



Analysis of the Musical and Artistic Value of the Clarinet in the Qing Dynasty and Its Influence on the Creation of Modern National Musical Instruments

Sheng Chen ^{1*}

¹ Lecturer, School of Music, Minzu University of China, Beijing, China

* **Corresponding Author:** 202201029@muc.edu.cn

Citation: Chen, S. (2024). Analysis of the Musical and Artistic Value of the Clarinet in the Qing Dynasty and Its Influence on the Creation of Modern National Musical Instruments. *Mediterranean Archaeology and Archaeometry*, 24(3), 134–147. [10.5281/zenodo.13690667](https://doi.org/10.5281/zenodo.13690667)

ARTICLE INFO

Received: 22 Feb 2024

Accepted: 13 Jun 2024

ABSTRACT

The Qing Dynasty was a critical period for the development of Chinese and Western musical instruments, which had an important impact on the creation of Chinese national musical instruments. In order to dig deeper into the archaeological value of Qing Dynasty musical instruments, this paper takes clarinet instruments as the research object, and analyzes the musical instruments with the help of an electron microscope and min microphone, and the test indicators include instrument structure, material, resonance point, and sound effect. The results show that the clarinet has the characteristics of flute and suona, the vocal range is mainly treble, the material is mainly ebony and mahogany, copper and iron are the auxiliaries, the resonance point is at 2/3 of the music, and the structure is relatively simple compared with the modern clarinet, which is composed of the mouthpiece, the main pipe and the bell mouth. Therefore, the clarinet is an important instrument for the orchestra to play the middle and high parts, which promotes the development of modern music ensemble performance in the direction of high notes.

Keywords: Qing Dynasty Clarinet, National Musical Instruments, Western Musical Instruments, Musical and Artistic Values.

INTRODUCTION

The clarinet is a Western instrument that entered China during the Qianlong period (1736~1796 AD) and became a Western instrument often used in court events, folk celebrations and other occasions, enriching the playing parts of Qing bands. During the Cixi period (1835~1908 AD), the clarinet appeared frequently in the lives of literati and scholars, and gradually won their favor. In the eyes of court musicians and some literati, the clarinet is undoubtedly a very exotic, amorous and interesting instrument (Almeida, Li, Schubert, Smith, & Wolfe, 2023; Chernaya & Zhao, 2019; Gao & Li, 2024; Hope & Robinson, 2017), with the characteristics of keyboard instruments and orchestral instruments, and the vocal frequency is high. In the Qianlong period (1736~1796 AD), the clarinet was used in some banquets and celebrations in the Qing Dynasty, mainly used to play ancient Chinese music, show the characteristic timbre of the clarinet, and have a very obvious artistic expression. During the Jiajing period (1522~1566 AD), the clarinet played an important role, leading the melody, enhancing the timbre layer, and enriching the expression of the music. The melodious and feminine timbre of the clarinet is more often used in some melodic music. In the late Jiajing period (1544~1566 AD), the clarinet had a very unique and strong expressiveness, adaptability, and applied the clarinet to the performance of different styles of works, and could improve the overall effect of the music. It can be seen that the clarinet became a popular Western musical instrument in the court and literati circles during the Qing Dynasty (1616~1912 AD), and has been integrated into folk music performances and appeared in folk celebrations. Based on this, the form and style of folk music during the Qing Dynasty (1616~1912 AD) began to be further promoted, and influenced the exchange and integration

between Chinese and Western music. In the development of the music field of the Qing Dynasty, the clarinet had a variety of functions, which were manifested: first, the artistic expression of Qing Dynasty music was single, lacking orchestral music, mainly drums, gongs, bells and qins, and the use of flutes and Xiao was relatively more, but mainly low-frequency and deep music. The clarinet is a very distinctive, expressive and timbre-charming instrument, its main characteristics are high frequency and high register, which adds to the timbre level and emotional expression of Qing Dynasty music to a certain extent, and promotes Qing Dynasty musical instruments to the direction of high range. At the same time, the clarinet has a melodious and soft timbre, which is very suitable for some music performances with strong melodies, and it needs to be integrated with other instruments to make Qing Dynasty music performances more charming (Ito et al., 2017; Kiliç, 2023; Lanza, 2022). The melody is single because traditional Chinese music pays great attention to word cards and keys. The appearance of the clarinet leads the melody, adds a sense of timbre and layering to the music, leads the melody, and is enough to lead other instruments and parts to unfold the melody. Moreover, with the characteristic timbre and expressiveness of the clarinet, the player can better show the delicacy of the timbre level of the complete piece, so as to make the music more colorful. Although the structure of the Qing Dynasty clarinet is relatively simple, its performance characteristics are obvious. It has high musical and artistic value, a clear and bright timbre, and can show strong expressiveness. In addition, the Qing Dynasty clarinet required the player to control the breath, so the requirements for performance skills were high, promoting the development of modern music from cultural connotation to performance skills. To this end, this paper analyzes the musical and artistic value of the clarinet in the Qing Dynasty as a breakthrough point, and analyzes the influence of clarinet music on the creation of modern national musical instruments (Nikolaievska et al., 2022; Payne, 2018; Pusceddu et al., 2022). First of all, the clarinet music data and literature were collected for in-depth analysis, and the data were collected with the help of microscopes and min microphones. Secondly, the structure, construction, and vocal point of the clarinet are analyzed, as well as the characteristics of the music. Finally, the archaeological value of the clarinet and its influence on the creation of modern national musical instruments are analyzed to find out its enlightening value, as shown in Figure 1.

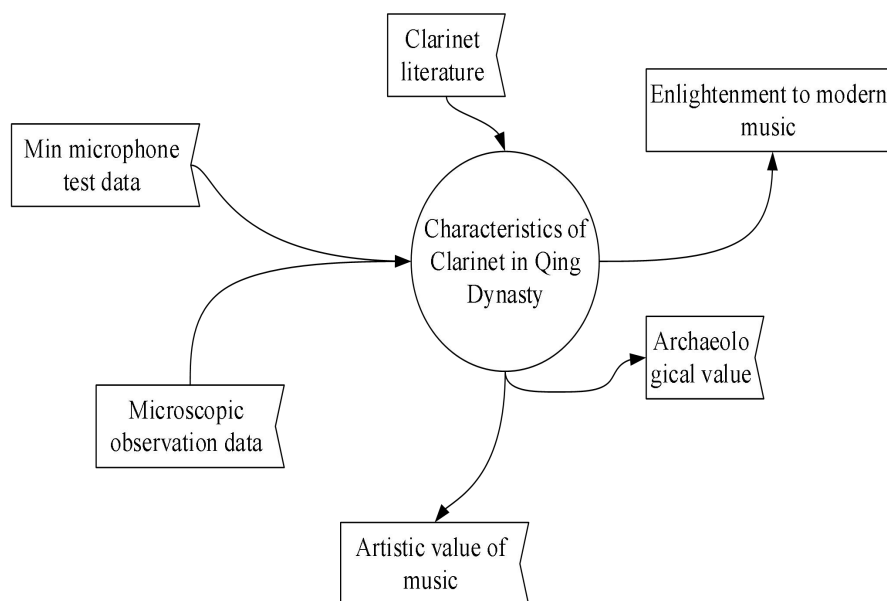


Figure 1. The Research Idea of this Paper

In short, the clarinet has high archaeological value in terms of emotional expression and emotional transmission, skill application, and cross-cultural integration, and has a profound impact on the creation of modern national musical instruments, especially in timbre shaping, breath control, and emotional expression. The Qing Dynasty clarinet gradually merged with national musical instruments, showing a personalized style and profound emotions, and enriching the content of national music culture.

