UNIVERSITY OF CALIFORNIA AT DAVIS

NEOPLATONISM AND MUSICAL STRUCTURE IN THE ʿABBĀSID CALIPHATE, BAGHDAD 750 – 1000 CE

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> "Let us now enumerate and classify the types of genera and the alterations that affect every one of them. In order to enumerate and classify them, we shall use the mode that is called putting down before the sight."
>
> - from Abū Naṣr al-Fārābī's *Kitab al-Mūsīqá al-Kabīr (Grand Book of Music)*

INTRODUCTION

What did medieval Arabic music sound like? Accustomed to accessing score transcriptions from Western medieval music in the university library or online at the Petrucci Music Library website, in the Fall of 2017 I visited both, searching for an Arabic piece to play on my viola da gamba. I could not find a single example at either. I combed the internet, but found nothing that could be traced to a scholarly source. My interest was piqued, and I expanded my library searches, looking for titles of interest. I have not learned to read Arabic; however, with English, Spanish, and rudimentary French, I began to accumulate a handful of literary resources.

There is another facet to my interest in medieval Arabic culture: I am drawn to philosophy, and find truth in Aristotle's assertion that contemplation is the source of greatest happiness. In my courses in medieval Western music history, and early Western music notation I learned that the providence of some Latin translations of Greek philosophy can be traced to Arabic scholars. Some of these translations were later studied by Renaissance humanist associations, leading to striking changes in Western music. As I began to frequent the shelves in the philosophy section of the library, I learned of the classical scholarship supported by Baghdad's medieval ʿAbbāsid caliphate, its reverence for Aristotle as the "first teacher," and the successive generations of classically informed music theorists.

The results of my research show that ʿAbbāsid music theorists projected the theoretical abstractions represented by Pythagorean mathematical ratios of the monochord onto the practical plane of the ʿūd's fingerboard, producing instructions that allow musicians to apply those ratios

to fret or finger placements, and reproduce them in practice. Unrestrained by Greek tuning tables, they added additional divisions from observations of their contemporaries' repertoire, or withheld those of which they did not approve. Although interpretations of the theorists' melodic modes can be musicalogically controversial, the musical rhythms captured in al-Fārābī's documentation reveals a well articulated and easily learned solmization system, elaborated with techniques for variation. The musically trained philosophers of the ʿAbbāsid caliphate expounded and joined the science of music with its observation and practice by developing their own systems for lute tuning, relative pitch notation, and rhythmic solmization.

The fact that philosophical discourse was sponsored, and indeed thrived, in a theocratic polity challenged my assumptions about Islamic society, especially considering the medieval Christian church's history of censoring Greco-Roman philosophy from their educational curriculum. The medieval church tended to view Aristotelian logic as a challenge to faith in God's omnipotence. As a result, the rising Christian church in medieval Rome removed any branch of philosophy that it deemed a threat; however, the full curriculum of Aristotle's logic continued to be studied in Alexandria, and from there the tradition was transferred to Antioch, and later Baghdad.[1] Indeed, medieval Baghdad was a cosmopolitan cultural center whose elites supported scholarship and practice in the arts and sciences, believing that reason and logic could only bolster their understanding of creation and the universe. Scholars, merchants and performers represented the diverse cultures, religions, and ethnic backgrounds of the Middle East and beyond. The caliphate built a "House of Wisdom" in Baghdad to house the library and support scholarship. Its scholars were prolific writers and commentators who made lasting contributions to many branches of science and art; yet, our Western curriculum largely ignores their work and

1 Majid Fakhry, *Al-Fārābi: Founder of Islamic Neoplatonism: His Life, Works and Influence*. (Oxford: Oneworld, 2002), 11.

concentrates on their Greek predecessors and the Europeans who built on their knowledge centuries later during the Renaissance.

FOUNDATIONS OF NEOPLATONIC PHILOSOPHY IN MEDIEVAL BAGHDAD

Of the vast collections of manuscripts that were housed in the ancient and medieval libraries, relatively few remain; however, what survives is still extensive and important. Some reveal fundamental concepts that still apply to ethics, society and science. Others remain curiosities, describing disproved theories or beliefs now rejected as superstition. In this context, medieval music theory is unique, it is both science and art. Like mathematics and science, we can work through the calculations and reproduce the results of their applications. Perhaps we can access a window to the foundations to our own musical preferences and experiences. If we are fortunate, something lost can be recovered and recreated.

The notion of transferring knowledge with the written word is a concept rooted in classicism. In the Arab empire we find a literary culture inspired by the ancient Greeks taking shape. The empire supported Neoplatonic and Aristotelian scholars, desiring to philosophically bolster Islam, with the side effect that it fostered important advances in music theory, preceding European theorists by centuries. Yet, considering the ages of warfare and conquest that come with each new empire, each destroying and building in its wake, it is almost a miracle that should have knowledge of the ancients at all. Yet we can read the words, at least in approximation, of ancient philosophers, poets, and scholars that would have more easily faded into obscurity than survived. So it is to their credit that, historically, some imperial courts have taken interest preserving the achievements of former empires, and building upon them, even if their initial efforts of their generals were occupied in razing them.

In the West, our intellectualism is largely based on the advances brought to light in the Renaissance thanks to educated monks and clerics who had preserved Latin as a written language for centuries. Yet, the church of the preceding Middle Ages had repressed the reading of Latin classics as the works of "Pagan" writers. Historian Henry Thomas Buckle comments on the state of intellectualism in medieval Europe saying, "from the sixth to the tenth centuries there were not in all Europe more than three or four men who dared to think for themselves...the few who were able to read, confined their studies to works which encouraged and strengthened their superstition, such as the legends of the saints and the homilies of the Fathers."[2] While, Henry George Farmer spent much of this efforts as a musicologist attempting to prove the debt western music and lexicon owes to the Arab influence, we are still largely unaware of the vast commentaries and contributions made historically by Arab intellectuals. By the end of the ninth century, intellectuals in the Arab Empire were creating transcriptions and commentaries on classical texts. As generations of teachers and students passed, they conceptualized more original and complex works in philosophy and music.

Although operating within the military theocracy of the caliphates, a respect for plurality and intellectualism generally prevailed, allowing assimilation of classical ideals with the patronage of the religious state. While some medieval caliphs maintained strict ideologies against music, most valued the pleasures of intellectual discourse, music, and poetry, and rewarded skillful practitioners handsomely. The fostering of knowledge, arts, and diversity in the caliphate court translated into broad appreciation in civil society. With over one hundred bookstores, Baghdād's intellectual and artistic culture thrived under the ʿAbbāsid dynasty, which began in 135 AH / 750 CE.[3] The fifth caliph, Hārūn al-Rashīd (d. 193 AH / 809 CE) began collecting

2 Henry George Farmer, *Historical Facts for the Arabian Musical Influence*, (London: Hinrichsen, n.d.), 43.
3 George Dimitri Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 2nd

classical Greek manuscripts through military campaigns, while his successor, Ibrāhāim ibn al-Mahdī (d. 224 AH / 839 CE) dispersed emissaries to acquire Geek manuscripts through purchase and diplomatic negotiation. With the establishment of the Bayt al-Ḥikmah (House of Wisdom) by al-Mahdī in 214 AH / 830 CE, the caliphate was entering its intellectual golden age.[4]

While steeped in intellectualism and the arts, Baghdad was also cosmopolitan and multicultural, with scholars, artists, and poets of many colors, ethnicities, and religious creeds. In what musicologist George Sawa calls the "period of translation," between 132 AH / 750 CE and 236 AH / 850 CE, Greek, Persian, and Indian manuscripts were translated into Arabic on subjects that included mathematics, physics, astronomy, anatomy, medicine, philosophy, ethics, etiquette, history, stagecraft, and music. Arab scholars were diligent in their consideration and commentary on the recorded knowledge they had amassed. Ibn al-Haythem, most well known for his seven-volume treatise on optics, also recalculated and critiqued Ptolemy's solar theory, finding that it lacked a valid proof for a cosmically central Earth.[5] In all fields of literature, philosophers and theorists expanded beyond translations and commentaries on classical works, and developed their own ideas and theories. During the ninth and tenth centuries, much of their original output centered around Islamic philosophy and the Neoplatonic tradition; however, many of these philosophers were also prolific and articulate music theorists.

Neoplatonism was cultivated within Islamic culture by scholars who, like the classical philosophers they emulated, considered music a fundamental field of the sciences. Medieval ʿAbbasīd philosophers developed theories rooted in rationalism, continuing Aristotelian and Neoplatonic traditions. While the western Roman Empire had converted to Christianity and

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Ed. (Ottawa: Institute of Mediaeval Music, 2004), 5.

4 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 6.

