

# THE RELATIONSHIP BETWEEN MUSIC AND SCIENCE ACCORDING TO THE PHILOSOPHERS OF ABBASID ERA

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## Introduction

The comprehensive view of the sciences of the Abbasid philosophers has led to the realization of the relations between these sciences. Every fact has to do with other related facts, albeit to varying degrees! Hence, they built their musical theory on scientific bases, and according to what they have reached from the diverse sciences of their era.

One of the most important objectives of this paper is to study the scientific aspects behind the development of musical theory among the philosophers and scientists of the Abbasid era. And to express their views on the influence of science in musical theory, and the influence of musical theory on the expansion of study and research in other sciences.

Philosophers and scientists' interests in musical theory, their research ethics and their status among science, have led them to discover the relationship between music theory and their studies for a number of sciences like; mathematics, arithmetic, and the human soul, as well as its relationship with other organisms such as animals and plants.

The present study was based on four aspects. The first topic examined the term "music" in the Abbasid period. The second section studied the musical theory of the Abbasid philosophers, while the third section defined music as a science of the Abbasid era. The fourth section dealt with the relationship of philosophical theory and mathematics, astronomy, medicine, psychology, animals, and plants as well as Arabic poetry.

### 1. The Term Music and its Synonyms in the Abbasid Era

The term "Music" was imported from Greek to Arabic along with the translation activity of Greek and Roman Science. Especially in the Abbasid era. As stated in the words of Nadim: (Who moved books from the country of the Romans), Muhammad and Ahmed and Hassan ibn Shaker Al Munajjim... they did the best and carried out Haneen ibn Isaac and others to the country of the Romans; came to them books and strange works of literature in philosophy, medicine, engineering, mathematics (arithmetic or arithmetical) and music.

The philosopher Al Kindi was the first to transfer the term music into Arabic, and to introduce the concept of musical theory into Arabic culture, while at the same time taking his own view of this theory. He left writings that are considered rare in "musical philosophy and philosophical music, according to him "it is a science that completes philosophy".

It is well known that the use of the term "music science" was confined to philosophers and scientists. Theoretical music was derived from mathematical theory; it was one of the origins of mathematics, and it was recognized by Muslim philosophers, in their explicit scientific form, as "the science of music" Is the "third art of mathematics" as Avicenna stated in his book "Healing" on a part of mathematics, where he put it under the title "Collectives of the science of music".

As Muslims in the Abbasid era to launched the term "Craft" on science, so writing and publishing is a craft (a trade or a profession) according to them. Therefore, the philosophers and scholars of Islam in the Abbasid era launched the term "Craft" on theoretical music, considering it as a science. In the work of Al Kindi, a number of titles came in like "the authorship industry" and "the music industry".

Muslim philosophers and scholars have distinguished between the knowledge of music as a science and between music as a shroud and creativity, while the titles of the function of the artistic purpose, such as the craft of sound and the craft of singing (weights, melodies, melodies and rhythms), and the craft of composition as Al Kindi entitled one of his volumes: "The Great Message in Composition" In this regard, Ibn Zila says: "The science of music involves two types of research: the first is looking for the conditions of tunes, in terms of agreement and dissociation, and is called the science of composition, and the other is looking for the amounts of time between the melody and is called rhythmology [similar melodies]... The science of composition is the ultimate goal of the science of music which adopts the knowledge of melody, and knowledge of rhythms".

The terms of rhythm, melody, and tunes were among the philosophers as disciplines in theoretical and practical music. The translation movement was already translated as Yunus Al Kitab's work, "The Book of Tunes", and continued to be translated into Al Kindi's works "Letter in rhythm", "Arrangement of the tunes" and " Melody and Tunes".

The term "songs", which are poems with tunes and rhythm, has been circulated by writers and scholars of the Abbasid period, as in the book "Songs" by Al-Asfahani. While the term "sounds" according to the musicians meant melodies, such as the words of the brothers Al Safa: " music melodies are sounds and tones". While the term "hearing" and meant songs and melodies and rhythms, circulating exclusively with jurists and legislators.