METHODOLOGY

Taking the Qing Dynasty clarinet instrument as the research object, the instrument was analyzed with the help of an electron microscope and min microphone, and the test indicators included: instrument structure, material, resonance point, and sound effect. Among them, the structure of the instrument is mainly to compare

the differences between the Qing Dynasty clarinet and the modern clarinet, including structure, sound point, etc., the material is mainly a wood structure, metal structure, and the effect on the sound, the resonance point is mainly to test the position of the sound, and the resonance situation, and the sound effect includes loudness, frequency, etc. The relevant data and information are publicly available online and actual tests.

RESULTS

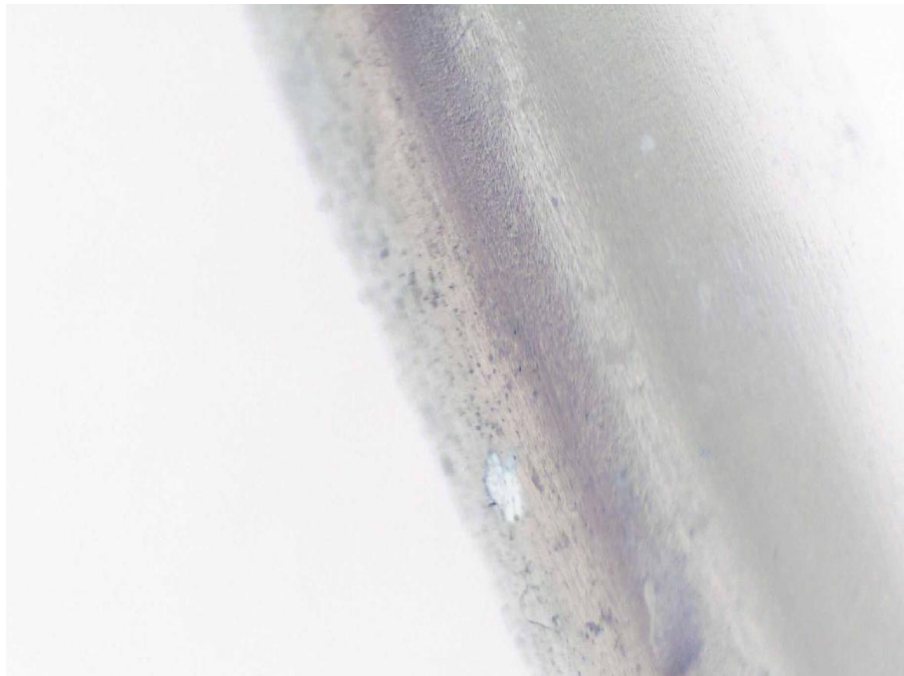
The Structure and Material of the Qing Dynasty Clarinet

During the Qianlong period (1736~1796 AD), the clarinet had a simple structure, mainly the mouthpiece, the main body and the horn, while the modern clarinet added the tone key, and the horn was also improved, the specific differences are shown in Table 1.

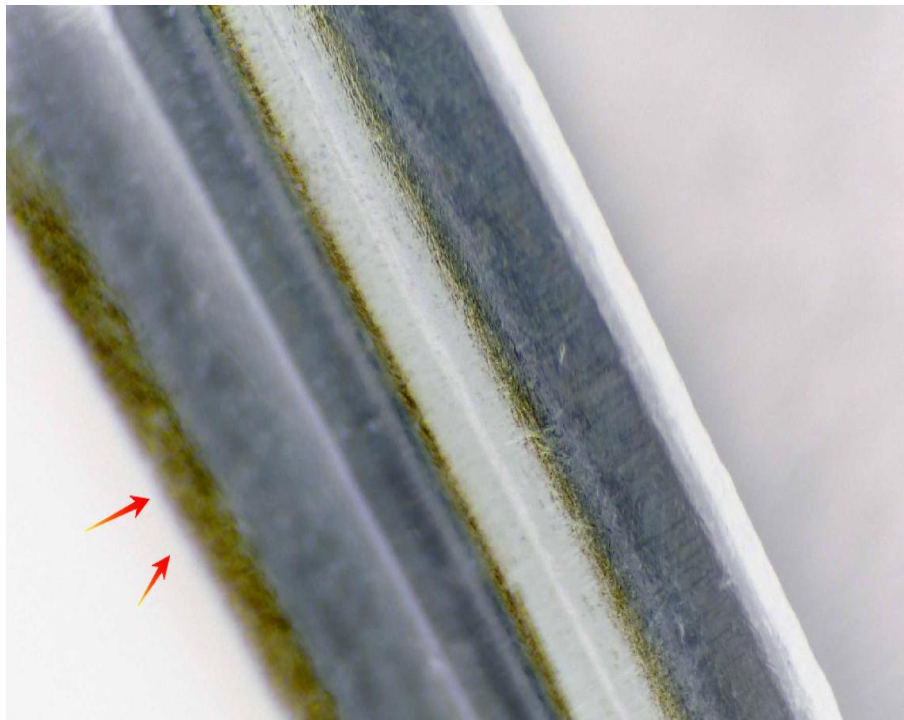
Table 1. Parameters of Clarinet

Period	Flute	Horn diameter	Length of main pipe	Material	Tonality
Qianlong period (1736~1796 AM)	24 cm	30	30	Ebony, bronze, iron	bB key
Jiajing period (1544~1566 AM)	22 cm	32	28	Mahogany, bronze, zinc	F and D tones
Cixi period (1835~1908 AM)	20 cm	34	26	Mahogany, bronze, iron, zinc	bE key

As can be seen from Table 1, the length of the mouthpiece gradually decreases, the diameter of the horn gradually increases, and the length of the main pipe gradually decreases. Although the above parameters vary irregularly, they can be analyzed from the perspective of the characteristics of the music. The reduction of the mouth and the length of the main tube will produce a high-frequency sound for the sound, while the increase in the diameter of the horn will increase the transmission distance of the sound and increase the loudness of the sound. The change of this indicator shows that the clarinet in the Qianlong period (1736~1796 AD) was dominated by bass, and in the Cixi period (1835~1908 AD), it developed into high tone.