5 Sheila Rabin, "Nicolaus Copernicus," *The Stanford Encyclopedia of Philosophy* (Fall 2015 Edition), ed. Edward N. Zalta. Accessed 27 April 2018, (PDF page) 7.

averted its attention away from classical texts because of their authors' pagan origins, the ʿAbbasīd's were beginning to collect them. Although a military campaign of caliph Umar ibn al-Khaṭṭāb led to the destruction of the Alexandria's great library in 638 CE,[6] for the next three centuries Islamic philosophers and caliphs became major stewards and collectors of classical texts. In Islamic education centers, such as Bayt al-Ḥikmah in Baghdad, Arabic scholars translated Persian translations from classical Greek and Indian manuscripts.[7] A host of medieval Islamic scholars and philosophers, including Al-Fārabī, Ibn Sīna, and Ibn Rusd, wrote commentaries on classical texts, and integrated their ideas into their own philosophies. To this effect, Al-Fārabī borrows a metaphor from Aristotle to introduce several of his treatises on music, that of "putting down before the eye,"[8] describing the writer's transmission of abstract knowledge to a reader in the form of a text – a concept we can easily take for granted today. The texts of Al-Fārabī and his successors reveal philosophers whose domain in the classical sciences allowed them to view the world methodically and rationally, despite the confines of theocratic rule. With Aristotle, Ptolemy, and Pythagoras leading the way, Islamic philosophers adopted an approach to metaphysics that supported observation, mathematics, and reasoning as primary vehicles for understanding the universe. Like the Greeks of antiquity, they exercised increasingly methodological approaches to understanding and describing their environment, the cosmos, and music. This subtle integration of science and theology allowed both to coexist and thrive.

6 Godfrey Oswald, *Library World Records*, 3rd ed. (Jefferson: McFarland, 2017), 25.
7 Oswald, *Library World Records*, 90.
8 George Dimitri Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE: Annotated Translations and Commentaries*. (Ottawa: Institute of Mediaeval Music, 2009), 259-260.

EARLY AND MOST INFLUENTIAL MUSIC THEORISTS OF THE ʿABBĀSID ERA

As practitioners of the Neoplatonic and Aristotelian traditions, Islamic philosopher-theorists were accustomed to advancing logical systems while navigating the restrictions and pitfalls of theocracy. These two worlds are somewhat analogous to the dichotomy between theory and practice. The most adept music theorists of their time were also adept in progressive analysis and commentary, and avoided embroilment in theological questions. They employed mathematical models derived from classical knowledge and scientific observation to generate tonal systems that went beyond the theoretical divisions of a monochord by accompanying their theoretical tone scales with designs for lute fretting and fingering on the open fingerboard. Their conceptions of music in time produced detailed rhythmic modes, or īqāʿāt, for use as frameworks for tonal melodies. They managed to transcended the abstract by connecting theory with practice and natural observation.

The ancient Pythagoreans, and some medieval neo-Pythagorean music theorists, believed that vibrations of a monochord were tangible, tactile manifestations of cosmic motion, and understood pitch frequencies as emanations from planetary bodies. Although al-Kindī used music in his medical practice, believing that both music and astrology affected physiological and psychological functions, the principle theorists, of the middle ages, like al-Fārābī and later ibn-Sīnā, were also practicing musicians, and rooted musical phenomena in acoustics and aesthetics. Medieval Arabic music theory is populated with prolific writers, too many to reference here; however, there are a handful that stand out, with accessible biographies and credits in English translation. The earliest of these music theorists was born just twenty-five years after the start of the ʿAbbāsid dynasty, Isḥāq al-Mawṣilī.

Isḥāq al-Mawṣilī (150-235 AH / 767-850 CE)

Isḥāq al-Mawṣilī was of Persian descent, the son of the famous composer and singer Ibrāhīm al-Mawṣilī, and studied *ʿūd* with his uncle, Zalzal (d. after 227 AH / 842 CE). The foremost court musician of his day, he seems to have been a *nadīm*, or "boon-companion," somewhat like a courtier, providing education, entertainment, and companionship to important members of the court.[9] He was educated in Qurʾanic sciences, Islamic lay, history, and the arts. Unfortunately, his music treatise, the *Kitāb al-Nagḫam wa al-Īqāʿ* (*Book on the Notes and Melodic and Rhythmic Modes*) does not survive. We only know some of its contents through the accounts of his student, Yaḥyà ibn al-Munajjim, and the philosopher Abū Naṣr al-Fārābī. While musicologist Owen Wright describes al-Mawsilī as a revitalizer of the Arabic modal system which was previously established by the singers of the preceding Umayyad era, George Dimitri Sawa contends that al-Mawsilī actively worked to purge foreign notes from the modal system and repertoire, a project which his father seems to have initiated.[10] This led him to be the first in the Arab empire to methodically define and document the genres of melodic and rhythmic modes which were influential in the rhythmic treatises of al-Kindi and still in use a century later when al-Fārābī used them in his own treatise.[11]

Al-Kindī (185-259 AH / 801-873 CE)

Abū Yūsuf Yaʿqūb ibn Isḥāq al-Kindī (var. Alkindus, in Latin), is considered the first Muslim philosopher. He is also unique among the Aristotelian and Neoplatonic philosophers of the Baghdad caliphate in that he was of Arabic decent. He considered Pythagorean mathematics

9 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 29.
10 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 74; and Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE,* 30.
11 Henry George Farmer, *A History of Arabian Music to the XIIIth Century*. (London: Luzac, 1994), 105.

as the basis of science.[12] In the field of music, he distinguished *musīqī,* a theoretical concern and mathematical science, from *ghinā*, the practice of music. His philosophy of music had broad ranging implications, from its relation to cosmic phenomena, natural elements, and seasons, to its connection with bodily humors, organs, and both emotional and physical health.[13] As a physician, Al-Kindī used music as a medical treatment, sometimes combining it with therapies involving colors and scents.[14] Al-Kindī wrote hundreds of treatises, predominantly in scientific and mathematical disciplines.[15] However, he is recognized more as a transmitter of Greek knowledge than a developer of the new.[16]

Al-Kindi's music treatises are the earliest extant works in Arabic that demonstrate a strong influence from the ancient Greeks, and his descriptions of mensural music were centuries before such discussions are found in European texts.[17] From approximately fifteen music treatises, only five are known to survive, including the *Kitāb al-nagham* (*Book of Notes*) and the *Kitāb al-īqāʿ* (*Book of Rhythm*), and those which translate to the *Book of Stringed Instruments*, and the *Epistle on Informative Sections on Music*.[18] In his surviving *Epistle,* al-Kindi defined rhythms as "durations of equal amount and similar proportions," and classified them using the *chronos protos* conceptualized by Aristoxenus; however, he excluded the Greek rhythmic modes in the *Epistle* explaining that, "the musicians of our era most often follow the established tradition when using the īqāʿāt in order to seek the approval of their audience, [and in so doing] leave out the more proper and necessary arrangement that was customary among the earlier

12 Philip K. Hiti, *History of the Arabs: From the Earliest Times to the Present*, 10th ed. (Basingstoke: Palgrave Macmillan, 2002), ch. 27.
13 Fadlou Shehadi, *Philosophies of Music in Medieval Islam*. (Leiden: E. J. Brill, 1995), 15.
14 Shehadi, *Philosophies of Music in Medieval Islam*, 29-32.
15 Peter Adamson, "Al-Kindi," *The Stanford Encyclopedia of Philosophy* Summer 2018.
16 Wright, Owen. "Al-Kindī's braid," *Bulletin of SOAS* 69, no. 1 (2006), 1.
17 Hiti, *History of the Arabs: From the Earliest Times to the Present*, ch. 27.
18 Farmer, *A History of Arabian Music to the XIIIth Century*, 105.

Greek philosophers." These efforts to document contemporary musical practice demonstrate al-Kindī's pragmatism, complimentary to his transmission of classical knowledge.

IBN AL-MUNAJJIM (241-300 AH / 855-912 CE)

Yaḥyà Ibn al-Munajjim al-Nadīm was a student of al-Mawṣilī, and wrote the *Risālah fi al-Mūsīqá* (*Epistle of Music*), the only known surviving manuscript that preserves the melodic modes from al-Iṣbahānī's *Kitāb al-Aghānī.*[19] Although al-Munajjim's writing can lead to ambiguous conclusions, as we will see in the section discussing his modes, Wright describes it as "the only extant document to contain an an appreciable amount of information about the modal structure of Arabian art music in the eighth and ninth centuries,"[20] so that in providing detailed descriptions of modal practice, we are more than compensated for his logical contradictions.

Like his teacher al-Mawṣilī, Al-Munajjim was a musical purist, and omitted foreign elements introduced into the Arabic tonal system from his modes, such as the Persian notes added by the singers ʿAllūyah (d. 236/850) and Muk̲ẖāriq (d. ca. 232/846), and seconds and thirds added by the al-Mawṣilī's uncle, Zalzal – which will be introduced later in al-Fārābī's modes. He also omitted the pre-Islamic, indigenous Arabic tonal system that still flourished in folk music during his time, including that of the Baghdād *ṭunbūr*, a stringed instrument of the narrow range of only 720 cents, not much more than a fifth, utilizing a completely different tonal system than the *ʿūd*, although we do not receive details on the tuning intervals from any of the theorists.[21]

19 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 74.
20 Owen Wright, "Ibn Al-Munajjim and the Early Arabian Modes." *The Galpin Society Journal* 19 (1966): 27.
21 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 74, 83.

