

THE SCIENTIFIC AND PERFORMANCE FOUNDATIONS OF THE NAY INSTRUMENT: IN THE LIGHT OF AL-FARABI'S TEACHINGS

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Annotation: This article presents a scientific analysis of the musical art of ancient Central Asia and the symbolic role of the *nay* (reed flute) in expressing the harmony between humans and nature. Drawing upon Abu Nasr al-Farabi's "*Kitab al-Musiqa al-Kabir*" (*The Great Book of Music*), it explores the acoustic, physiological, and aesthetic characteristics of the *nay* sound, emphasizing its place within the structure of musical thought. The study also examines the theoretical and practical aspects of developing auditory skills, intonation accuracy, timbral sensitivity, and rhythmic perception in *nay* performance. Moreover, it links al-Farabi's philosophical and musical concepts to contemporary *nay* performance practice, scientifically substantiating their role in enhancing musical perception and aesthetic consciousness.

Keywords: Musical performance, al-Farabi, *nay* (reed flute), ancient music, Eastern philosophy, acoustics, timbre, intonation, auditory perception, *maqom*, spirituality, musical cognition, performance, breathing, aesthetic thinking, musicology.

In ancient Central Asia, the art of music was formed as a product of harmony between humans and nature. Musical instruments such as the *nay*, *ud*, and *doira* were closely connected with people's daily lives, religious rituals, and customs. Archaeological discoveries — including the depiction of a double-pipe flute found among the ruins of the ancient city of Sangin in Bactria — show that music was an inseparable part of human life even in those times. The earliest types of *nay* include the clay *nay*, *g'ajir nay*, double-pipe *alvos*, and *bulamon*. In particular, the *g'ajir nay*, made of bone or reed, was widespread among shepherds. Therefore, in Eastern musical thought, the *nay* was regarded as a symbol of spirit and delicacy. This understanding preserved its significance through later centuries.

In the history of Eastern musical thought, the great philosopher and musicologist Abu Nasr Muhammad ibn Uzlug Tarkhan al-Farabi (873–950) holds a special place. He was a prominent representative of medieval Eastern philosophy, natural sciences, logic, music, and art, and one of the first scholars to systematize musical knowledge scientifically. In his works, al-Farabi explained the art of music not only as a practical activity but also as a system based on scientific, acoustic, and philosophical principles. According to sources, al-Farabi was a skilled performer on instruments such as the *ud*, *tanbur*, *ghijjak*, *chang*, *qanun*, and *nay*. He expressed particularly profound ideas about the sound production mechanism, acoustic characteristics, and intonational system of the *nay*. According to al-Farabi's theory, the *nay* is one of the most ancient instruments connected to the natural power of human breath and is interpreted as "a means that allows a person to express his inner spiritual state through musical sounds."

Al-Farabi considered the *nay* the instrument closest to the human voice. He analyzed the harmony between breath, resonance, and sound vibrations, and in his work *The Principles of the Science of Music* (*Kitāb al-Mūsīqā al-Kabīr*) he wrote in detail about the frequency ratios of *nay* sounds, their harmonic structure, and their range. The scholar emphasized that the *nay* has not only aesthetic but also physiological and spiritual effects. In Al-Farabi's time the *nay*

occupied an important place in the ceremonial, religious, and court music of Eastern peoples. He scientifically analyzed the various forms of the nay that existed in his era — variants differing in length, number of holes, and pitch range. His research in this area laid the groundwork for the formation of nay-playing schools in Central Asia, Iran, Turkey, and the Arab world in subsequent centuries. Al-Farabi achieved high distinction not only in theory but also in practical creativity. By playing the nay he was able to affect listeners' emotions, which later gave rise to popular legends describing him as “the wise musician who played the nay and made people weep and fall asleep.” Thus, Al-Farabi's contribution to the history and theory of the art of the nay is inestimable. He analyzed the nay as a natural phenomenon connected to human spirit and breath, elevating it to a central symbol of Eastern musical thought. Even today Al-Farabi's ideas provide a scientific foundation for many studies on nay performance, breathing technique, and the effects of musical tones on the human psyche.