Qianlong Period (1736 ~ 1796 AM)



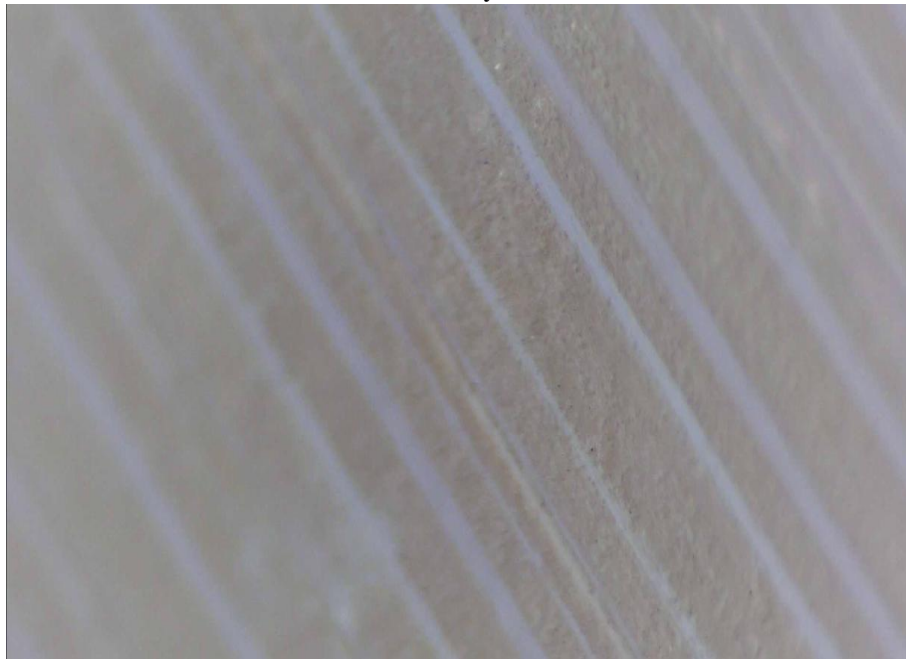
Cixi Period (1835~1908 AD)

Figure 2. Surface Plating of Clarinet Keys from Different Periods

As can be seen from the values in Figure 2, the surface coating of keys in the Cixi period (1835~1908 AD) was more complex, mainly containing zinc, iron and other elements, so the surface presented a more complex hue. Since the clarinet entered the Qing Dynasty, people have carried out in-depth exploration of the clarinet; therefore, under a certain development, the Qing Dynasty clarinet performance became a new form of entertainment at that time. Qing Dynasty clarinet performance has obvious characteristics, especially its timbre is very melodious and soft, always pays attention to the expression of inner emotions and emotions, can show the delicate and soft timbre of Qing Dynasty music, and pays attention to emotions leading the audience to resonate with them. The music played by the clarinet in the Qing Dynasty is generally ancient Chinese music, so its melody and melody is very moving, beautiful, and the delicacy hits people's hearts, rich in the charm of the combination of Chinese and Western cultures. In the performance of clarinet music in the Qing Dynasty, people generally borrowed from the performance style of Western musicians to make some different innovations, such as combining the performance skills and advantages of the clarinet, integrating their creativity and ideas, and using new techniques. For example, in the Qing Dynasty, clarinet musicians usually showed their clarinet skills through blowing and breath control. They tend to borrow from Western wind techniques, but they still incorporate their own personal expressions on top of this, so as to better express the charm of Qing Dynasty music. In addition, the performance of Qing clarinet players often integrates the characteristics of classical Chinese instruments, such as the guqin (Roh, Oh, Song, Han, & Lim, 2022; Sharma et al., 2023), flute and other musical instruments, which are often absorbed and innovated. Qing Dynasty performers often used this to show traditional Chinese music's unique melodies and delicacy. In addition, the main structure of the clarinet has also changed, gradually changing from ebony to mahogany, as shown in Figure 3.



Ebony



Annatto

Figure 3. Wooden Structure of a Clarinet

As can be seen from [Figure 3](#), ebony contains many fiber particles inside, so the resonance effect is better, while the texture of mahogany is relatively loose and the resonance effect is poor. However, the grain of mahogany is clearer, which can better conduct sound transmission and prolong the transmission distance of sound. The change from ebony to mahogany also shows that the scope of application of the clarinet has shifted from the court to the people. Compared with Western clarinetists, Qing clarinets paid more attention to emotional expression in the process of playing. For example, Qing Dynasty performers would use the requirements of the clarinet to show different timbre variations and use some classical Chinese music performance techniques to convey inner emotions. Qing clarinet players may have paid more attention to the emotional connotation of their music, and, therefore, were more experienced in some details. For example, Qing clarinets would show their classical skills through their mastery of each phrase, and they would also innovate in their expressive techniques and show their individuality through the details of breath control. For example, in breath control. During the performance, the Qing Dynasty clarinet players would adjust the depth and rhythm of their breathing to better control the

performance of the length of the notes and the change of timbre, and improve the sound effect of the blowing. For example, deep breathing is often used for long notes to enhance the expressiveness of the notes, while shallow breathing can express lighter and shorter notes, and better grasp the flow and dynamics of the breath, and at the same time, integrate the mood and emotion of the performance to make the music more moving. Moreover, in terms of fingering skills, Qing clarinet players have a very exquisite technical performance (Strosberg et al., 2017; Suurpää, 2023), they can use their fingers flexibly to achieve a precise grasp of various notes, and play accurately. By quickly and accurately changing the position of their fingers, Qing clarinet players were better able to complete some melodies with complex phrases and show virtuosity. In addition, in terms of timbre adjustment, Qing Dynasty clarinet players also have certain skills, for example, they often show a unique timbre through the adjustment of the oral cavity and blowing strength, so as to improve the performance effect. In this way, the clarinet can be played to a higher level, whether it is soft, warm, or bright and sharp timbre, it can be revealed, and the effect of the clarinet music can be enhanced.

Resonance Effect and Horn Structure

The resonance and horn diameter of the clarinet are tested, and the specific results are shown in Table 2.