AL-FĀRĀBĪ (CA. 259-339 AH / 872-950 CE)

Abū Naṣr Muḥammad ibn Muḥammad ibn Ṭarḵẖān ibn Awzalagẖ al-Fārābī (var. Alpharabius) is known to this day in Persian and Arabic cultures as the "Second" teacher, while Aristotle is known as the First. He was born at Waṣīj in the Fārāb district of Transoxiana, estimated 258 AH / 873 CE, and died in Damascus at nearly eighty years old. He studied in Bagẖdad, philosophy under Yuḥannā ibn Ḥaylān, and grammar under Ibn al-Sarrāj.[22] Al-Fārābī left Bagẖdād for al-Shām in 330 AH / 941-2 CE, and moved on to Damascus the following year before winning the patronage of Sayf al-Dawlah in Aleppo and settling there.[23]

Al-Fārābī was the most important medieval Arabic music theorists because he was not only an articulate and methodical philosopher, he was also a learned and talented musician. The basis of his education and philosophy was in the ancient Greek, and he emulated the circumspect style of Aristotle's reasoning. He wrote on subjects including logic, philosophy, ethics, politics, metaphysics, grammar, mathematics, music, alchemy, and astronomy. Al-Fārābī was an innovator in the field of logic and in music theory, building on Aristotle's works.[24] Sawa comments as follows on the broad reach of Aristotle's influence,

> His discussion on the philosophy of music relied heavily on Aristotle's *Posterior Analytics*; that on the use of music for the attainment of happiness relied on political philosophy. He used complicated arithmetic calculations such as the addition and subtraction of fractions to figure out musical intervals, and drew very interesting analogies between rhythm in music on the one hand and grammar and prosody on the other.[25]

This underscores the fact that Al-Fārābī's musical philosophy was richly intertwined with implications drawn from a wide range of human concerns. Like al-Kindi, he classified music as a

22 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 12-14.
23 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 14.
24 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 17.
25 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 14.

field of mathematics, and therefore subject to equal rigors of analysis, but with the practical observations and considerations that only a musician could provide. His extant music treatises provide us with detailed information about the rhythmic modes of his time, but unfortunately al-Fārābī was less meticulous regarding the structure of melodic modes.[26]

His music treatises include the *Kitāb al-Mūsīqá al-Kabīr* (*Grand Book of Music*) in two volumes, of which only the first is known to survive, the *Kitāb al-Īqāʿāt* (*Book of Rhythms*), and the *Kitāb Iḥṣāʾ al-Īqāʿāt* (*Book of for the Enumeration, Classification and Basic Comprehension of Rhythms*).

Book One of the the *Kitāb al-Mūsīqá al-Kabīr* is groundbreaking for its time because is was intended as a manual for musicians and performers to "verify theory by practice." An overview of the contents of Book One give an idea of al-Fārābī's methodical approach to supplying a broad range musical considerations while constrained to practical context:

Section I, *Fī al-Madk̲h̲al ilà Ṣināʿat al-Mūsīqá* (*Introduction to the Art of Music*) is a treatise on the philosophy of music.

Section II, *Al-Ṣināʿah Nafsuhā* (The Art Itself) contains three subdivisions, or "Arts".

Art I, *Fī Usṭuqisāt al-Mūsīqá*, (*Elements of the Art*), influenced by ancient Greek treatises of Aristoxenus (*Elementa Rhythmica*), Quintilianus (*De Musica*), Euclid (*Postulatum*), and Aristotle (*Posterior Analytics, Physics, Metaphysics,* and *De Anima*), as well as the works of Ishāq al-Mawṣilī and al-Kindī.[27] Here he describes

26 Farmer, *A History of Arabian Music to the XIIIth Century,* 149.
27 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE,* 122.

acoustics, musical intervals, tetrachords, melodic modes and rhythms.

Art II is *Fī al-Ālāt al-Masḫhūrah* (*Common Musical Instruments*) and related the theory of the first part to actual instruments, giving instructions to attain the necessary tones, and describing the ranges and capabilities of each instrument. The instruments discussed are ʿūd (lute), ṭunbūr (pandore), mizmār (flute or reed pipe), surnāy (oboe), rabābah (rebec), and miʿzafah (zither?).

Art III is *Al-Alḥān al-Juz'iyyah* (*Composition*) in two discourses. The first includes tables of consonances and dissonances, melodic movement, rhythms and variation techniques for both vocal and instrumental music. The second on vocal music, performance practice and the goals of music.[28]

The *Kitāb al-Īqāʿāt* (*Book of Rhythms*), is a treatise on rhythmic modes, or īqāʿāt (plural for īqāʿ) with a theoretical focus. This book is somewhat overshadowed by Al-Fārābī's third and most refined treatise on music, the *Kitāb Iḥṣāʾ al-Īqāʿāt* (*Book of for the Enumeration, Classification and Basic Comprehension of Rhythms*). In this treatise, intended to be read by musicians and used in practice, he has developed a new system of rhythmic notation that reiterates and renames the types of percussive attacks (ie. light and heavy types) and adds a system of metric division accounting for duration separating attacks.[29] Sawa summarizes al-Fārābī's integration of time and rhythm within the īqāʿ:

The īqā is the motion through musical sounds that are similar and consecutive to the

28 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 1.
29 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 317-8.

> hearing sense within consecutive and equal time periods. Each consecutive and equal time period in the īqāʿ is called a cycle. Therefore one may summarize the definition [of the īqāʿ as] the succession in time of equal cycles.[30]

With the integration of time units and īqāʿ, al-Fārābī had developed a system similar to our concept of mensural music in modern Western music notation, as a modular unit of rhythm arranged in time.

AL-IṢBAHĀNĪ (284-356 AH / 897-967 CE)

Abu al-Faraj al-Iṣbahānī (var. al-Iṣfahānī) was born in Isfahan and died in Baghdad at the age of seventy. He was a descendant of the last Umayyad caliph, and from the Quraysh tribe, to which the Prophet Muḥammad also belonged. He spent most of his life in Baghdad and was educated in philology, grammar, Ḥadīth, Qurʾanic sciences, history, genealogy, and biographies. In addition, he was educated for a role as nadīm (boon-companion), which included falconry, medicine, astrology, preparation of beverages, and music.

Al-Iṣbahānī focused on the practice of performance and its role in society. His *Kitāb al-Aghānī,* (*Book of Songs*), in twenty-four volumes, is considered "a 10,000 page ethnographic document," with Isḥāq al-Mawṣilī appearing as narrator and figure in numerous anecdotes.[31] One of these describes a rift between factions of musicians, the "Romanticists," who , depending on the point of view, were either innovating or corrupting the old Arabic repertoire with Persian and other foreign embellishments. The romantics included the family of Ḥamdūn ibn Ismā'īl, his teacher Mukhāriq, the students of Ziryab, and the slave-singers of Shāriyya and Raiq, and the "Classisists" faction included "Uraib and her circle of singing girls, Al-Qāsim ibn Zurzūr and his

30 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE,* 324-5.

31 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE,* 29; and Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD,* XV.

family, the circle of Badhl the songstress, the minstrels of the Barmakid family, and the progeny of Hāshim, Yaḥyā ibn Mu'ād, and Al-Rabīʿ."[32] While al-Iṣbahānī did not make theoretical or philosophical contributions per se, his work is an important resource for musicologists interested in ʿAbbasīd musical culture and practice.

Al-Iṣbahānī also documents the long standing tradition of heterophony in Middle and Near Eastern music, describing that "everyone 'played as one,' meaning that an ensemble followed the melody together, with the exception of *zā'ida* or "gloss," which is the use of various ornaments.[33] Farmer points out that this practice of musical harmony conforms with the Greek αρμονία (*armonia*, or harmony), which results from the "ordered succession of intervals,[34] a practice that continues in Arabic classical music performances today.

RHYTHM AND TONALITY OF THE EARLY ʿABBĀSID THEORISTS

MUSICAL NOTATION

Musicologists Henry George Farmer and Kathleen Schlesinger argued over the origins of European musical notation, Schlesinger asserting that Europe's notation had been inspired by the Greeks via the work of Boëthius. Farmer argues, with support from Gevaert and Lussy, that the Greek and Boëthian notation lacked fixed values related to pitch intervals, such that writing the notes A and B would not correspond to a fixed interval between them. Guideo of Arezzo, perhaps to his own aggrandizement, says that, "the book of Boëthius is useless for singers, and is intended merely for philosophers."[35] In any case, musical notation, both rhythmic and melodic, was used in the caliphate courts for musicians' use, not to transmit the music itself, but rather for

32 Farmer, *A History of Arabian Music to the XIIIth Century,* 148.
33 Farmer, *A History of Arabian Music to the XIIIth Century,* 72.
34 See footnote 1in Farmer, *A History of Arabian Music to the XIIIth Century,* 73.
35 Farmer, *Historical Facts for the Arabian Musical Influence,* 87.

musical education as lute exercises and modal scales[36], since the music was considered an improvisatory art.