## **2. Music Theory according to Abbasid Philosophers**

The Arabs knew the theory of music, its origins, and its proponents by translating it from the Greeks in the second century A.H. and included in the research of Muslim philosophers and scholars. Although the most scientific aspects of Arabic musical theory were derived from the Greeks, the Arabs added Arabic rules and methods to them which were commonly used in the practical art of music. Since the Arabic language in the Abbasid era was the language of science and society upscale in all Muslim countries, the Abbasid philosophers studied the messages written in the Greek musical theory in Arabic after translation.

The ancient Greek musical theory was of great importance to the philosophers of the Abbasid era, and although it was extinct long before the advent of Islam, its basic roots remained clear when translated from Greek to Cyrillic and to Arabic. The translation of Greek epistles, particularly musical theory and the natural rules of sound, has led Muslim philosophers to deal with music experiments themselves as one of the most remarkable aspects of their efforts.

The philosophers and the theorists of the Abbasid era did not accept the views of the Greek philosophers in their musical theory because they saw obvious errors in this theory. And therefore they have proved in their writings with the knowledge of music and in practical and applied, these errors in theory and worked to modify, improve and add to it. So, they fully equated their work with astronomy when they corrected the errors of Ptolemy. The musical theory developed by the Muslim philosophers of the Abbasid period was thus far more advanced compared to the Greek theory.

He was known for the philosophers of the Abbasid era who studied the science of music with their prophecies and mausoleums. Al Kindi, who died in 255 AH / 868 AD, was not preceded by any of his contemporaries in philosophy and logic, and his knowledge of medicine and his competence in engineering, mathematics, astronomy, and nature, as well as his proficiency in literature: grammar and poetry. Al-Farabi, who died in 339 AH / 950 AD, was also a famous philosopher in logic, ethics, politics, astronomer, and mathematician, as well as his poetry. Avicenna, died in 428 AH / 1037 AD, was a scholar of medicine, mathematics, chemistry and had knowledge of poetry as well as philosophy.

Al-Farabi stressed that music is a science where it is based on the laws and proofs, which were inherited and changed in terms of the relevance of his time, saying: "We have come in the first article of this book [the great music book] on the first principles that belong to this industry, which is to raise all the evidence used in something of this science if analyzed on the contrary, And we described the laws in which we can extract the tune and dimensions and the number of parts of the extraction of parts close to the outlet, and reached in the extraction to be surrounded by the tone of the tune and dimensions used, and what may be used than what has not been customary to this time and all of its functions, and when a person likes to increase the tone and dimensions, or to replace the last of the last place we extracted; it is not difficult to do that if you keep in it what is required by the laws that we have described there".

Muslim philosophers, including Al-Farabi, have realized that they are in the process of advancing and adding to science, which begins by refuting the erroneous views of those who preceded them with science with strong arguments and compelling proofs. In his book "The Great Book of Music," he emphasizes this important aspect of the evolution of science: "We viewed the most famous scholars of the industry and explained the ambiguity of their stories and we examined the opinion of each of whom we knew the opinion proved in a book and shown how much each of them reached, in the collection of what in this science and corrected the imbalance in their opinion".

Perhaps the most prominent invention of both Al-Farabi and Avicenna, in the theoretical music and the theory of the natural principles of sound, is the development of new rules that determine the musical distances in the system of musical centers, which were accepted and spread; thus they destroyed the basis of the Greek diatonic and pyramidal (strong and natural) progress in their musical theory".

## **3. The Scope of Music Science among Philosophical Sciences**

Since its inception, philosophy has encompassed all other sciences. The music was one of them, Abbasid philosophers emphasized the relationship of music to science, and made it part of mathematics or a branch of it.

In their classification of science, Al Kindi and Al Farabi placed music within the middle science which is mathematical science and thus defined music in the quadrivium group: geometry, numerology, arithmetic (mathematics).