Table 2. Comparison of Resonance Positions and Horn Structures in Different Periods

Resonance position	Qianlong period (1736~1796 AD) bell diameter			Cixi period (1835~1908 AD) bell diameter		
	30 cm	28 cm	26 cm	30 cm	28 cm	26 cm
1/10	0.718	1.550	-0.070	0.343	-0.085	-0.279
1/5	-0.881	-1.725	-0.479	0.656	-0.376	-0.255
1/3	0.194	-1.647	-0.250	0.607	-0.861	0.438
1/2	-0.036	1.013	-1.223	0.553	0.469	-1.245
3/4	4.215	3.599	4.154	2.074	1.614	3.880
2/3	1.778	2.016	0.636	3.634	3.851	4.266
5/6	1.136	4.274	3.833	2.458	1.776	0.971
2/5	1.721	3.028	2.755	3.860	3.787	3.294
3/5	2.026	3.235	3.024	0.636	2.286	1.120
Average contour factor: 0.161						

It can be seen from Table 2 that the horn structure of the Qianlong period (1736~1796 AD) had little influence on the resonance position, while the resonance position of the Cixi period (1835~1908 AD) had a significant correlation with the diameter of the horn, mainly because the horn in the Qianlong period (1736~1796 AD) was only decorative, and its purpose was still to focus on court music, with low frequency as the main keynote, and the bB key of middle and high tones. Relatively speaking, the clarinet in the late Qing Dynasty was deeply rooted in the people, so the resonance of the clarinet in the Cixi period (1835~1908 AD) changed, and the loudness is higher to prolong its vocal distance, so the resonance position is more forward.

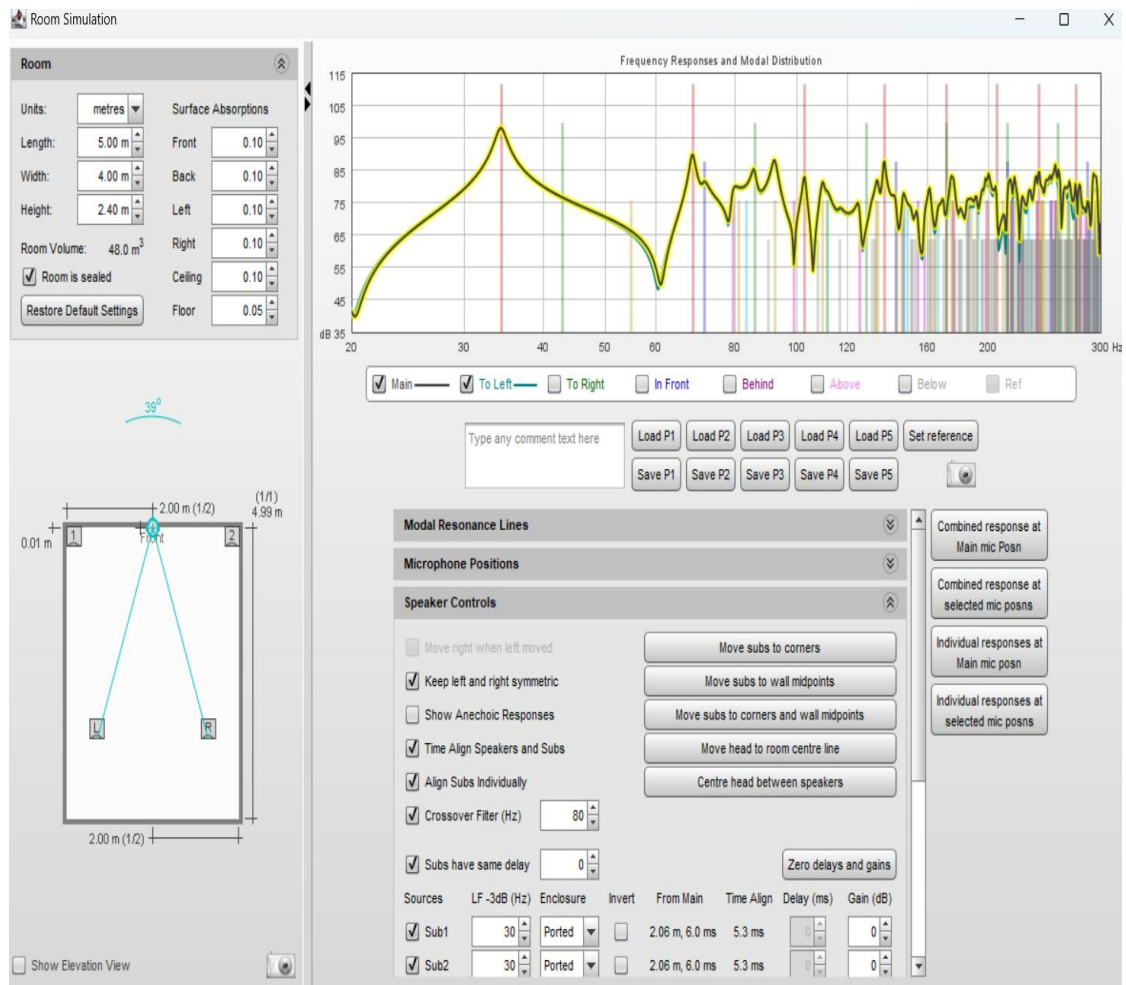


Figure 4. Simulation of the Loudness Transmission Distance of the Clarinet During the Cixi Period (1835~1908 AD)

By simulating the transmission distance of the clarinet during the Cixi period (1835~1908 AD) (Figure 4), it is found that its loudness resonance angle is 39° , and the best performance can be achieved in the range of 4.99 m. In the absence of audio testing tools, such a resonance angle was achieved, indicating that the clarinet was playing well at that time. Since the clarinet became popular in Qing Dynasty society, the music culture of the Qing Dynasty has been affected to a certain extent, which is manifested in the following aspects: first, the introduction of exotic customs. The clarinet is a famous Western musical instrument, and after entering the Qing Dynasty society, it became an exotic style in the music culture of the Qing Dynasty society, allowing some people at that time to realize the charm of exotic style music. At the same time, the unique timbre and expressiveness of the clarinet as a Western musical instrument also made many Qing literati and scholars realize that the different forms and contents of music performance can have different charms. After the clarinet entered the society of the Qing Dynasty in China, the musicians of the Qing Dynasty began to recognize the differences between Chinese and Western musical cultural expressions, and began to pay attention to the innovation of music creation, which broadened different possibilities for the development of Qing Dynasty music and gave many musicians new inspiration. Second, enrich the forms of musical expression. In Qing Dynasty music, the clarinet played a very important role, for example, it had a great influence on the improvement of the timbre level and expressiveness of many Qing Dynasty music (Velut, Vergez, Gilbert, & Djahanbani, 2017; Worthington, 2020). After the efforts of some musicians, the clarinet performance was very popular among the musicians of the Qing Dynasty, because the tone of the clarinet is melodious and moving, very soft, therefore, the Qing Dynasty musicians used it to play some music with rhythmic characteristics of the Qing Dynasty, so that the music of the Qing Dynasty has more forms of expression. In addition, the use of clarinet in some banquet celebrations at the time also expanded the coverage of clarinet music in the Qing Dynasty. In a sense, this also has a certain role in promoting the continuous development and growth of music and art in the Qing Dynasty.

Concentration of Sound During Performance

The sound distribution of the clarinet was tested with the force testing software and the clarinet sound effect

was verified, and the specific results are as follows (Figure 5).