Few examples of medieval Arabic notation survive. The earliest from the ʿAbbāsid period are from al-Kindī in his ninth-century *Risāla fi khubr taʾlīf al-alḥān*. He devised the following diatonic octave scale,[37]

al-Kindī Diatonic Notation

Arabic	ا	ج	د	و	ح	ط	ك	ا
Transliteration	A	J	D	W	Ḥ	Ṭ	K	A
Western	A	B	C	D	E	F	G	A'

and the following chromatic octave scale:[38]

al-Kindī Chromatic Notation

Arabic	ا	ب	ج	د	ه	و	ز	ح	ط	ي	ك	ل
Transliteration	A	B	J	D	H	W	Z	Ḥ	Ṭ	Y	K	L
Western	A	Bb	B	C	C#	D	Eb	E	F	F#	G	Ab

While al-Kindī's theories were largely based on the Pythagorean *musica universalis*, or music of the spheres, his octave scale notation is early innovation in Arabic music notation.

36 Farmer, *Historical Facts for the Arabian Musical Influence,* 88-92.

37 Notation transliteration and western note values from Owen Wright, "Al-Kindī's braid," *Bulletin of SOAS* 69, no. 1 (2006), 4. These Arabic note letters are deduced from the transliteration and converted using the transliteration guide in Habib Hassan Touma, *The Music of the Arabs*. Translated by Laurie Schwartz. (Portland: Amadeus, 1996), xi.

38 Notation transliteration and western note values from Farmer, *Historical Facts for the Arabian Musical Influence,* 88-89. These Arabic note letters are deduced from the transliteration and converted using the transliteration guide in Habib Hassan Touma, *The Music of the Arabs*. Translated by Laurie Schwartz. (Portland: Amadeus, 1996), xi.

ĪQĀʿĀT - OR RHYTHMIC MODES

There are basically nine rhythmic modes, which Al-Fārābī attributes to al-Mawṣilī and al-Kindi, described in Al-Fārābī's *Kitab al-Īqāʿāt* or *The Book of Rhythms*[39]. In the commentary on al-Mawṣilī, referred to as Isḥāq, he explains that differences between the "*nameless*", *al-khafīf* and *al-hazaj* modes, which on the surface appear equivalent, as in the transcriptions to modern Western notation below;[40] however, each notehead represents a percussive attack combined with the duration of rest before the next attack. The same convention is used in the īqāʿāt tables that are presented later.

nameless ♪ ♪ ♪ ♪ ♪ ♪...

al-khafīf (light) $\frac{3}{8}$ ♪ ♪ ♪...

al-hazaj $\frac{6}{8}$ ♪ ♪ ♪ ♪ ♪ ♪...

These are rhythmic modes of "equidistant attacks,"[41] with the differences between the "*nameless*", the *al-khafīf*, and the *al-hazaj* in their tempi. The *nameless* could be considered the fastest, although it is not actually performed. It is the theoretical origin of all rhythms, comparable to the Aristoxenian *chronos protos*[42], an unexpressive framework consisting of the primary units of any īqāʿāt. The *al-khafīf* and *al-hazaj* are consecutively slower. Al-Fārābī attempts to elucidate this, offering an example of the *al-hazaj* mode in reference to a poem by the name of, "Pass the cup [of wine] around us;" however, he adds that, while the metric of

39 The following summary from Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 7.

40 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 41; and Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE: Annotated Translations and Commentaries*. (Ottawa: Institute of Mediaeval Music, 2009), 7.

41 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 38.

42 Chronos protos is the "primary time" in Aristoxenus' theory of rhythmopœia, the smallest indivisible unit: C.F. Abdy Williams, *The Aristoxenian Theory of Musical Rhythm*. (Cambridge; University Press, 1911), 28; and Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 110.

framework of *al-hazaj* remains steady, the attacks can be varied by using the "dropping out" technique,[43] which will be shown using examples from al-Fārābī's *Kitāb al-Īqāʿāt.* The Examples demonstrate that each īqāʿ categories can be varied through procedures that include filling in separated attacks, dropping out attacks, doubling attacks, and juxtaposing or combining variations. Other alterations not reflected in the examples include varying the intensity of attacks. Other techniques, such as "joining," which alters the duration of the cycle, and the "desire" or "scent," which may have added repeated syllables into the cycle.[44] We are able to discuss these rhythmic modes in detail only because Al-Fārābī employed a system of rhythmic solmization.

Rhythmic Solmization of Īqāʿāt

Al-Fārābī's system of *rasm,* or rhythmic solmization, was a necessity for putting rhythms "down before the sight," a system that borrowed from the Anonymous Bellermann treatises from fifth- and sixth-century Byzantium.[45] The syllables, *ta*, *tan*, *na*, and *nan* imitate the sound of the attacks and the temporal spaces between them. Shorter durations between attacks are represented by syllables with open vowels, *ta* and *na;* longer durations are represented by *tan* and *nan*,

allowing the syllable to be stretched. For example, *ta na nan* ♪♪♩, and *tan nan ta na nan* ♩♩♪♪♩ An additional symbol, zero (0) is used for notating variations with dropped out attacks. Al-Fārābī also included versions of these īqāʿ categories and variations in his other treatises, some are translated and transcribed by Sawa. Unfortunately, Al-Fārābī did not seem to reference any

43 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 411-412.
44 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 284.
45 "Putting down before the sight," is a term al-Fārābī borrows from Aristotle's Rhetoric. Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 259-260.

generalized but universal durational terms, such as the pace of a walk, or a heartbeat. Instead, tempi are described only in relative terms, ie. "light" being faster than "heavy."

From each classification if īqāʿ there is an origin, the most basic form. For example, the origin of the *al-khafīf*, or light is *ta nan.∴ta nan*, with the triple dot representing a separator for the cycles. In addition to the basic form, or "origin" of īqāʿāt, and simple variations, there are more complex variations involving joining, disjoining and juxtoposition that are not included here.[46] Suffice it to say that each mode can be rearranged as an improvised performance proceeds. The tables below are examples reconstructing the īqāʿ within the "nameless" tempus, from al-Fārābī's *Kitāb al-Īqāʿāt*, and as interpreted by Sawa:[47]

The Light Category Īqāʿāt

Al-Khalfif (Light) Category Īqāʿ – Origin of the First Light (two 3/8 cycles)						
tempus	♪	♪	♪	| ♪	♪	♪
īqāʿ	ta	nan		| ta	nan	

Al-Khalfif (Light) Category Īqāʿ – Variation of First Light: Dropping Out Second Attack						
tempus	♪	♪	♪	| ♪	♪	♪
īqāʿ	tan	0		| tan	0	

Al-Khalfif (Light) Category Īqāʿ – Origin of the Second Light (two 4/8 cycles)								
tempus	♪	♪	♪	♪	| ♪	♪	♪	♪
īqāʿ	ta	na	nan		| ta	na	nan	

Al-Khalfif (Light) Category Īqāʿ – Variation of Second Light: Dropping Out Second Attack								
tempus	♪	♪	♪	♪	| ♪	♪	♪	♪
īqāʿ	tan	0	nan		| ta	0	nan	

46 Tables adapted from Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 263-300.
47 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 263.

Following this variation of the Second Light, al-Fārābī notes that the use of dropped out cycles should be varied, some cycles using the dropping out variation and some not.

Al-Khalfif (Light) Category Īqāʿ – Origin of the Third Light (two 5/8 cycles)										
tempus	♪	♪	♪	♪	♪	| ♪	♪	♪	♪	♪
īqāʿ	ta	na	na	nan		| ta	na	na	nan	

Al-Khalfif (Light) Category Īqāʿ – Variation of Third Light: Dropping Out Second Attack										
tempus	♪	♪	♪	♪	♪	| ♪	♪	♪	♪	♪
īqāʿ	tan	0	ta	nan		| tan	0	ta	nan	

Al-Khalfif (Light) Category Īqāʿ – Variation of Third Light: Dropping Out Third Attack										
tempus	♪	♪	♪	♪	♪	| ♪	♪	♪	♪	♪
īqāʿ	ta	nan	0	tan		| ta	nan	0	tan	

The Al-Hazaj Category Īqāʿāt

Al-Hazaj Category Īqāʿ – Origin of the Hazaj (two 6/8 cycles)												
temp.	♪	♪	♪	♪	♪	♪	|♪	♪	♪	♪	♪	♪
īqāʿ	ta	na	ta	na	nan		| ta	na	ta	na	nan	

Al-Hazaj Category Īqāʿ – Variation of the Hazaj: Dropping out Second Attack												
temp.	♪	♪	♪	♪	♪	♪	|♪	♪	♪	♪	♪	♪
īqāʿ	tan	0	ta	na	nan		| tan	0	ta	na	nan	

Al-Hazaj Category Īqāʿ – Variation of the Hazaj: Dropping out Fourth Attack												
temp.	♪	♪	♪	♪	♪	♪	|♪	♪	♪	♪	♪	♪
īqāʿ	ta	na	nan	0	tan		| ta	na	nan	0	tan	

Al-Hazaj Category Īqāʿ – Variation of the Hazaj: Dropping out Second and Fourth Attacks												
temp.	♪	♪	♪	♪	♪	♪	|♪	♪	♪	♪	♪	♪
īqāʿ	tan	0	tan	0	tan		| tan	0	tan	0	tan	

Al-Muḍāriʿ Īqāʿ

Al-Muḍāriʿ Category Īqāʿ – Origin of the Muḍāriʿ (two 7/8 cycles)														
temp	♪	♪	♪	♪	♪	♪	♪	|♪	♪	♪	♪	♪	♪	♪
īqāʿ	ta	na	na	ta	na	nan		| ta	na	na	ta	na	nan	

Similar to the Light and Hazaj īqāʿ, variations can be used dropping out the third, fourth, second and fourth, second and fifth, and the third and fifth attacks.

