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# NEMO

Near-Eastern Musicology Online

GEUTHNER

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- ICONEA (*International Conference of Near-Eastern Archaeomusicology*) is a research group of The Institute of Musical Research, School of Advanced Study of the University of London, and specialises in Near and Middle-eastern archaeomusicology.
- CERMAA (*Centre de Recherches sur les Musiques Arabes et Apparentées*) is part of FOREDOFICO, the *Foundation for Research, Documentation and Field Collection for Oriental and Arabian Traditional and Folk Music and Arts*. Both promote Arts and Music in the Lebanon and are dedicated to researches in *maqām* music and modality.
- PLM (*Patrimoines et Langages Musicaux*) is a research group of the Université de la Sorbonne, Paris-IV and includes musicians, musicologists and music historians.

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## EDITORS' LETTER / ÉDITORIAL / كلمة الناشرين

"It is impossible to say with any certainty whether it was the Pythagorean, the Just Intonation, or even some other major third which was used in ancient India"

Nazir Jairazbhoy\*

### QUESTIONING MODALITY<sup>1</sup>

This first issue of NEMO is devoted to modality. Other volumes to follow will include Oriental as well as Occidental music whether early or contemporary, secular or religious, vocal and instrumental, acoustic as well as electronic. This first issue was limited to classical non-European modality, temporarily excluding researches into the polyphonic mediaeval West. However, it included European folk occurrences.

Various considerations constituted the basis for this call for papers. There was a matter of definition, to begin with Winnigton-Ingram's classical assumption which needed to be re-assessed:

"Mode is essentially a question of the internal relationships of notes within a scale, especially of the predominance of one of them over the others as a tonic, its predominance being established in any or all of a number of ways: e.g., frequent recurrence, its appearance in a prominent position as the first note or the last, the delaying of its expected occurrence by some kind of embellishment".<sup>2</sup>

More than often, perpetrators of this kind of definition, conveniently avoid mentioning the following citation of the Western concept of mode:

"The modern major scale is an instance of a mode".<sup>3</sup>

Here, all is said of a particular concept of modality that Jacques Chailley<sup>4</sup>, in his time, refuted on the basis of insufficient and implicit definitions of modality.

As early as 1971<sup>5</sup>, Trần Văn Khê had already attempted at expanding and refining the definition of the term while integrating his own "mother"-music within and despite of incompatibilities between the Vietnamese *điệu* and his own definition which turned out to be a sort of melting pot where any other form that the renowned musicologist considered as modal, was added to Western paradigms.<sup>6</sup>

\* [Jairazbhoy, 1975, p. 44].

<sup>1</sup> Note: The multilingualism in NEMO has led its editors into harmonising English and French typographical conventions whenever possible in the present volume. As a result the reader may be surprised at times by unusual typography, consequence of this harmonisation.

<sup>2</sup> [Winnigton-Ingram, 1936, p. 2].

<sup>3</sup> [*ibid.*].

<sup>4</sup> After having mentioned [Chailley, 1960, p. 5] the modal characteristics according to which the Occidental perception of mode resides in function of "1) The choice of an octave type as a fundamental unit, 2) The tonic note as the first of the octave type, 3) Of the hierarchy of the other pitches taken *harmonically* in relation to the tonic and the dominant, etc., 4) The functional identity of all sounds projected at an octave must remain in exact multiples of that pitch 5) Irrelevance to absolute pitch, span, octave used and melodic forms used", Chailley concludes that "The principle part of traditional aberrations come from a natural '*retropolisation*' which implies the retrospective application of the modern thought to concepts to which they are posterior. In the present case none of the defined characteristics that we have isolated belong *ab ovo* to what we generally call modes".

<sup>5</sup> See François Picard ([Picard, 2012]) in the present volume.

<sup>6</sup> This applies particularly to the modal concept of *ethos* which is still controversial in relation to its inadequacy to satisfy a definition of mode. Additionally, modal characteristics of *điệu* and *pathet* are still controversial as seen in [Powers et al., 2001, "Mode, §V: Middle East and Asia (ii) Pathet (a) South-east Asian modal systems"]; François Picard replicates this in his aforementioned paper.