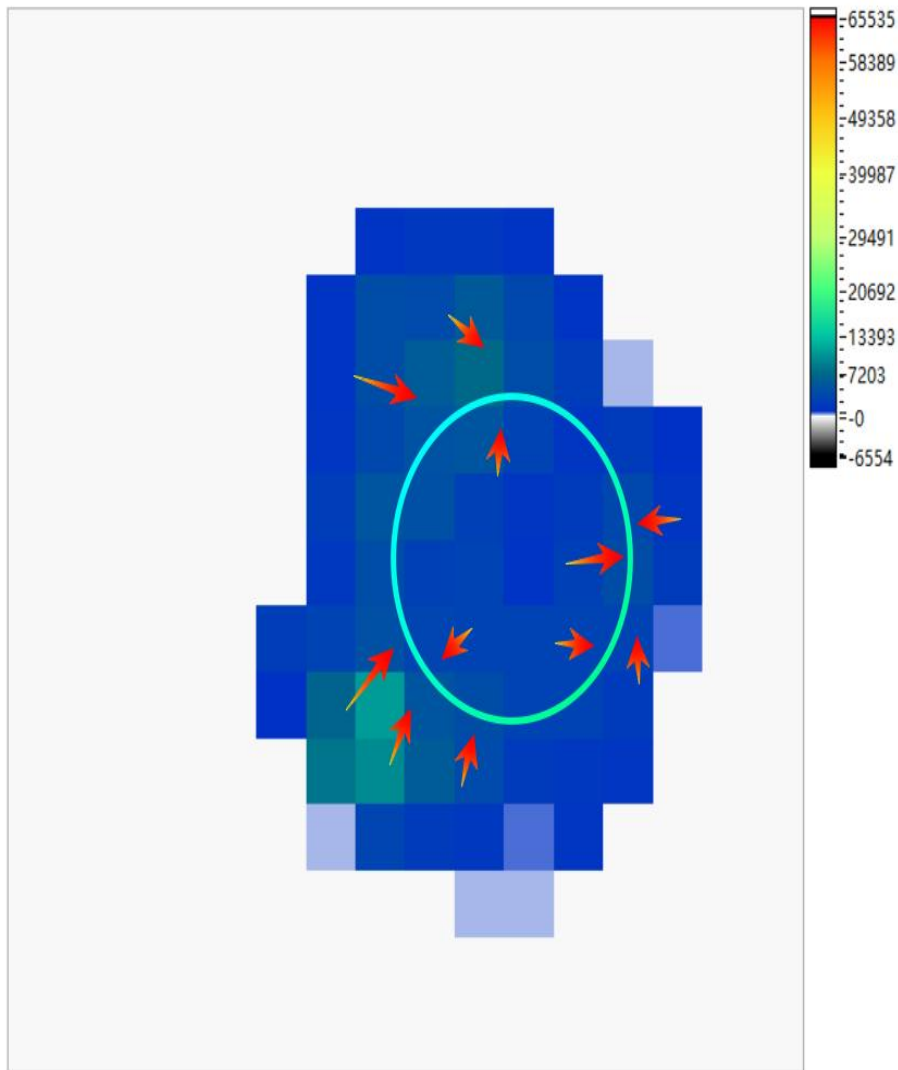


Figure 5. Clarinet Vocal Strength Test (unit: g)

From the clarinet strength test results, it can be seen that the occurrence is mainly concentrated on both sides of the horn, and the sound effect is better. This test shows that the vocal design of the clarinet is relatively concentrated. During the Cixi period (1835~1908 AD), the clarinet performance could show extraordinary timbre and expressiveness, so the horn shape of the clarinet had an important impact on its scope of application, which also indirectly illustrated the pursuit of multi-timbre expression in music at the end of the Qing Dynasty, and influenced the development of modern national musical instruments. The clarinet was tested and the results are shown in Figure 6.

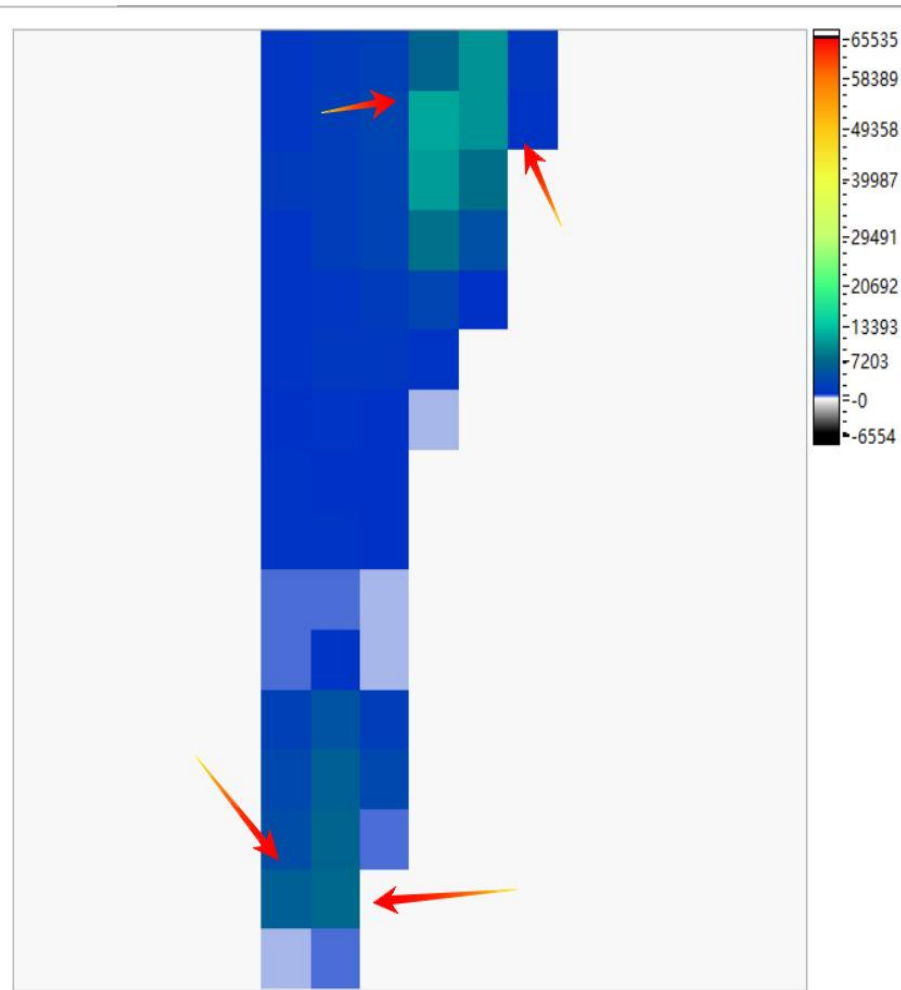


Figure 6. Clarinet Vocal Position and Sound Resonance Position Test

The upper part of Figure 6 shows the position of the clarinet and other instruments, and the lower part is the position of the clarinet sound. There are a large number of silent areas between the resonance position and the sound generating position, indicating that the design of the clarinet is reasonable, and there is a reasonable resonance between the various parts, so as to improve the overall effect of resonance. In modern folk bands, the clarinet has gradually become a combination element with traditional instruments such as the flute and erhu since the Qing Dynasty, and has had an impact on the layered musicality of modern music and the improvement of timbre effects. In other words, this kind of fusion has broadened the timbre and musical expression of modern folk music, and provided new inspiration for composers' creations. Based on this, it has a positive effect on the creation of modern Chinese folk musical instrument music and has certain artistic value.