Al-Kindi explains the importance of the science of music by stating its position among the sciences: "Philosophers were usually focusing on the middle science, between the science beneath it and the science above it; either beneath it which is the knowledge of nature and what it realizes. The one above it is called metaphysics which

is above nature but its effect is apparent in nature, The Middle science, which draws to the knowledge from above and below it; divided into four sections:

1. Arithmetic (numbers).
2. Composition (music).
3. Geometrics (Engineering).
4. Astronomy (astronomy and astrology) "

Therefore, music according to Al Kindi is a science and knowledge that must be acquired by study and research and in his advice to the musician he emphasizes that since it is also imperative that the doctor to take into account many things before the preparation of treatment, it is also necessary for the musician to do the same thing before composing melodies. "The brilliant musician knows what makes everyone who seeks rhythms, melodies, and poetry, such as the need of a philosopher, to know the conditions of those seeking treatment or maintaining his health."

Al-Kindi treated music as a science in various respects. For example, the reason for hearing voices, which is the result of the sound waves, is that these waves pass through the ether to reach the ear. He also explained the features of the arrangement of the sound; he found that the rhythm comes from the arrangement of specific musical tones every tone of the rhythm carries a precise degree and therefore cannot get the same rhythm increase or decrease that degree, and here the rhythm is generally only a repetition of similar musical tones.

Al-Kindi developed his plan and methodology in the study of music science, based on five directions, namely:

1. sound (melodies).
2. time (rhythms).
3. Psychological direction.
4. medical direction.
5. Astronomical direction.

Al-Farabi had the same opinion saying: "This science is derived from the science of astronomy, the science of wisdom, and the science of nature. It has an interest in all these sciences."

Al-Farabi expressed his opinion on the relationship of music to a number of sciences, saying: "The observer in the music industry is considered with several sciences and subjects of which are complex; the tunes and their quantities and their characteristics and their associations and characteristics, subjects in the natural sciences, and then parts of the rumors associated with the tune, its weights, types, topics of language sciences are distinguished by different languages, dialects, and methods of composition. The music industry may be related to other sciences that are not homogenous in nature, such as medicine."

It is noted that Ibn Sina also did not stop his meditations and research on a specific aspect of the science of music, but included everything related to it; from physical, mathematical, medicine and psychology.

#### **4. The Relation of Music with Sciences**

##### **4.1 The Relation with Mathematics and Geometry**

There is no doubt that musical theory was developed in the light of mathematical theory, hence the science of music is part of mathematics. If we know that musical time calculates the difference between a musical sign and its answer with a complex mathematical equation; for example, the frequency of a musical sign equals twice that of the musical score itself. All points of convergence are combined with a rectangle (or octave).

Pythagoras, who is credited for the development of musical theory, emphasizes the importance of mathematics in music: "all things are numbers", meaning that all relationships in natural phenomena are based on numbers. From his idea, the accurate observations on music (sound) was originated. It was concluded that each tone had a weight and mathematical expression.

Pythagoras also noted that the vibrations of the strings of musical instruments are produced in a coherent rhythm when the lengths of strings are full or non-fractional, and this phenomenon is evident in all string instruments. This is what the brothers of the Safa pointed out by saying: "Pythagoras the Wise heard the essence of himself and the intelligence of his heart, the rhythms of the movements of the planets so that he produced the quality of his music, the origin of the music and the melodies of the melodies. He was the first to speak in this science and tell this secret of the wise."

Perhaps the most striking issue of the close relationship between the science of music and mathematics is the codification of the Pythagorean musical scale. It is worth mentioning that philosophers and musicians, especially the Greeks, set the musical scale in the light of what they formulated in mathematics. They divided the string into sections called *pece*, and this ladder became the final form on which all successive stairs were modified.

It is worth mentioning that the Muslim philosophers in the Abbasid era took the Greek *pece* as it is, and considered it the original because it is the most beautiful and the most correct, and worked in its renewal and additions and care in organizing. After two thousand and five hundred years, we find that the many stairs that were developed, including the natural scale (Harmony), which is the Great European scale, and the chromatic scale, are of

one origin that has been modified from the Pythagorean Greek scale; There were three hundred (300) distinct voices, only a few voices gathered in one musical scale?