The Heavy Category Īqāʿāt

Al-Ramal (Heavy) Category Īqāʿ – Origin of the Ramal (two 3/2 cycles)												
temp.	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥
īqāʿ	tann		tann		∴		tann		tann		∴	

Al-Ramal (Heavy) Category Īqāʿ – Variation with Doubling												
temp.	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	| 𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥
īqāʿ	tan	tan	tan	tan	tan	tan	| tan	tan	tan	tan	tan	tan

Al-Ramal (Heavy) Category Īqāʿ – Variation with Doubling and Dropping Out Second Attack from One Cycle												
temp.	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	| 𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥	𝅗𝅥
īqāʿ	tan	tan	tan	tan	tan	tan	| tan	tann	0	tan	tan	tan

Variations on the al-Ramal include dropping out the second attack from the first cycle (but only one cycle), dropping out the fourth from both cycles, the fourth from one cycle, the fifth from both or one cycle, the second and fifth from both cycles, the third from both cycles, and the second and sixth attacks from both cycles.[48]

The First Heavy Category Īqāʿ – Origin of the First Heavy (two 4/2 cycles)								
tempus	𝅗𝅥 𝅗𝅥	𝅗𝅥 𝅗𝅥	𝅗𝅥 𝅗𝅥	𝅗𝅥 𝅗𝅥	| 𝅗𝅥 𝅗𝅥	𝅗𝅥 𝅗𝅥	𝅗𝅥 𝅗𝅥	𝅗𝅥 𝅗𝅥
īqāʿ	tann	tann	tann	∴	| tann	tann	tann	∴

48 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 277-281.

The First Heavy Category Īqāʿ – Variation Doubling the Second Attack								
tempus	♩ ♩	♩ ♩	♩ ♩	♩ ♩	| ♩ ♩	♩ ♩	♩ ♩	♩ ♩
īqāʿ	tann	tan tan	tann	∴	| tann	tan tan	tann	∴

The First Heavy Category Īqāʿ – Variation Doubling the Second and Fourth Attacks								
tempus	♩ ♩	♩ ♩	♩ ♩	♩ ♩	| ♩ ♩	♩ ♩	♩ ♩	♩ ♩
īqāʿ	tann	tan tan	tann	tan tan	| tann	tan tan	tann	tan tan

The First Heavy Category Īqāʿ – Variation Doubling the Third Attack								
tempus	♩ ♩	♩ ♩	♩ ♩	♩ ♩	| ♩ ♩	♩ ♩	♩ ♩	♩ ♩
īqāʿ	tann	tann	tan tan	tann	| tann	tann	tan tan	tann

Additional variations include doubling the first attack only, and doubling all four attacks. Al-Fārābī also notes that these variations can be juxtaposed with cycle(s) of other variations of the First Heavy.[49]

The Second Heavy Category Īqāʿ – Origin of the Second Heavy (two 5/2 cycles)										
tempus	♩ ♩	♩ ♩	♩ ♩	♩ ♩	♩ ♩	| ♩ ♩	♩ ♩	♩ ♩	♩ ♩	♩ ♩
īqāʿ	tann	tann	tann	tann	∴	| tann	tann	tann	tann	∴

The Second Heavy Category Īqāʿ – Variation Adding Support at the Separator										
tempus	♩ ♩	♩ ♩	♩ ♩	♩ ♩	♩ ♩	| ♩ ♩	♩ ♩	♩ ♩	♩ ♩	♩ ♩
īqāʿ	tann	tann	tann	tann	tann	| tann	tann	tann	tann	tann

Here, Al-Fārābī has added "support," filling in the separator in the large separator between cycles. He also notes that this īqāʿ, with its long cycles and durations can be varied with faster tempos and dropping out attacks. In practice, the Second Heavy can be performed fast and with so much dropping out that "some people think that it is lighter than the first heavy."[50] It can also be used with doubling, so that each cycle has ten attacks.[51]

49 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 284.
50 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 288.
51 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 290.

The Second Heavy Category Īqāʿ – Variation Dropping out Third Attack										
tempus	♩ ♩	♩ ♩	♩ ♩	♩ ♩	♩ ♩	| ♩ ♩	♩ ♩	♩ ♩	♩ ♩	♩ ♩
īqāʿ	tann	tann	0	tann	tann	| tann	tann	0	tann	tann

The Second Heavy Category Īqāʿ – Variation with Juxtoposition										
tempus	♩ ♩	♩ ♩	♩ ♩	♩ ♩	♩ ♩	| ♩ ♩	♩ ♩	♩ ♩	♩ ♩	♩ ♩
īqāʿ	tann	tann	0	tann	0	| tann	tann	tann	0	tann

The Medium Category Īqāʿāt

The Light Ramal Category Īqāʿ – Origin of the Light Ramal (two 3/4 cycles)						
tempus	♩	♩	♩	| ♩	♩	♩
īqāʿ	tan	tann	..	| tan	tann	..

The Light Ramal Category Īqāʿ – Variation with Attack of Passage						
tempus	♩	♩	♩	| ♩	♩	♩
īqāʿ	tan	tan	tan	| tan	tan	tan

Al-Fārābī notes that, with the removal of the small separator, this variation is similar to the doubled variation of the Ramal.[52]

The Light Ramal Category Īqāʿ – Variation with Dropping out Second Attack						
tempus	♩	♩	♩	| ♩	♩	♩
īqāʿ	tann	0	tan	| tann	0	tan

The Light Ramal can also be varied with juxtopositions.

The First Light Heavy Category Īqāʿ – Origin of the First Light Heavy (two 4/4 cycles)								
tempus	♩	♩	♩	♩	| ♩	♩	♩	♩
īqāʿ	tan	tan	tann	..	| tan	tan	tan	tan

The First Light Heavy Category Īqāʿ – Variation with Attack of Passage								
tempus	♩	♩	♩	♩	| ♩	♩	♩	♩
īqāʿ	tan	tan	tan	tan	| tan	tan	tann	..

52 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 292.

The First Light Heavy Category Īqāʿ – Variation with Dropping out the Second Attack of the First Cycle								
tempus	♩	♩	♩	♩	| ♩	♩	♩	♩
īqāʿ	tann	0	tann	..	| tan	tan	tann	..

The First Light Heavy Category Īqāʿ – Variation with Attack of Support and Dropping out the Second Attack of the Second Cycle								
tempus	♩	♩	♩	♩	| ♩	♩	♩	♩
īqāʿ	tan	tan	tann	..	| tann	0	tan	tan

The First Light Heavy Category Īqāʿ – Variation dropping out the Attack of Passage and the Third Attack from the First Cycle								
tempus	♩	♩	♩	♩	| ♩	♩	♩	♩
īqāʿ	tan	tann	0	..	| tan	tan	tan	tan

In the First Light Heavy, Al-Fārābī specifies that doubling is not used. An additional variation is the dropping out of the third attack in both cycles.[53]

The Second Light Heavy Category Īqāʿ – Origin of the Second Light Heavy (two 5/4 cycles)										
tempus	♩	♩	♩	♩	♩	| ♩	♩	♩	♩	♩
īqāʿ	tan	tan	tan	tann	..	tan	tan	tan	tann	..

Variations on the Second Light Heavy include filling in the small separators with attacks of passage and support, dropping out the third attack, dropping out the third attack with attacks of passage and support, and dropping out the second and fourth attacks and using the attacks of passage and support.[54]

53 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*,, 297.
54 Sawa, *Rhythmic Theories and Practices in Arabic Writings to 339 AH/950 CE*, 298-300.