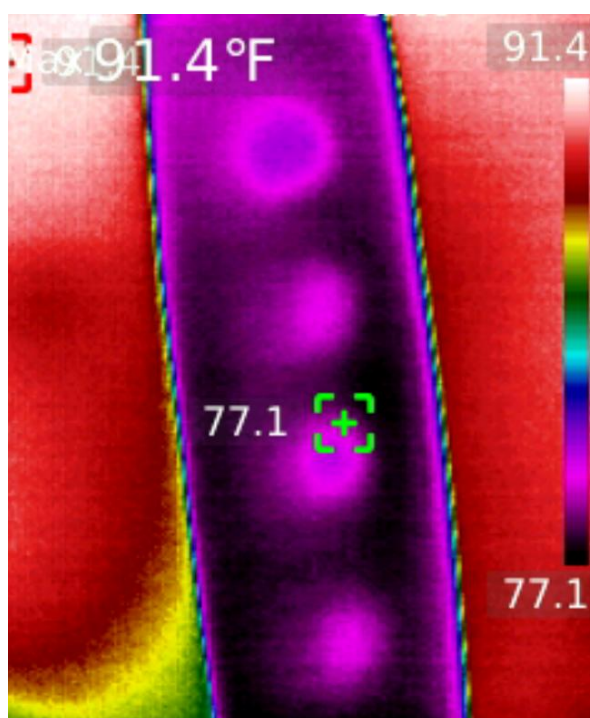


Figure 7. Temperature Test of Clarinet after Vocalization

From the test results in Figure 7, it can be seen that when the clarinet is vocalizing, the temperature of the main pipe hole is significantly higher than that of the main sound tube, indicating that the main sound tube resonates, and the sound energy loss is small, so the temperature does not rise. The above analysis proves that the clarinet in the Qing Dynasty was more reasonable in terms of sound, and also proves that the clarinet was more popular in the Qing Dynasty, which changed the performance form of music in the Qing Dynasty.

THE INFLUENCE OF THE CLARINET ON THE PERFORMANCE OF MODERN NATIONAL MUSICAL INSTRUMENTS

Since the clarinet performance of the Qing Dynasty has been developed to a certain extent, it has been found that the performance of clarinet music in the Qing Dynasty has further promoted the development of the art form at that time and has had a certain influence on the performance of modern national musical instruments. It is embodied in:

Improving the Skills of Playing Musical Instruments

The creation of modern folk music has a certain relationship with the characteristics of musical instruments. In the creation of modern folk music instrument works, the performance technique of the Qing Dynasty clarinet can play a certain role. For example, the creators will use clarinet playing techniques and techniques, such as breath control methods and fingering skills, to improve the integration and use of national musical instruments in the creation of modern national musical instrument works, and improve the player's control and expressiveness of instrument performance. In addition, clarinet players will also combine the concepts and techniques of classical Chinese music performance, such as the combination of portamento and vibrato expression techniques and composition, to enhance the work's depth and enhance the performance style's diversity. In the composition and performance of modern national musical instruments, the Qing Dynasty clarinet playing technique has a certain influence, and the Qing Dynasty clarinet can often help the musician improve their ability to express emotions and depict a unique scene. To this end, the composer could carefully arrange the relationship between the clarinet and other national instruments, and achieve complementarity while retaining the characteristics of the Qing clarinet performance. For example, in the creation of many works with ethnic customs, composers can combine the imitation and combination of the sound characteristics of traditional instruments by the Qing Dynasty clarinet to enhance the melodic lines of the composition (Xuan et al., 2017; Liu & Mozgot, 2020), so as to improve the melodic nature of the work. Fourth, cultural exchange and innovation. In the creation of modern national musical instrument works, composers can effectively learn from the analysis and understanding of the artistic value of the Qing Dynasty clarinet, and integrate Western instruments and elements of Chinese classical music into their own works, so as to give new connotations and values, and promote the further development of Chinese music, and

improve its openness and diversity. In this way, Chinese folk music creation innovation can be greatly enhanced. Clarinetists in the Qing Dynasty often used breath control to improve the timbre effect and achieve more diverse performance effects. The current creation of national musical instruments can also take advantage of this to improve the artistic expression of their own works, and create some works with the characteristics of timbre changes to highlight the musical charm of the works better. Second, fingering skills and speed changes. There were many innovations in the fingering techniques of the Qing clarinet playing, and the performers of the time could use a variety of fingering techniques to play the music better. To this end, modern folk instrumentalists can learn these techniques to explore how to improve tempo variation, coherence, and accuracy to make the performance more fluent. For example, in terms of fingering techniques, Qing clarinet players would constantly train themselves and strengthen their practice, mastering many different fingering techniques, such as quick switching and tremolo fingering, portamento fingering, etc. In this way, the means of musical expression can be enriched, and the sense of musical layering and expressiveness can be improved. Modern folk instrument players can strengthen their practice and exploration by borrowing the fingering techniques of Qing Dynasty clarinet performance and presenting a smoother and more precise musical effect in their performance. In addition, from the perspective of tempo changes, the performance of the Qing Dynasty clarinet will improve the musical expression based on the speed of the tempo change. They have good control over the tempo of their performances and create a smooth flow of dynamics and mood in the music. In the creation of modern folk musical instruments, breath control and performance skills play a key role in musical performance. Qing clarinets were often very good at shaping the timbre through breath control, and through different playing techniques, they could present various expressive effects. In this way, the artistic expression of the musical work can be stronger, and the emotion can be conveyed authentically, and the charm and artistic level of the work can be enhanced. Based on this, in the creation of modern national musical instruments, creators should draw on this breath control technique to present national music with multi-level musicality and a variety of timbre variations. In addition, performers should also improve their performance skills, constantly practice them, and improve their personal performance level to promote modern folk music's development. For example, when creating a work, the creator should promote the change of emotional level through the control of the light and shade of the timbre in the performance, show the unique personality of the musical melody and show the diversified timbre based on the performance skills and characteristics of different ethnic instruments. In this way, the creation of modern national musical instruments can be better developed and the creator's level of handling of details can be improved. At present, modern folk music performers can also learn from this, and in the performance, control the sense of rhythm and effectively adjust the speed change to better show the emotion of the work and improve the smooth expression of the music melody. Third, is emotional transmission. In fact, the music composition of the clarinet in the Qing Dynasty was always blank, and people at that time generally played Chinese classical music, and Chinese classical music paid great attention to the transmission of emotions, so this required the support of the virtuosity of the performers.