Al-Kindi pointed to the close relationship between music and mathematics. "The complement of music is the subject of authorship, in numerical terms proportionately proportional to the pernicious symptoms of numerical utterance and at equal intervals of the same, which are usually called rhythm. As we have shown in our book in numerical narratives, and in our book in the temporal ratios, but we say here is some complementary to the industry of authorship of the known industry of colloquial and temporal relations ."

Al-Farabi stressed the relationship of music to mathematics and engineering by saying: "It is necessary for the observer in this industry to know from numerical occasions some of their varieties, detail, and composition, but this is known from the industry of numbers".

Al-Farabi elaborated on the details of this relationship and said: "When they were involved in the engineering industry and to make our intention here of the melody of what follows in its longest shared; then it must be the amplified tone, which we see here in the proportion of the number to (Weights), it has been shown that some of the industry's principles may also be taken from the engineering industry".

In his emphasis on the relationship between music and science, Avicenna said: "Music is a mathematical science, in which it searches for the conditions of the melody in terms of the recitation of the tune and the time between them, to learn how to compose the melody. The limit of music is that it includes two searches; one is the search for the conditions of the melody themselves and this section is specialized in the name of rhythm science. Each of them has the principles of another science and those principles are numerical, some of which are natural, and are almost geometrical in some cases."

Avicenna's idea of codification of rhythmic cycles, an original attempt and more judgments using musical analysis, combined the dramatic interaction of Arabic poetry with the temporal unity of rhythm, the indivisible unit of time, which consists of repetitive rhythms. His idea was taken by his disciple, the Ibn Zela, who died in 440 AH / 1048 AD. Ibn Zeila used the letters in their arithmetic sense as successive numbers to express the tones.

#### **4.2 The Relation with Astronomy**

The Arab philosopher Al -Kindi saw that there is a connection between heavenly music and celestial bodies, the same as the idea of Pythagoras in the inaudible music of the celestial bodies that move around the earth, and he tried to explain this idea and prove it in many of his letters.

Al-Kindi's idea of linking music with astronomy came from the philosophy of the ancient Greeks that the events of the universe are linked to each other according to the theory of influence and effect, and that "everything in the world is affected by the upper world". Al-Kindi has linked the seven tones of musical peace with the planets, the four courses of oud, and between the twelve signs of the zodiac. Al Kindi compared the four strings to the quarters of the zodiac, and the quarters of the moon, and the four elements, and the wind of the four sides, and the seasons of the year, and the four quarters of the month.

Some of the views of Al Kindi moved to the Safa brothers; they saw that: "As the planets and stars are moving, they must have sounds and tones. And as their level in its system is reserved for the image of perfection, there must be separate movements and their voices connected, and their sections moderate, and their tones are wonderful, and the words of praise and reverence and praise and rejoice by the souls of listeners to them"... It turns out that the movements of the planets and planets and tones ... because those movements and the components that are between them become It is then a measure of time and arms and a simulator of the astronomical movements of people".

#### **4.3 Medical Effect of Music Science**

The influence of the theories of Pythagoras in Al Kindi has been clear in the interpretation of the relationship between music and medicine. It has been transmitted from him by many Muslim scholars, including Al-Farabi and Avicenna. They adopted the theory in which Pythagoras says: Sweet sound and correct tunes moves through the body and clears the blood and the soul and relax the heart and perception and makes the movements comfortable".

Al Kindi made the tones and beats recipes for the body organs He not only explained in theory but applied in practice as a method of medical treatment. Perhaps one of the most important beliefs of Al Kindi in the treatment of music, is the emphasis on the melodies and rhythms and usefulness to the body members and that the melodies affect the body, for example, help digestion, and cleans the stomach Chemos Which is what he said in his saying: "Zir tones are suitable for the rhythm of the makhouri [light heavy second], and they strengthen Gallbladder and treat phlegm. Al Kindi also believes that the tones of the third string in the oud if played on a rhythm suitable for the first and second strings can help the blood and ease melancholia.

