kontrapunkts, this paper combs Coulter's theory of "melody" and "rhythm" from the perspective of "kinetic energy theory" from the theoretical logic, and compares Kurth's viewpoint with the traditional analysis theory and the viewpoints in some important current literature. Although there are some shortcomings in the process of theoretical elaboration, Kurth's enthusiasm and advanced nature in interpreting these musical elements with "kinetic energy theory" is beyond doubt — he attributes music to the result of psychological energy and emphasizes the original role of human perception in music. It still shows great enthusiasm and vitality in the 20th century and even today when the discipline is flourishing, and the research on this theory still has broad prospects.

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