Enriching the Form of Instrument Performance and the Emotion of the Piece

The musical and artistic value of the Qing Dynasty clarinet includes that it can enhance the expression and transmission of emotions, which can inspire the creation of modern national musical instruments and affect the performance skills of performers. In the performance and creation of modern folk music, emotional expression and emotional transmission are undoubtedly very important; for example, they can improve the appeal of music and make people resonate. In the process of creation, composers are often inspired by the inner emotional expression function of Qing Dynasty clarinet music, and learn from it to better express the vividness of the work and their own inner emotions. First, the timbre changes. For example, composers can learn from this feature to use the breath control skills of the Qing clarinet to show the timbre changes of the music, increase the emotional delicacy of the work, and make the work more vivid. In the creative process, composers need to consider the melody and rhythm of the music, dynamic changes, etc. Moreover, the composer needs to be able to recognize that clarinet performance often needs to interpret the emotions contained in the music through some rhythmic and dynamic changes to express these emotions. Based on this, composers should consider the requirements of performers when creating modern national musical instruments to improve the artistic height of the works, so that performers can integrate their own performance experience, complete wonderful performances, and show the charm of music. At the same time, it also realizes personalized clarinet performance, and in the creation of modern national musical instruments, composers need to have a certain personality and style, especially to integrate their own personality and style into the creation. The timbre of the Qing Dynasty clarinet is melodious and moving, which can show the emotions in the music, and the clarinet performance also pays great attention to personalized interpretation, which is consistent with the artistry of the Qing Dynasty clarinet (Yang & Rui, 2022). Therefore, the creation of modern national musical instruments should pay attention to the transmission of musical emotions and combine the skills of clarinet performance in the Qing Dynasty to create works that

improve the emotional level of musical works and improve their appeal. In addition, the creator should also consider the musical structure and melodic arrangement of the work in combination with the performance characteristics of the clarinet to improve the musicality and emotional transmission level of the work. Fourth, innovative thinking and practical exploration. The use of clarinet skills in the Qing Dynasty can show a certain spirit of innovative thinking and practical exploration, which has a certain influence on the creation of modern national musical instruments, based on this, the creator should be able to analyze and understand the way of the Qing Dynasty clarinet performance, characteristics, expression techniques, etc., and always maintain the tradition, and at the same time, based on this to carry out effective innovation, so as to improve the vitality of modern national music. It is worth mentioning that many modern national instrumentalists and composers have been learning from the musical and artistic value of the clarinet in the Qing Dynasty and have made innovations in expressing emotions and personalized styles, to promote the further development of national musical art.

The use of the clarinet in the Qing Dynasty can show a variety of artistic styles and forms of expression, and based on this, the diversity contained in it has also profoundly impacted the creation of modern national musical instrument creators. First, explore different themes or emotions. The repertoire of the Qing Dynasty clarinet covers a variety of themes as well as emotional expressions, such as historical stories, and musical themes derived from folklore, such as cheerfulness and pathos. At present, modern folk instrument creators need to explore different themes and emotional expressions and pay attention to the expression of the connotation of the work, showing a variety of expressions so as to better improve the charm of music. Second, combine different forms of performance. The Qing Dynasty clarinet was played in a variety of forms, such as instrumental solos and chamber music. In creating modern national musical instruments, creators can combine various performance forms, new and old techniques, etc., to create more layered and rich musical works and more diverse works.

Promoting the Integration of Chinese and Western Music Cultures

The Qing Dynasty clarinet has great artistic development and high artistic value, which can have an impact on the creation of modern national musical instruments in terms of technical application and innovative development, and at the same time, it can also promote the innovation of modern national musical instrument performance methods and expressions. The artistic characteristics, techniques, and forms of expression of clarinet music in the Qing Dynasty can inspire modern artists who create national musical instruments, improve their understanding of the timbre, performance and comprehensive use of musical instruments, and continue to improve their individual clarinet creation level, and further explore the artistic expression techniques of national musical instrument creation, so as to improve the artistry of their works.

The art of clarinet performance in the Qing Dynasty shows the fusion of Chinese and Western cultures and a unique spirit of artistic exploration, which has deeply influenced the creators of modern national musical instruments. Based on this, many modern folk music creators have begun to be inspired and pay attention to integrating different cultural elements into their works to develop innovative ideas, which has affected the further development of Chinese folk music to a certain extent. First, a fusion of tradition and modernity. When creating their own works, creators of modern folk musical instruments sometimes draw on the spirit of fusion of Chinese and Western cultures embodied in the clarinet performance of the Qing Dynasty, and combine traditional elements with modern elements to express the characteristics of different musical works. For example, some creators have integrated the characteristics of clarinet instruments and traditional music elements with modern music styles to create musical works rich in national style and sense of the times. Second, multicultural exchanges. The significance behind the performance of the Qing Dynasty clarinet is very large, which can show the significance of multicultural exchange, and the creators of modern folk music works need to advocate in-depth exchanges and interactions between different cultures in their own works. At the same time, creators should be able to combine unique backgrounds to showcase different musical elements and use a variety of expressions to create cross-cultural musical works. Third, explore new areas and styles. Modern national instrument creators should learn from the history of clarinet performance in the Qing Dynasty, for example, to borrow this spirit of artistic exploration to bravely try new fields and new styles. To this end, creators can broaden their musical horizons, expand their music creation ideas, and promote the further development of music art through some experimental creations. In musical works, the transmission of culture is significant. Their skill in conveying culture characterizes the performance of Qing clarinet players, and showing a strong artistic appeal, to impress the audience and allow them to have a rich cultural resonance. Based on this, in the process of creation, the creators of modern national musical instruments can better understand the deep connotation of the creation of musical works through the reference to the skills of the Qing Dynasty clarinet performance in cultural expression, and feel the cultural connotation of modern national instrument performance based on this, and at the same time, in the process of creation, the national culture, so as to better draw inspiration and create works rich in cultural level. In addition, creators can also deepen their understanding and experience of Qing Dynasty clarinet music, so as to better understand the shortcomings of their own creations, and at the same time, optimize their own works.