Aviccena, Al-Safa brothers and Al-Kindi participated in their views on the applications in melody treatment. Aviccena considered the pulse to be of a musical nature and a rhythmic proportion in speed and tension. He advised those with mental or psychological illness to listen to the songs. He pointed out that: " good singing, especially during sleeping and concern is a strong painkiller".

The Safa brothers referred to several applications they had in the medical treatment of music; they mentioned that they used a melody for the hospital in "the dawn to ease the pain and heal many diseases".

Al-Safa brothers emphasized their belief in the treatment of music by saying: "If the tones are composed in the melodies, and those tunes were used in the day and night to counteract the nature of the common diseases and the common misfortunes. Their effects have overcome their antagonisms as people know, such as in wars and adversities".

The sharp warm sounds warm the mood and soften the large kemos. The cool sounds dampen the mood of the hot, dry kimos. The moderate voices between the sharp and the heavy preserve the temperament of the moderate kimos mixture on its condition so as not to break out of moderation, and the huge and disproportionate voices that come on the ears in one surprise, spoil the mood, get out of moderation, and the sudden death".

#### **4.4 Musical Implementation on Psychology**

Music can be regarded as one of the best psychological and organic stimulants, which has become known throughout history. Al-Kindi's tune arrangement was based on the character of man and his feelings in his work entitled "A Message in the Arrangement of the Melody of High Characterization and the Similarity of Composition". Al-Kindi has also adapted melodies suitable for each age group. As well as the special seasons of the Year.

Al-Kindi sees that every time of the day has a special sound (rhythm, melody or tune) that suits it. The first and second heavy rhythms are suitable for the early morning, and the rhythms of the front and back are suitable for the middle of the day. The night is suitable for the rhythms, such as the tremors, the sand, and the light.

He believes that the number of tendons in musical instruments was placed in the light of the effect of melodies in the same person; tunes and rhythms have an effective role in changing the human nature when listening to them. Al-Kindi, therefore, resorted to psychological therapy in three ways. The third is by addressing the mind.

Al-Kindi has classified the melodies based on his idea of psychological therapy with music. He divided them into three sections:

1. Cheerful tunes, They create a sense of joy. Their rhythms are in the palms, the sand, the light, the first and the second.
2. Bold prehistoric melodies: these melodies give the souls boldness, despair. Their rhythms are what we balance.
3. Sad tunes: These tunes create sadness and crying as well as sleep in the soul.

In an attempt to explain the phenomenon of some of the Sufi sheikhs of their religious rites. The tunes have become a means of divine attraction. Al-Safa's brothers explain that in the music of laughter and good voices, it inspires courage and activates.

#### **4.5 The Effect of Music on Animals**

Al-Kindi elaborated on the effect of music on living creatures saying: "The philosophers have made many instruments suited to the formation of animal bodies". Ibn Haitham shared his views; he wrote on the effect of musical melodies in the souls of animals.

From the observations of Al-Kindi this area that the dolphin and the crocodile were if they heard the sound of the trumpet and go out of the sea and float to the boat as well as noted that the horses and deer are happy to hear the sounds of tendons, as the peacocks spread their wings and mumble when hearing the melodies as a sign of joy. And dance horses in harmony on the rhythm, as well as birds behave as they like the sounds of compassion and stand silent. The example of the birds' stand shows the sounds of the melody of David (peace be upon him).

The effect of melodies and tunes was monitored for all animals that have a sense of hearing, such as the use of trusses (singing songs for camels) for camels; they respond to melody and singing and they are active and relaxed and urge to walk with heavy loads, and may be overloaded by modernists in the prolongation of the shoes because the camels continue to go non-stop and fatigue and collapse and fall dead.

#### **4.6 The Effect of Music on Poetry**

The linguist Khalil bin Ahmed al-Farahidi, who died in 175 AH / 791 AD, was the first to develop the science of poetry (the balance of poetry), the first dictionary in the Arabic language called "Al-Ain", and the authors of the two books of music, "melody" and "rhythm". The number of patterns made by Farahidi is eight.