JAMĀʿAH, MAQĀMĀT – OR MELODIC MODES

In contemporary Arabic music, the melodic mode has been described as the "raw material" that enables the musician to create "emotional climates."[55] If we take this to mean, musical character can be transferred to the listener, then we might think this is a somewhat classical way of connecting music to emotion. Taken further, a Pythagorean may argue that abstract music produces emotions, giving ephemeral music the power to affect bodies through its vibrations, even asserting that, as cosmic matter and the Earth itself are physically moved by the frequencies of the perceivable cosmos, we are are also astrologically moved and influenced. It would follow that the smaller but relative ratios of musical frequencies could sway an individual's spirit, if not their physical body. But, while there were neo-Pythagoreans, such as al-Kindī, in the medieval Arab sphere, many of the next generation of Arabic theorists took a more Aristotelian approach, rejecting Ptolemy's link between the "heavenly music" of the spherical cosmic motions and the vibrations of musical pitch. Aristoxenus, who concentrated on music as a sensory phenomena,[56] and Aristotle, with his emphasis on natural observation and rational inquiry, were strongly influential for al-Fārābī, who treated music both as a mathematical science, and a natural phenomenon that *effects* pleasure and entertainment, as opposed to *affecting* human character and emotion. Ibn Sīnā's eleventh-century introduction to the *Kitāb al-Shifāʾ* takes a firm position, placing music apart from both mathematical abstraction and metaphysical conjecture,

> It is time for us to conclude the mathematical branch of philosophy and set forth a compendium of the science of music, limiting ourselves to what is essential to it and part of its conception, and what follows from its principles and elements. We shall not stretch our discussion with numerical and arithmetical principles and

55 A. J. Racy, *Making Music in the Arab World: the Culture and Artistry of Ṭarab*. (Cambridge: Cambridge University Press, 2003), 97.

56 Shehadi, *Philosophies of Music in Medieval Islam*, 68.

> corollaries, for these one may seek from the science of arithmetic. We shall also ignore the similarities between the heavenly bodies and human character traits and the ratios of musical intervals. This is the way of those for whom the sciences have not been distinguished the one from the other, and it has not become clear to them what is essential and what is accidental. [57]

As Aristotle expressed methodically in his second book of Rhetoric, emotion is a response to action, and it must have an object for its direction. Music is neither. It can only fan a fire that already exists. In their high esteem for Aristotle, the principal philosophers and music theorists, ibn-Sīnā and al-Fārārbī, adopted more naturalistic approaches to music and its study. They concentrated on the function of sound on life in the human and animal world, the acoustic properties of musical sound, and aesthetics.[58]

Modes may be considered, not as producers of human emotions or affectations, but rather as tools for musical practitioners to produce the aesthetic climate to nurture a specific emotional state. However, there is only a thin separation here from the practice of music for entertainment and meditation, and the medical-therapeutic practice employed by al-Kindī. The evidence that comes down to us in their literature shows that medieval Arabic melodic modes and tunings utilized the whole number ratios of the Pythagorean *Tetraktys,* both for the aesthetics and their mathematical placement as harmonic ratios of the perfect octave, fifth, fourth, and second intervals. Beyond these fundamental intervals, the octave was further divided according to what was appreciated in practice aesthetically, by allowing one of several stylistic *wusṭā* third intervals for flavor, and a selection of microtonal ornaments above the *sabbābah* major second for spice. For those who define modes in terms of affective quality, their collection of intervals are designed to connect and enter into physiological and psychological processes, and thereby intervene in their course.

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57 Shehadi, *Philosophies of Music in Medieval Islam*, 66.
58 Shehadi, *Philosophies of Music in Medieval Islam*, 28 & 66.

Al-Kindī's Sympathetic Modes

Al-Kindī's modal framework was based on a four-string *ʿūd* tuned in fifths,[59] each string endowed with physiological and psychological connections that could be used for medical therapy. The first string, *al-zīr* worked in sympathy with the heart and organs, with effects on rationality, courage and aggression, al-*mathnā*, the second string, with the liver, to encourage intellectual function, joy, fairness, and love. *Al-mathlath*, the third string, is said to work in sympathy with the brain to promote memory, virtue, gentleness and fearfulness, and used to induce calm and regulate phlegm. The fourth, *al-bamm*, is associated with the testicles and connects to patience, gravity, and friendliness, and used to induce joy and affection.[60]

ʿŪd String	Physiological Connections	Psychological Connections	Therapeutic uses
C - al-zīr	heart, organs, bile; heat, dryness	rationality, courage, aggression	strengthens joyous, assertive traits, promotes sleep
G - al-mathnā	liver; heat, humidity	intellectual function, joy, fairness, love	strengthens joyous, generous traits, and dispels melancholy
D - al-mathlath	brain, phlegm; cold, wet	memory, virtue, fearfulness, gentleness	induce fearfulness and calm, regulate phlegm and bile
A – al-bamm	testicles; cold dry	patience, gravity, friendliness	induce joy, affection, strengthen black bile, cool blood
As a therapeutic approach, mixing strings produces mixed effects			

Since al-Kindī was not a musician, he had to procure lutenists to perform the prescribed modes in the presence of his patients, in order to administer his musical treatments.

Al-Munajjim's ʿŪd Tuning and Mode System

Unlike al-Kindi, al-Munajjim was a practicing musician. His mode system is based on musical practice, as opposed to al-Kindi's theoretical metaphysics. Al-Munajjim's *Risālah fī al-Mūsīqī* provides the only extant documentation of his teacher Isḥāq's mode system.[61] While many musicians of his time certainly used additional microtonal intervals, al-Munajjim's treatise

59 Owen Wright describes "notional" five-string lute tuning system in his article, "Al-Kindī's braid." He elaborates on a series of possible modal progressions, which were described by al-Kindi in vague terminology. Because of their complexity and speculative nature, they are not reproduced in this survey.

60 Shehadi, *Philosophies of Music in Medieval Islam,* 30.

61 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932,* 74.

excluded both contemporary innovations such as the Persian and Zalzal thirds, and traditional pre-Islamic Arabian tones.[62]

Although al-Munajjim was not a meticulous theorist, and he intentionally abridged the modes used in practice, he documented a framework for his idealized modal structure. Reproduced below, as translated by Wright, the following instructions are provided in al-Munajjim's *Risālah fi al-Mūsīqá*. Note that his teacher, Isḥāq al-Mawṣilī is referenced simply by his first name.

(1) According to Isḥāq there are only ten notes, viz.: f g a♭ a b♭ c' d♭' d' e♭' e' (e 𝄬 and e are used as well as e♭' and e').
(2) According to Isḥāq there are nine notes, the tenth note being the octave of the first. (These two contradictory statements are not juxtaposed in the text.)
(3) The modes are divided into two sets (*majrā*), one containing *a*♭ and the other *a*. These two notes are mutually exclusive, i.e. can- not both occur in any one mode.
(4) The notes *f g b*♭ *c' d' e*♭' are 'compatible', i.e. may all occur in a single mode. In conjunction with a they form the '*a* set' (*majrā al-binṣir*) .
(5) The notes at *a*♭ *a*; *d*𝄬, *e* are 'incompatible'. The rule of mutual exclusion applicable to a♭ and *a* (cf. statement 3) is also valid for the other pair, *d*𝄬' and *e.*
(6) *d*𝄬' is 'compatible' with *a*♭ in its course, except for one particular place where it does not agree with it: one cannot pass from *d*𝄬' to *d'*, nor from *d'* to *d*𝄬'.
(7) *e* is 'compatible' with *a* in its course, except for one particular place where it does not agree with it: one cannot pass from *e* to *e*♭, nor from *e*♭ to *e*; equally impossible are the movements *e* to *e*♭', *e*♭' to *e*, *e*♭' to *e'*, and *e'* to *e*♭'.
(8) The greatest number of notes upon which a composition may be based is eight out of the ten. This is a characteristic feature of Arabian music[63]

62 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 74.
63 Wright, "Ibn Al-Munajjim and the Early Arabian Modes," 28-29.

Summarizing Sawa's translation using solmization helps to clarify the "flavor" of Al-Munajjim's modal structure, and shows his elaboration of distinctively "major" and "minor" type modes with an allowance for a mixture to avoid melodic tritones, as follows: (1) and (2) There are ten notes {*do re me mi fa sol le la te ti*}. (3) A mode is either major, or minor, it cannot have both types of third. (4) A mode may consist of *do re fa sol la te. Le* and *ti* are incompatible. (5) *me* and *mi*; *le* and *ti* are not used in the same mode. (6) *le* is used in the minor scale, except where it produces a tritone: do not pass from *le* to *la,* or *la* to *le*. (7) *Ti* is used in the major mode except where it produces a tritone; do not pass from *ti* to *te*, nor from *te* to *ti*. (8) A composition will exclude two of the ten notes.

Al-Munajjim's 'A' Modes

A Mode	A	B	C	D	E	F (+F#)	G	A
	do	re	me	fa	so	le (+la)	te	do
Ab Mode	Ab	Bb	C	Db	Eb	F	G (-Gb)	Ab
	do	re	mi	fa	so	la	ti (-te)	do
						(alterations to prevent tritone)		

Compared to diatonic natural minor-, and major-scales with seven notes. It appears from al-Munajjim's instructions that the use of eight notes in a mode allows for the use of a major or minor sixth in the minor-third mode, or the major or minor seventh in the major mode, to prevent a tritone (from or to scale degree two in the minor mode, or from or to scale degree four in the major mode) – this assuming that the tritone is the "one particular place where it does not agree" with the mode. This also assumes also that al-Munajjim's ambiguity between points (1) and (2) can be interpreted to mean that a composition uses eight of the ten notes, not inclusive of the octave above the tonic. Otherwise, there would be no logic to his mention of movement between *le* and *la* in (6) and *te* and *ti* in (7), in the context of avoiding "one particular place where it does

not agree." However, the generally accepted interpretation of al-Munajjim's modes seems to use ten notes inclusive of the octave, which fails to address the alternative sixth- and seventh-scale degree when working around a tritone.