For example, creators can also rework their works by borrowing from delicate clarinet playing techniques to make these works more suitable for modern national instruments and improve the cultural depth of the works to resonate with people. In this way, his musical works' cultural expression and emotional appeal can be enhanced. At the same time, this can also promote a virtuous circle of the creation ecology of modern national musical instrument works to a certain extent. Through the excavation of the musical and artistic value of the clarinet in the Qing Dynasty, it can be seen that the creation of modern national musical instruments can obtain a lot of valuable materials or resource contents: first, the excavation of timbre characteristics. When the Qing Dynasty clarinet is played, its timbre is very clear and bright, with full artistic appeal and musical expression, and has a strong cultural and emotional transmission effect. Based on this, modern folk music creators can get some inspiration from the timbre characteristics of the Qing Dynasty clarinet, and draw inspiration from it, deeply explore the timbre characteristics of a variety of ethnic instruments, and combine and use the different timbre characteristics of these instruments to carry out ingenious combinations, based on which to carry out further creation, so as to make their music works more layered and expressive. Based on this, they can better enrich their creative materials, improve their works' style diversity, timbre charm and personality, and show the unique value of music and art. For example, in the creation of folk instrument pieces, the creator tries to combine the unique timbre of the clarinet (bright and clear) with the timbre of other instruments (warm and soft) to create a more layered and charming musical work. This fusion of the timbre of multiple instruments can better enrich the expression of musical works, and at the same time, bring a refreshing feeling to the listener, improve the listener's listening experience, and improve the attractiveness of the music itself.

CONCLUSION

This paper conducts a detailed study of the musical and artistic value of the clarinet in the Qing Dynasty, and focuses on the analysis of the musical characteristics of the Qing clarinet performance, breath control techniques, performance techniques and other characteristics. The results show that the clarinet of the Qianlong period (1736~1796 AD) is consistent with the national musical instruments in terms of structure, material, shape and sound, such as dizi and Xiao, and the clarinet of the Cixi period (1835~1908 AD) presents the characteristics of diversity, with the characteristics of the integration of Chinese and Western cultures, such as the flute, pipe length, horn diameter, resonance position, etc., the clarinet voice changes from low frequency to high frequency, and the scope of application is developed from the court to the people. Therefore, the clarinet in the Cixi period (1835~1908 AD) has more national characteristics, resulting from the exchange of Chinese and Western musical instruments, and promotes the development of modern musical instruments to the people. Therefore, the Qing Dynasty clarinet had a profound impact on modern national musical instruments in terms of cultural connotation, shape and structure, promoted the development of clarinet performance skills, and had more musical characteristics and enriched the connotation of modern music culture. There are some shortcomings in the research in this paper, mainly because there is a few Qing Dynasty data on clarinet and incomplete public literature on clarinet. In the future, more information about Qing Dynasty clarinets will be collected for in-depth analysis.

REFERENCES

- Almeida, A., Li, W., Schubert, E., Smith, J., & Wolfe, J. (2023). Recording and analysing physical control variables used in clarinet playing: A musical instrument performance capture and analysis toolbox (MIPCAT). *Frontiers in Signal Processing*, 3, 1089366.
- Chernaya, M., & Zhao, Y. (2019). Peculiarities of clarinet concertos form—Building in the second half of the 20th century and the beginning of the 21st Century. *Agathos*, 10(1), 177-188.
- Gao, H., & Li, F. (2024). The application of virtual reality technology in the teaching of clarinet music art under the mobile wireless network learning environment. *Entertainment Computing*, 49, 100619.
- Hope, C., & Robinson, C. (2017). Occam Hex II: A collaborative composition. *Tempo*, 71(282), 18-28.
- Ito, T., Honma, Y., Hijioka, S., Kudo, A., Fukutomi, A., Nozaki, A., . . . Shimatsu, A. (2017). Phase II study of lanreotide autogel in Japanese patients with unresectable or metastatic well-differentiated neuroendocrine tumors. *Investigational New Drugs*, 35, 499-508.
- Kılıç, K. (2023). Türk müziği ve batı müziğinde kullanılan albert ve boehm sistem klarnet türlerinin farklılıklarının değerlendirilmesi [Evaluation of the differences of albert and boehm system clarinet types used in Turkish and classical music]. *Sanat ve Tasarım Dergisi*, 13(2), 608-619.
- Lanza, S. (2022). Invenzione/Analisi dell'invenzione. L'esperienza di una circolarità senza fine [Invention/Analysis of the invention. The experience of an endless circularity]. *Rivista Di Analisi E Teoria Musicale*, 28(1), 7-41.
- Liu, Y., & Mozgot, S. A. (2020). The making of woodwind art in China. *Amazonia Investiga*, 9(27), 301-310.
- Nikolaievska, Y., Paliy, I., Chernenko, V., Tsurkanenko, I., Lozenko, K., Yurchenko, O., & Dikariev, S. (2022). Instrumental fantasy in the 20th century: Variations on the genre-style genotype. *AD ALTA: Journal of Interdisciplinary Research*, 12(2), 193-198.
- Payne, E. (2018). The craft of musical performance: Skilled practice in collaboration. *Cultural Geographies*, 25(1), 107-122.
- Pusceddu, S., Vernieri, C., Di Maio, M., Prinzi, N., Torchio, M., Corti, F., . . . de Braud, F. (2021). Impact of diabetes and metformin use on enteropancreatic neuroendocrine tumors: Post hoc analysis of the clarinet study. *Cancers*, 14(1), 69.
- Roh, H., Oh, S., Song, H., Han, J., & Lim, S. (2022). Deep Learning-based wireless signal classification in the IoT environment. *Computers, Materials & Continua*, 71(3), 5717-5732.
- Sharma, N. N., Jain, R., Pokkuluri, M. M., Patkar, S. B., Leupers, R., Nikhil, R. S., & Merchant, F. (2023). CLARINET: A quire-enabled RISC-V-based framework for posit arithmetic empiricism. *Journal of Systems Architecture*, 135, 102801.
- Strosberg, J. R., Halfdanarson, T. R., Bellizzi, A. M., Chan, J. A., Dillon, J. S., Heaney, A. P., . . . Bergsland, E. K. (2017). The North American Neuroendocrine Tumor Society consensus guidelines for surveillance and medical management of midgut neuroendocrine tumors. *Pancreas*, 46(6), 707-714.
- Suurpää, L. (2023). Longing for the Tonic in Robert Schumann's 'Meine Rose' Op. 90 No. 2 and Fantasiestück Op. 73 No. 1. *Nineteenth-Century Music Review*, 20(2), 385-408.
- Velut, L., Vergez, C., Gilbert, J., & Djahanbani, M. (2017). How well can linear stability analysis predict the behaviour of an outward-striking valve brass instrument model?. *Acta Acustica united with Acustica*, 103(1), 132-148.
- Worthington, E. (2020). 'The Uttermost Perfection of All Wind Instruments': Franz Tausch (1762–1817) as virtuoso clarinetist and director of the conservatorium der bläseinstrumente in Berlin. *Music and Letters*, 101(2), 238-269.
- Xuan, Z., Manning, L., Nelson, J., Richmond, J. E., Colon-Ramos, D. A., Shen, K., & Kurshan, P. T. (2017). Clarinet (CLA-1), a novel active zone protein required for synaptic vesicle clustering and release. *Elife*, 6, e29276.
- Yang, L., & Rui, C. (2022). История методики обучения игре на кларнете в Китае и России [History of teaching style of playing clarinet in China and Russia]. *Вопросы Истории*, 12(1), 224-235.