These definitions lead to various thoughts. Two of them even questioning the very essence of modality<sup>7</sup> on the basis of a possible, if not of a probable parallel between modal construction and folk music, opposing the latter to art music<sup>8</sup>. Other questions were presented in response to the call for papers for this present issue. Indeed can one be content with a single definition of what mode is, notably for music spreading from the Ancient World to our times, within a geographical space spreading from Scotland and Brittany to Iran, India and Arabia? And if tonality and modality, are related in any manner, how are they? Does modality influence other forms of music and is modality influenced, in turn, by other forms of music, and how? What is the function of form in mode? Are *maqāmat* which are described as pentatonic or based on a pentatonic structure to be considered as modes? Can we say of constructions not responding to the octavial framework that they are modal, and the same applying to polychordal or even scalar constructions, and so forth? These questions reveal that the concept of modality, although widespread, needs comprehensive emendations well beyond the few questions and answers produced in the present volume and that many more volumes of the present series<sup>9</sup> will be required to cover researches that the term mode implies.

### *Contributions in the volume*<sup>10</sup>

To start with we shall introduce one of the Breton modality authorities, singer and former clarinet player **Erik Marchand**. He will explain how his principle of *entendement modal* resulted from his confrontation with modality and questions arising from this encounter. **François Picard**'s paper counterpoints Marchand's questionings. However, Picard expands the discourse starting from a general standpoint of modal definition and enters into pentatonic structures reminding the reader that the two forms may not be confused. The writer relates of his own experience gathered from his acquaintance with Trần Văn Khê and other experts of modality in France<sup>11</sup> and elsewhere to which he adds recent analyses undertaken with *Monika* and *Psautiers* softwares.

The second contribution in this field is by **Markos Skoulios** which relates of a peculiar understanding of modality, in general<sup>12</sup>, of the Byzantine material. To our knowledge, there is no comprehensive<sup>13</sup> work available in any Western language,<sup>14</sup> about the influences of the theory of Chrysanthos of Madytos and its subsequent "developments" by the Patriarchal Commission of 1881 in Constantinople<sup>15</sup>. This paper is therefore most welcome since it fills the gap of one of the most complex aspects of Oriental modality. It is particularly obvious that it is impossible to discuss Byzantine Chant without reference to Ottoman music. **Jacob Olley** comments on its evolution in conjunction to the *maqām Şabā* and its various commentators.<sup>16</sup>

**Rosy Azar Beyhom**'s article consists in reviewing Mikhā'il Mashāqa's methodology in his well-known treatise on Arabian music where she finds inherent complexities of descriptions, not that distant in time from us, and stresses on the deep contradiction between the modern aspiration of systemising modal descriptions and

<sup>7</sup> For example, [Powers, 1992a ; 1992b].

<sup>8</sup> See [Gelbart, 2007].

<sup>9</sup> Or other reviews and books, obviously.

<sup>10</sup> Each submission to NEMO is assessed by at least two members of the editorial board. Some papers dealing with more complex themes would be submitted to external expertise. It remains that opinions produced in any form in the present volume is the responsibility of their authors as well as the quality of the language in which the contribution is submitted, this applying particularly to the English language.

<sup>11</sup> The reader will probably be aware after reading the contributions of Erik Marchand and François Picard, of diverging perceptions of a same material which is formulated by the former while it is perceived by the latter. Both authors diverge radically in that the former considers variations in the size of intervals as an important component, even as an indispensable part of modality while the latter rejects any modal function in temperament or in differences in pitch sets and interval values.

<sup>12</sup> Enriched by a comparative process of the author in relation to Turkish music.

<sup>13</sup> And relatively concise.

<sup>14</sup> Or even, for example, in Arabic.

<sup>15</sup> And of their development up to our times.

<sup>16</sup> From Cantemir to Behar and Popescu-Judetza via Yekta Bey, Ezgi, Arel, Signell and Wright.

Mashāqa's deep rooted objection, although himself a modernist engaging in over-simplification of the values in the interval formulation of modes in Arabian music.

Within a more accurate view focusing on the peculiarities of Oriental modality, **Amine Beyhom** engages in solving two persistent enigmas in Arabian and Indian music. These are about the peculiar division of Shihāb-a-d-Dīn al-Ḥijāzī in 19<sup>th</sup> century Egypt of 28 quarters of the octave and about the Indian division of 22 *śrutis* in Bharata-muni's *Nāṭyaśāstra* and reminds scholars of one of the alternatives to interval equality concept conveyed by means of modern musicology.