These melodic mode interpretations, collated by Sawa and from musicologists Farmer, Shawqī, Wright, Sachs and Collangettes (some with competing interpretations of al-Munajjim's text), all take ten notes inclusive of the octave, are reproduced in the table below.[64]

Al-Munajjim's Melodic Modes from Sawa								
Mode 1	C	D	E	F	G	A	B	C'
Mode 2	D	E	F	G	A	B	C'	D'
Mode 3	E	F	G	A	B	C'	D'	E'
Mode 4	F	G	A	B	C'	D'	E'	F
Mode 5	G	A	B	C'	D'	E'	F'	G'
Mode 6	A	B	C'	D'	E'	F'	G'	A'
Mode 7	B	C'	D'	E'	F'	G'	A'	B'
Farmer's 8th Melodic Mode of Al-Munajjim, from Sawa								
Mode 8	C	D	Eb	F	G	A	B	C'

Compiling modern musicologists' interpretations of al-Munajjim's modes, we find a collection with similarities to the medieval European church modes. An additional "conjectural" Mode 8 from Farmer that is also reproduced in Sawa provides the tonality of a minor third with the major sixth scale degree and leading tone seventh:[65] If those are considered strictly as shown, there would be only one variety of sixth-scale degree used in any one mode, but then why would al-Munajjim reiterate movement between major- and minor-sixths? Or, are we to assume that *musica ficta* would be administered as necessary to avoid "disagreement" between notes in these eight modes, as is believed to have been the practice in Medieval Europe? The instructions are

64 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 76-77.
65 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 77.

admittedly vague; yet, the most accepted solutions seem surprisingly parallel to Western church modes, giving them the scent of Eurocentrism. Farmer has a reputation for zeal for proving the Arabic influence on European music and linguistics. Perhaps a reevaluation of al-Munajjim's modes with more flexibility around the sixth and seventh scale degrees is warranted.

Another potentially controversial area that requires conjecture is the exact pitch structure of al-Munajjim's lute tuning. The ambiguity of al-Mawṣilī's *ʿūd* tuning pitch structure requires musicologists to use educated assumptions to interpret his intent because Al-Munajjim does not fully define the tunings and intervals with ratios. Instead, he provides the letter names of the notes on the frets, similar to a modern guitar tuning diagram which gives notes names for the open strings and frets. Wright and Farmer have used a number of assumptions to interpret tuning ratios and interval values. Wright describes his deductive process in this paper, "Ibn Al-Munajjim and the Early Arabian Modes," Note that Wright refers to al-Munajjim by his first name Yaḥyā.

> Rather surprisingly, Yaḥyā fails to supply any definition of tunings and intervals. However, there is a passage in which he explains that the notes on the two lower strings may be disregarded because the two upper strings produce the same notes at the octave. To illustrate this he appends a list of octave and unison identifications which can be schematized as follows, giving each new note, irrespective of position, the next letter in alphabetical order:[66]

	STRINGS			
	bamm	*mathlath*	*mathnā*	*zīr*
Open string (*muṭlaq*)	p	s	w	r′
1st finger (*sabbāba*)	q	t	p′	s′
3rd finger (*binṣir*)		v	q′	t′
4th finger (*khinṣir*)	s[a]	w	r′	u′
				v′

Wright interprets the pitch interval using the following deductions, and resulting the in tuning table reproduced below, (the same tunings also used in Sawa's[67] work). Note that Wright has

66 Wright, "Ibn Al-Munajjim and the Early Arabian Modes," 27-28.
67 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 75.

converted intervallic ratios to *cents*, (the unit based on an equally tempered semitone of 100 cents, and 1200 cents to an octave – from the system devised by Alexander Ellis in the nineteenth century) which allows comparison with intervals we are accustomed to hearing from a conventionally tuned piano.

> Assuming strings tuned a perfect fourth apart, the resulting scale is a simple Pythagorean one consisting of whole-tones and limmas, since if p-s and s-w are fourths, w-p' is a whole-tone; similarly (subtracting q-t and t-p' from q-q'), p'-q' is a whole-tone, as is also (r-u and u-x from r-r') x-r'. The notes are here given together with their cents values in relation to the lowest note (an arbitrary) G:[68]

bamm	*mathlath*	*mathnā*	*zīr*
G (0)	*c* (498)	*f* (996)	*b♭* (294)
A (204)	*d* (702)	*g* (1200=0)	*c′* (498)
B♭ (294)	*e♭* (792)	*a♭* (90)	*d♭′* (588)
	e (906)	*a* (204)	*d′* (702)
c (498)	*f* (996)	*b♭* (294)	*e♭′* (792)
			e′ (906)

Wright's interpretation of al-Munajjim's *ʿūd* tuning[69]

Given al-Munajjim's intent to abridge musical practice in his text, and the discord between musicologists' interpretations of this truncated tonal system, it is worth considering that medieval theorists, such as al-Munajjim, were not only cognizant of the rationally derived Greek tone systems, but that they sought to establish these sonorities in musical practice, bolstering Wright's interpretation. Perhaps al-Munajjim was fully cognizant of the rationally derived Greek tone systems, but did not document them. Or, could ʿAbbāsid musicians have derived Pythagorean intervals from natural observations of the harmonic overtone series in their practice as musicians? Although these questions are left unanswered by al-Munajjim, al-Fārābī would soon make it clear that he had access to the musical ratios documented by Aristoxenus.

68 Wright, "Ibn Al-Munajjim and the Early Arabian Modes," 28-29.
69 Wright, "Ibn Al-Munajjim and the Early Arabian Modes," 28-29.

Al-Fārābī's ʿŪd Tuning and Mode System

Further to al-Munajjim's lute fret intervals, al-Fārābī expanded on al-Munajjim's ʿūd tuning system by adding a fifth string to create a two octave span within the frets system. He also positioned additional frets to derive Persian and Zalzal intervals. His tetrachord is framed by ratios found in ancient Greek tunings, placing the tone at a ratio of 9/8 or 204 cents, and the perfect fourth at a ratio of 4/3 or 498 cents, coinciding with ratios consistently recurring in Greek octave divisions (see Greek tuning tables in Appendix). Indeed, in the *Kitab al-musiqá al-kabir*, al-Fārābī provided a detailed account of ancient Greek tone systems; however, while he believed that the Greek systems were "more perfect," and advocated their adoption by ʿAbbāsid musicians, he noted that they were generally unknown and disused in practice.

Within the tetrachord framework, al-Fārābī added a series of microtonal divisions, designating five microtonal divisions between the open string and the major second, and three alternative Persian and Zalzal thirds. He retained al-Munajjim's convention of naming the frets according to its assigned finger placement, including the *al-sabbāhah* (index finger), *al-wusṭa* (middle finger), *al-binṣir* (ring finger) and *al-khinṣir* (little finger). The thirds are located at the *wusṭa al-Furs* (Persian middle finger), and two separate *wusṭa Zalzal*. Al-Fārābī also renamed al-Munajjim's minor third (9/8 + 256/243) to *mujannab al-wusṭa*. The divisions below the major second, the *mujannab-al-sabbāhah* or "anterior to the index finger" frets, are listed below with descriptions in Arabic transliteration, and English translation in parenthesis. Each is derived through some kind of deduction, dividing or subtracting from other intervals, for example the equal division between a third and the open string, or a limma[70] which in Pythagorean theory is two whole tones (9/8 + 9/8) subtracted from a perfect fourth (4/3).

70 From Greek *λεῖμμα* (*leimma)*, or 'remainder.'André Barbera, "Limma," *Grove Music Online*.

a. *Mujannab al-sabbābah bi-tankīs dhī al-maddatayn* (anterior to index finger, two tones from the little finger fret) – 90 cents, the semitone interval of Ptolemy's Diatonic Ditonal tuning derived from the ratio 256/243, which has come to be known as a Pythagorean semitone[71] (see tuning tables in Appendix).

b. *mujannab al-sabbābah bi-tanṣīf al-ṭanīnī al-awwal* (anterior to index finger, half-tone) – halfway between the open string and the *sabbābah* index finger – at 98 cents from the open string it is nearly an equal-intonation semitone.[72]

c. *mujannab al-sabbābah bi-baqiyyah* (anterior to index finger by a limma) – at 114 cents, it creates the apotome of the open string, corresponding with the difference between the whole tone at 204 cents and the 90-cent semitone. This is another interval present in Pythagorean tuning, also called a chromatic semitone.

d. *mujannab al-sabbābah bi-wusṭà al-Furs* (Persian anterior to index finger) – at 145 cents, and placed halfway between the open string and wusṭà al-Furs (the Persian middle finger).

e. *mujannab al-sabbābah bi-wusṭà al-Zalzal* (Zalzal's anterior to index finger) – at 168 cents, and placed halfway between the open string and *wusṭà al-Zalzal* (the first of the Zalzal middle finger frets).