Today, the nay holds a leading position as an instrument in folk melodies, maqoms, and ensembles. It has been preserved among various peoples under different forms and names — such as ney, duduk, kaval, tutak, limba, and di, among others. This diversity demonstrates the widespread influence of ancient nay culture on world music. The legacy of Al-Farabi and the ancient nay tradition are interrelated, uniting the idea of understanding human inner harmony and the unity of nature through musical sound. Because the nay cannot be tuned with complete precision, playing it requires a highly sensitive perception of even the smallest intonational nuances, as well as correcting higher tones through controlled lip movements. The instrument's tone scale possesses a distinctive variety of timbres. The ability to perceive these timbral qualities is developed during musical exercises that focus attention on the color and texture of sound. Alongside sensitivity to slight intonational inaccuracies, a refined sense of timbre plays a vital role in nay performance. The quality of perceiving intonation and timbre varies from one performer to another. A performer who is highly sensitive to tonal color and works diligently on self-improvement achieves not only intonational purity but also enhanced timbral quality. Conversely, a performer who lacks self-demand may become accustomed to poor sound quality and incomplete timbre. For a nay performer, a well-developed ability to distinguish sounds by ear is essential; however, those who possess an exceptionally acute auditory discrimination ability (able to recognize and differentiate tones without comparison) have significantly greater artistic potential

The process of identifying and memorizing sound timbres on the nay plays an important role in developing a performer's skill. The rich variety of the instrument's timbres enables the player to distinguish sound colors quickly, retain them in memory, and develop musical thinking. For a nay performer, the ability to imagine, find, and perform high-pitched tones in practice is the result of coordination between hearing and motor activity. This process is formed through the close connection of sound imagination, movement sensation, and musical perception.

Systematic practice is essential for the development of hearing. By maintaining intonational accuracy, determining the tonality of a piece, understanding modal (lad) functions, and performing chord exercises regularly, the precision of hearing becomes stronger. Solfeggio exercises are one of the main pedagogical tools for developing musical perception; they help the student learn to hear, remember, and accurately reproduce musical sounds. Dictation

exercises, both one-voice and two-voice, further improve musical thinking and activate the hearing analyzer. During practice sessions, it is necessary to regularly check the nay's tuning base using a tuning fork or instruments with fixed pitch, to control intonational accuracy. This process sharpens the sense of hearing and helps the performer correctly determine pitch levels. At the same time, a nay performer must be able to distinguish the timbre of their instrument, imagine pitch without playing, and mentally reproduce or model the sound they hear. Along with the development of hearing, a sense of rhythm must also be cultivated. The ability to feel rhythm precisely, understand the proportion of note durations, and apply them correctly during performance is an integral part of musical thinking. At the beginner stage, the teacher develops the student's synchronization of time and movement through rhythmic exercises, which later enables the correct and expressive performance of more complex musical works.

Thus, the development of a nay performer's musical ear, intonational accuracy, and rhythmic sense requires continuous and systematic practice. This process is not limited to improving technical skills — it also plays a crucial role in shaping the performer's aesthetic perception, musical thinking, and professional performance culture. Based on many years of experience at the Department of Traditional Singing of the Faculty of Art Studies, Gulistan State University, in the fields of nay performance, pedagogy, and research, it has been confirmed that Abu Nasr al-Farabi's theoretical and aesthetic concepts of the nay remain highly relevant to modern music education. In Farabi's doctrine, the nay is described as a musical instrument that conveys the natural power of human breath and expresses inner emotional states. These ideas align closely with current educational practices focused on proper breath control, accurate timbre recognition, and achieving clear intonation.

Pedagogical experience shows that lessons and exercises based on Farabi's musical theory have a positive impact on students' development of musical hearing, rhythmic awareness, and aesthetic thinking. Therefore, Farabi's musical heritage, particularly his insights on the nay, continues to serve as an important creative, theoretical, and educational foundation in the field of traditional performance and contemporary music education.

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