The volume concludes by **Richard Dumbrill**'s achievements having researched for the past four decades, the oldest extant written cuneiform sources of theoretical music. These sources had been wrongfully ascribed to Ancient Greece for the past two and a half millennia. Dumbrill forcefully rejects the Occidental dogmatic propositions arising from normalising dictates which had been imposed by 19<sup>th</sup> century musicology.<sup>17</sup>

#### POST-SCRIPTUM

*The editors of NEMO-Online would like to acknowledge that a colloquium organised by the DROM group was held at Brest, Brittany, France from the 16<sup>th</sup> to the 18<sup>th</sup> of November 2011. The theme was: "Modality: a bridge between Occident and Orient".<sup>18</sup> This cultural gathering has, for the first time in history, congregated modality experts and a passionate audience around a theme that is seldom discussed as a popular musical expression in Europe and amounts to a contribution complementing ours in respect of contemporary theoretical and practical modality.*

<sup>17</sup> And not contested as critically observed on a daily basis of articles or other materials dealing with modality.

<sup>18</sup> See [Drom, 2012a ; 2012b ; 2011].

LA MODALITÉ EN QUESTION<sup>1</sup>

Le premier numéro de NEMO est consacré à la modalité ; ce ne sera pas le seul puisque ce thème englobe des musiques d'Orient comme d'Occident, anciennes ou contemporaines, religieuses ou profanes, instrumentales ou vocales, acoustiques tout comme électroniques. L'appel à contributions s'est limité, pour ce premier numéro, à la modalité extra-européenne classique, c'est-à-dire en excluant très momentanément du champ de recherche la modalité de l'Occident médiéval ou polyphonique, mais en y incluant les musiques traditionnelles européennes<sup>2</sup>.

Plusieurs questionnements avaient été à la base de cet appel à contributions ; la définition même du mode, en passant par celle, classique, de Winnington-Ingram, semble devoir être remise en cause :

« Mode is essentially a question of the internal relationships of notes within a scale, especially of the predominance of one of them over the others as a tonic, its predominance being established in any or all of a number of ways : e.g., frequent recurrence, its appearance in a prominent position as the first note or the last, the delaying of its expected occurrence by some kind of embellishment »<sup>3</sup>.

Bien sûr, les tenants de ce genre de définitions oublient parfois de citer la suite de ce passage, très révélateur de la notion de mode en Occident :

« The modern major scale is an instance of a mode »<sup>4</sup>.

Tout est dit d'une certaine conception de la modalité, celle-là même que dénonçait Jacques Chailley<sup>5</sup> en soulignant les insuffisances dans les définitions *implicites* de la modalité à son époque.

Trần Văn Khê, en 1971 déjà<sup>6</sup>, a essayé d'étendre et de préciser la définition du mode, tout en tenant à y intégrer sa musique natale, malgré de nombreux points de friction entre *diêu* vietnamiens et la définition qu'il proposait<sup>7</sup> ; cette dernière était une sorte de fourre-tout qui prenait aux définitions occidentales et les augmentait de toutes les caractéristiques que ce musicologue a cru pouvoir considérer comme « modales »<sup>8</sup>.

Ces définitions appellent plusieurs questionnements, dont ceux concernant l'existence même de la modalité<sup>9</sup>, avec un parallélisme possible, sinon probable, entre cette construction et celle du concept de musique « folk », en opposant celle-ci à la musique dite « d'art »<sup>10</sup>. D'autres interrogations ont été formulées dans l'appel à contributions pour ce numéro : peut-on se contenter d'une définition unique du mode, notamment pour des musiques s'échelonnant de l'Antiquité jusqu'à nos jours, et se déployant dans une aire géographique qui va de

<sup>1</sup> Note: le multilinguisme assumé par NEMO nous a conduit à harmoniser, autant que faire se pouvait, les différentes conventions typographiques inhérentes à chacune des langues utilisées dans la revue (pour les articles et tribune de ce premier numéro l'anglais et le français). Le lecteur sera, de ce fait, peut-être dérouter au premier abord par certaines conventions qu'il n'a pas l'habitude de trouver dans les articles de la langue utilisée : nous avons préféré une présentation plus compacte de la revue à une fidélité à des normes, supposées être rigides mais qui restent de toute manière changeantes au sein d'une même discipline, et dans un même pays.

