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THE EVOLUTION OF MUSICAL TUNINGS AND THEIR INFLUENCE ON INSTRUMENTAL CULTURE: HISTORICAL, THEORETICAL AND CULTURAL ASPECTS

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Abstract

This article is devoted to a comprehensive study of the evolution of musical tunings and their role in the formation of instrumental culture. Based on the analysis of researchers' works (Lobanov, Garbuzov, Kharlap, Barbour, Lindley, Korykhalova, Lebedev), the key stages in the development of musical tunings, their influence on the design and tuning of instruments, as well as the connection with the aesthetic, cultural, and philosophical ideals of various eras are considered. Special attention is paid to the transition from meantone temperament to equal temperament, which became an important stage in the history of music, influencing composition, performance practice, and the development of musical instruments. The article also touches upon the issues of pitch perception and its relationship with musical tuning, as well as the role of folk traditions in the formation of musical systems.

Keywords: *Musical tuning, instrumental culture, meantone temperament, equal temperament, acoustics, performing practice, zonal hearing, folk music*

Introduction

Musical tuning, as a system of organizing pitch relationships, plays a key role in the formation of musical culture. Its evolution is closely related to the development of instruments, compositional techniques, and performance practices. This article examines the main stages in the development of musical tunings, their influence on the design and tuning of instruments, as well as their connection with the aesthetic, cultural, and philosophical ideals of various eras. Special attention is paid to the transition from meantone temperament to equal temperament, which became a significant milestone in the history of music, influencing composition, performance practice, and the development of musical instruments.

The history of musical tunings spans several millennia, starting with ancient systems such as the Pythagorean tuning, based on pure fifths. This tuning, developed in An-

cient Greece, was based on mathematical ratios and was considered ideal for monophonic music. However, its limitations in using thirds led to the search for new solutions during the Middle Ages and the Renaissance.

Materials and Methods

The research is based on the analysis of historical, theoretical, and cultural aspects of musical tunings. The study employs a comparative analysis of different tuning systems, their influence on instrument design, and their role in performance practices. The works of prominent researchers such as Lobanov, Garbuzov, Kharlap, Barbour, Lindley, Korykhalova, and Lebedev are used as the primary sources for this study.

Results and Discussion

During the Middle Ages and the Renaissance, the meantone temperament dominated, allowing for pure thirds, which was crucial for polyphonic music. As noted by M. Lobanova, the meantone temperament was adapted for harpsichords and organs of the Baroque era, enabling pure sound in certain keys. However, the limitations of the meantone temperament in using various keys led to the search for new solutions (Lobanova, M., 1994).

The transition to equal temperament in the 18th century became a revolutionary stage in the history of music. This tuning, based on dividing the octave into 12 equal semitones, allowed for free modulation between keys and expanded the technical capabilities of instruments. As noted by S. Lebedev, equal temperament became the standard for keyboard instruments, influencing the development of Western music (Lebedev, S., 1987). J. M. Barbour emphasizes that the introduction of equal temperament opened new possibilities for modulation and chromaticism, which became an important step in the development of musical language (Barbour, J. Murray. 1951).

Musical tunings significantly influenced the design and tuning of instruments. During the Baroque era, harpsichords and organs were adapted to the meantone temperament, allowing for pure sound in certain keys (Lobanova, M., 1994). The transition to equal temperament required changes in the design of instruments, such as the piano, which became more versatile and suitable for performance in different keys.

M. Lindley highlights that luthiers and viol makers took into account the requirements of various tunings when creating instruments. For example, the scale and fret placement on the neck were adapted to specific tunings, which influenced the acoustic characteristics of the instruments. In particular, the meantone temperament required specific instrument tuning, which affected their design and playing technique (Lindley, Mark. 1984).

N. Korykhalova notes that changes in tunings directly influenced performance practices (Korykhalova, N., 2000). For example, during the Baroque era, the use of meantone temperament required performers to pay special attention to intonation and expressiveness. The transition to equal temperament opened new possibilities for modulation and chromaticism, which influenced composition and playing techniques.

N. Garbuzov introduces the concept of "zonal hearing," explaining that human perception of pitch is not absolutely precise but occurs within certain "zones." This allows for some degree of freedom in tuning instruments, which is especially important for vocalists and string players. The zonal nature of hearing also explains why musical tunings based on precise mathematical ratios are perceived as harmonious (Garbuzova, N., 1955).

Musical tunings are not only a technical but also a cultural category, reflecting the aesthetic ideals of their time. As noted by J. M. Barbour, each tuning required certain changes in instrument design, reflecting the needs of musical practice and composition. For example, during the Baroque era, the desire for expressiveness and contrasts influenced the design of instruments, which were created with these ideals in mind (Barbour, J. Murray. 1951).

M. Kharlap emphasizes that folk music systems, based on natural acoustic principles, were formed under the influence of cultural traditions. For example, Russian folk instruments such as the gusli and balalaika were tuned in a diatonic scale, which corresponded to the modal organization of folk songs. The author also notes that folk craftsmen intuitively took into account acoustic laws when creating instruments, reflecting

their connection with nature and the environment (Kharlap, M., 1972).

Folk musical traditions played an important role in the formation of musical tunings. M. Kharlap explores the unique features of Russian folk music, including its modal organization and rhythmic structures (Kharlap, M., 1972). He emphasizes that the folk musical system is based on natural acoustic principles, which are reflected in the tuning of folk instruments. For example, the gusli was often tuned in a diatonic scale, corresponding to the modal organization of folk songs.

The author also draws attention to the connection between the rhythmic structures of folk music and its tuning. For example, irregular rhythms and polymeter were often accompanied by specific instrument tunings. M. Kharlap shows how elements of folk tuning and modal systems influenced the development of Russian classical music. Composers such as M. Mussorgsky and N. Rimsky-Korsakov used folk motifs and tunings in their works.

Of particular interest is the work of A. Petrosyants, dedicated to the reconstruction of Uzbek folk musical instruments (Petrosyants, A., 1951). His research and practical activities in this field demonstrate how traditional musical tunings and acoustic principles influence the construction and tuning of instruments. Petrosyants, relying on historical sources and ethnographic materials, reconstructed instruments such as the "doyra," "rubob," and "nay," taking into account their authentic sound and traditional tunings.

The reconstruction of Uzbek instruments involved not only restoring their appearance but also accurately reproducing their acoustic characteristics. For example, the "rubob" was tuned in accordance with traditional modal systems characteristic of Uzbek folk music. This required a deep understanding of both acoustic laws and cultural traditions associated with the use of the instruments.

Petrosyants also paid attention to adapting instruments to modern conditions, which involved making changes to their construction to improve sound quality and playability. However, these changes did not compromise the authenticity of the instruments but rather enhanced their functionality. For example, during the reconstruction of the "doyra" (drum), traditional materials such as wood and leather were used, but the acoustic properties of the instrument were improved through more precise tuning of the membrane.

Petrosyants' work demonstrates how traditional musical tunings and acoustic principles can be preserved and adapted in modern musical practice. His contribution to the reconstruction of Uzbek folk instruments not only helped preserve cultural heritage but also enriched contemporary musical culture, providing musicians with the opportunity to perform traditional music on authentic instruments.

Conclusion

The evolution of musical tunings has played a key role in the development of instrumental culture, composition, and performance practice. The transition from meantone temperament to equal temperament was an important milestone in the history of music, influencing the construction of instruments and the expansion of musical language. The study of musical tunings helps to understand how musical traditions have developed under the influence of technological and cultural changes, which is significant for both music historians and contemporary performers and craftsmen.

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