These frets are not all included in any one mode. Also important to note is that the group of *Majannabāt al-sabbābah* frets between the *sabbābah* index finger and the open string are

71 Murray J. Barbour, *Tuning and Temperament: A Historical Survey.* (East Lansing: Michigan State College Press, 1951), 22.

72 Sawa does not list the ratio here. Forster provides the ratio of 18/17 for this half interval of Sabbābah: Cristiano M. L. Forster, *Musical Mathematics: On the Art and Science of Acoustic Instruments*. (San Francisco: Chronicle Books, 2010), §11.53.

rarely used in melodies, but are rather used for ornamentation[73] along with the corresponding *sabbābah* (Persian, Zalzal, or unamed Pythagorean) index finger fret. In summary, a tetrachord on a single string consists of the following:[74]

- the open *muṭlaq* string,
- the *sabbābah* index finger fret at a major second (9/8 or 204 cents),
- the *khinṣir* little finger fret at a perfect fourth (4/3 or 498 cents),

  plus one of the following options for the third:

  - a minor third at *majannab al-wusṭà* middle finger fret (32/27 or 294 cents), or
  - a Persian third at *wusṭà al-Furs* middle finger fret (25/21 or 302 cents), or
  - one of the two Zalzalian thirds at the *wusṭà Zalzal* middle finger fret (6/5 or 318 cents; ~119/97 or 354 cents), or
  - a major third at the *al-binṣir* ring finger fret (9/4 or 408 cents) .

According to Sawa, the *wusṭà* and *binṣir* thirds are mutually exclusive in al-Fārābī's mode system. Exluding the ornamental *Majannabāt al-sabbābah* divisions, this structure can be extended into four modes shown in the following table, reproduced from Sawa.[75]

Al-Fārābī's Melodic Modes from Sawa

Mode 1	G1	A1	B1b	C1	D1	E1b	F1	G2	
Mode 2	G1	A1	B1p	C1	D1	E1p	F1	G2	p=Persian
Mode 3	G1	A1	B1z	C1	D1	E1z	F1	G2	z=Zalzal
Mode 4	G1	A1	B1	C1	D1	E1	F1	G2	

73 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 81.
74 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 80.
75 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 81.

This basic octave structure from the open *muṭlaq* position, produces "major" and "minor" type modes that, aside from the uses of neutral Persian and Zalzal thirds, are rather similar to modern Western scales.

However, this major-minor octave framework can be greatly expanded considering al-Fārābī's notion of modes or *jamāʿah* of varying range. The smallest range is the *jamāʿah nāqiṣah* (incomplete group), that of one tetrachord plus a tone, five notes within a perfect fifth. The octave groups of seven distinct notes described above each form a *kāmilah bi-al-quwwah* (complete in potential). Finally, the double octave, or *kāmilah bi-iṭlāq* (complete in an absolute sense) creates a system of conjunct and disjunct tetrachords that allows different thirds within each octave group.

The *kāmilah bi-iṭlāq* has three basic arrangements of double octaves:

A) [tetrachord – tetrachord – tone] [tetrachord – tetrachord – tone]
B) [tetrachord – tone – tetrachord] [tetrachord – tone – tetrachord]
C) [tone – tetrachord – tetrachord] [tone – tetrachord – tetrachord]

Arrangements A and B are designated *jamʿ tāmm muttaṣil* (group complete conjunct), while C is jamʿ tāmm munfaṣil (group complete disjunct) because the initial major-second tone before the tetrachord in the second octave is considered disjunctive. When the two octaves have identical notes, the jamʿ is *ghayr mutaghayyir* or *mutashābih* (homogeneous); however, if one octave uses a Persian or Zalzal third and the other a major *binṣir* or a minor *majannab* third, it becomes *mutaghayyir* (heterogeneous). With these additional sonorities, a musician with a five-string lute using heterogeneous double octaves has a pitch vocabulary that reaches far beyond the previously conjectured modes that are comparable to major – minor tonality and Western church modes.

Sawa also mentions in passing al-Fārābī's indication that an octave may include two different tetrachords, but al-Fārābī only provides an example from ancient Greek music. Could this indicate an even greater expansion of his mode system? At any rate, the practice of mixing tetrachords is connected to an ornamentation technique called *al-takthīr*, meaning to increase or multiply.[76] Al-Fārābī writes at length regarding various ornamentation techniques, which will not be covered here. However, Sawa has provided translations and interpretations in his *Music Performance Practice in the Early 'Abbāsid Era*, which could provide a point of departure for a study focusing on ornamentation and perhaps more clear understanding of the sound of ʿAbbāsid music.

The *ʿūd* tuning tables provided in the appendix show fret calculations derived from both Sawa's tables (which provide cents intervals) and a 1967 edition of al-Fārābī's *Kitab al-musiqá al-kabir*, edited by ʿAbd al-Malik Khashabah Ghaṭṭās and revised by Egyptian musicologist Mahmūd Aḥmad al-Ḥifnī (var. Mahmoud El Hefny) which provides interval ratios. While the basic tetrachord structures align between these two versions, there are significant disagreements between positions of the *mujannab al-sabbābah* micro tonal frets. Sawa's version provides simple relationships between the Persian and Zalzal microtones by using the halfway point to their respective thirds, which is not apparent in the Ghaṭṭās edition's tuning chart (see chart and tables in Appendix). However, the origin of the discrepancies are not yet clear, and would require recreating the methods of their calculations and accessing their source manuscripts.

76 Sawa. *Music Performance Practice in the Early 'Abbāsid Era 132-320 AH / 750-932 AD*, 91.

CONCLUSION

Of the recent scholarship on medieval Arabic music, that of George Dimitri Sawa and Owen Wright is the most extensive and complex[77]. The object of their work cannot be assimilated in the course of constructing a brief survey such as this, even with their thorough interpretations and translations. It is also somewhat problematic in their reliance on Ellis' cents system to convey intervallic interpretations without reference to mathematical ratios which may, or may not be present in the primary source material. A thorough comparison would require enough facility with Arabic script and medieval numerals to validate their interpretations.

However, the mathematical ratios illustrated in the Ghaṭṭās edition of *al-Fārābī's Kitab al-Mūsīqī al-Kabīr* are within my grasp after learning to read Arabic numerals. I was also able to compare Sawa's and Wright's *ʿūd* tuning tables with ancient Greek tunings and reproduced them on the violin. I began by entering Greek and Arabic tuning tables from the work of George Sawa and J. Murray Barbour into spreadsheet software, an efficient way to calculate string lengths for theoretical fret placements that can quickly be modified to suit the string length of any unfretted instrument at hand. With violin, tuned in fourths like an *ʿūd*, one can mark frets on the fingerboard and create an approximation of the pitch vocabulary advocated by al-Munajjim and al-Fārābī. To experiment with al-Fārābī's modal system, a five string ʿūd capable of double octaves would allow full exploration of the two-octave *kāmilah bi-al-quwwah*, especially with an expanded understanding of ornamentation techniques used by musicians in medieval Baghdad.

A more thorough study of modal procedures would provide a more accurate framework for performance, especially with access to primary sources in Arabic. While the Middle East is currently mired in conflict, libraries like the Biblioteca Nacional de España and the Real

77 See their entries in the bibliography for their referenced works.

Biblioteca at the monastery of El Escorial, Spain have thousands of Arabic manuscripts in their collections, some of them digitized and available over the internet. In addition, a survey of current performance of traditional al-Andalus music in Spain and Morocco (since it should be safe for a novice, traveling academic such as myself) may reveal similarities with contemporary rhythms and pitch vocabularies used in improvisation. Further research combined with listening and observation could provide clues to remnants of medieval Arabic and Persian modes that were exported to Andalusia's Umayyad caliphate in the eighth and ninth centuries, which were later brought to Morocco by Andalusians fleeing the *Reconquista* in the late fifteenth century. Although I believe this paper provides sufficient resources to begin experimenting with historically informed improvisation related to ʿAbbāsid era music, further exploration and scholarship will expand the framework outlined here, and allow for a more complex and nuanced understanding and performance. In any case, a thoroughly researched collection of rhythmic modes, melodic scales and fret tunings will produce a wealth of material for experimentation and possibly improvisation, perhaps reproducing a facet of medieval ʿAbbāsid musical culture from its Golden Age.

However, this study should make it clear that the ʿAbbāsid Caliphate's investment in collections of Greek literature and support for philosophical development resulted in advancements in science and music theory. After a period of imitating Greco-Roman literature, ʿAbbāsid philosophers and music theorists advanced original ideas with a strong connection to rationalism and observation. The practical orientation of music treatises by al-Munajjim and al-Fārābī, contrast with the metaphysical orientation of their predecessor, al-Kindī, outlining a process that brought the metaphysical properties of Greek music theory to the material substrate of the ʿūd's fingerboard. Their applications of classical knowledge show progress towards

modern approaches to science, and were more than simply a bridge to the European Renaissance – they represent an earlier renaissance that was in full force in the midst of Europe's Middle Ages.