Ibn Sina did not exaggerate the characteristics and nature of poetry; it is a word of rhythms that are equal and repetitive to their weight and similar to the letters of the end. He also has several functions for poetry.

Farmer described the nature of the work performed by the balances in the Arabic poetry melody music. "Music is a difficult art that only the strong in a league can reach with good reason, intelligence, and good voice, but this art is not only about singing and singing. It is composed of songs and arranged in a strange arrangement balanced with a house of poetry or the equivalent of the words of encouragement"

## Conclusions

The Muslim philosophers and scholars possess an encyclopedic knowledge; they were an important factor in their connection to the following: First: their comprehensive view of science. Second: extracting the accurate information they have provided about the science of music. Third: Building the musical theory, which led them to collect the following:

1. Statement of the relationship between music and other sciences.
2. Focusing on the importance of music science as a science capable of developing the perception of human, in expanding the philosophical horizon, and the maturation of his mathematical mind.
3. Explaining the effect of music on living organisms, and what can be used in this area, as in the sciences of medicine, psychology, animals and plants.
4. Laying the foundations of the Arab musical theory, casting it with the mathematical theory (Pythagoras theorem), as did Al-Kindi, Al-Farabi and Avicenna .
5. Laying the rules of tunes and rhythms on the poetry, which was done by Al-Farahidi, Al Kindi, and Avicenna.

## References

1. Ibn Abi Useibia (d. 668 A. H./1296 A. D) Uein Al Anbaa fi Tabaqat Al Atibaa. Ridha, Nizar (ed.) Beirut: Dar Al Fikr (1965).
2. Avicenna (d. 428 A.H./ 1073 A.D.) Kitab Al Shifaa. Yousif, Zakaria (ed.) Cairo: Amiria Press.( 1956)
3. Ibn Khalgan (d. 681 A.H/1282 A.D) Wafiat Al Aian. Al Tawil & Qasim (ed.) Beirut: Alamia Press. (1998)
4. Ibn Zela (d. 440 A.H./ 1048 A.D.) Al Kafi fi Al Mosiqa. Yousif, Zakaria (ed.) Baghdad. (1964)
5. Al Safa Brothers. The Messages of Al Safa Brothers. Beirut: Arabia press (1957).
6. Al Beihaqi (d. 565 A.H./ 1169 A.D.) The History of Arab Scholars. Mohammed Kard (ed.) Paris: Billson (2007).
7. Al-Farabi, Abu Nasr Mohammed bin Mohammed bin Tarqan (339 AH / 950 AD): The Great Book of Music Ghattas Abdul Malik Khashba and his (eds.) Mahmoud Ahmad Al-Hafni, Dar Al-Kateb Al-Arabi for Printing and Publishing Cairo without the edition number.
8. Al-Kafti, Abulhassan Jamal al-Din Ali bin Yusuf (d. 646 AH / 1248 AD): News of the Scholars by the News of the Wise, the investigation of Abdul Majeed Diab Al-Khanji Foundation, Ibn Qutaiba Library, Egypt, Kuwait, Muthanna Library, Baghdad.
9. Al-Kindi, Abu Yusuf Ya`qub ibn Ishaq (255AH/868 AD): Stringed Stem Cells, Investigation by Zakaria Youssef, Publishing House Baghdad, 1962.
10. Nadeem, Abi al-Faraj Muhammad ibn Abi Ya`qub Ishaq (d 380 AH / 990 CE): Al-Fuhrest, the investigation of Yusuf Ali al-Tawil, Dar al-Kitab al-Slami, Beirut 3rd edition,
11. Al-Yaqoubi Ibn Waheed Ahmad ibn Ishaq ibn Ja`far ibn Wahab (d. 292 AH / 904 CE): The History of Yacoubi, Commentary and Notes by Khalil Al-Mansour, Dar al-Kuttub al-Alami, Beirut, first edition, 1419 AH / 1999.
12. Ahwani, Ahmed Fouad. Al-Kindi, Egypt Press, Place of Publication, None Edition No., None Year Printed.