<sup>2</sup> Nous n'avons reçu aucune proposition centrée sur la modalité populaire extra-européenne, comme si ce sujet ne concernait pas trop l'ethnomusicologie traditionnelle: encore une question qui est proposée aux auteurs pour le deuxième numéro de NEMO.

<sup>3</sup> [Winnington-Ingram, 1936, p. 2].

<sup>4</sup> [*idem*].

<sup>5</sup> Après avoir cité les traits caractéristiques (les « notions ») d'un mode selon la conception occidentale à son époque, en l'occurrence [Chailley, 1960, p.5] « 1) [le] choix d'une octave type, unité fondamentale, 2) [la] tonique, identifiée au 1<sup>er</sup> son de l'octave type, 3) [la] hiérarchisation des autres degrés sur le plan *harmonique* par rapport à la tonique : dominante, etc. 4) [l']identité de fonction de tous les sons reproduisant à une octave quelconque un des sons de l'octave type [et] 5) [l']indifférence à la hauteur absolue, à l'ambitus, à l'octave employée, aux tournures mélodiques utilisées », l'auteur conclut : « La majeure partie des contresens traditionnels provient d'une tendance naturelle à *rétopoler* (on excusera le néologisme), c'est-à-dire à appliquer rétrospectivement à des conceptions anciennes des notions qui leur sont postérieures. Dans le cas présent, aucun des caractères que nous venons de dégager n'appartient primitivement à ce que nous nommons uniformément des "modes" ».

<sup>6</sup> Voir l'article de François Picard dans ce numéro de NEMO ([Picard, 2012]).

<sup>7</sup> Ceci concerne par exemple la notion d'*ethos* du mode, toujours controversée en ce qui concerne son adéquation à une définition du mode. Par ailleurs, les caractéristiques modales des *diêu* et des *pathet* sont toujours en discussion(s), à l'exemple de celle que le lecteur peut retrouver dans [Powers et al., 2001, "Mode, §V: Middle East and Asia (ii) Pathet (a) South-east Asian modal systems"].

<sup>8</sup> François Picard s'en fait également l'écho dans son article cité dans une note précédente.

<sup>9</sup> Voir par exemple [Powers, 1992a ; 1992b].

<sup>10</sup> Voir [Gelbart, 2007].

l'Écosse et de la Bretagne jusqu'à l'Iran, l'Inde et la Péninsule arabique ? La « tonalité » est-elle liée à la modalité, et comment ? La modalité influence-t-elle d'autres musiques, et est-elle influencée par elles, et comment ? Quel est le rôle de la formularité dans la modalité ? Des *maqām* supposés être pentatoniques, ou basés sur une structure pentatonique, peuvent-ils être des « modes » ? Peut-on toujours parler de modalité dans le cas de structures non-octaviantes, ou encore basées sur des constructions scalaires en polycordes ? Modalité et tempérament sont-ils compatibles ? etc.

Toutes ces questions montrent que les concepts de « mode » et de « modalité », bien que très répandus, sont encore largement à préciser et nécessiteront probablement, au-delà des quelques réponses et interrogations supplémentaires qui sont proposées dans ce numéro, plusieurs volumes de notre revue<sup>11</sup> pour pouvoir traiter du champ très large de recherches que ces mots recouvrent.

### Les articles de ce numéro<sup>12</sup>

Nous proposons en premier lieu dans ce numéro la tribune d'un des acteurs clef de la modalité en Bretagne, le chanteur (et anciennement clarinettiste) **Erik Marchand**, qui nous raconte sa rencontre avec la modalité, ses questionnements et les réponses successives qu'il a essayé d'y apporter, notamment par le concept d'*entendement modal*. Cette tribune se profile en contrepoint de l'article de **François Picard** qui, par delà une définition générale de la modalité, aborde également le pentatonisme et rappelle que, selon lui, ces deux mondes ne sont pas à confondre ; l'auteur rapporte son expérience personnelle au contact de Trần Văn Khê et de divers acteurs des musiques modales, en France<sup>13</sup> ou ailleurs, tout en présentant les résultats de recherches récentes effectuées avec les programmes *Monika* et *Psautiers*.

Un deuxième article, également généraliste tout en présentant une lecture particulière de la modalité<sup>14</sup>, est celui de **Markos Skoulios** sur le chant byzantin ; il n'existe pas, à notre connaissance, de revue complète, contemporaine et<sup>15</sup> concise, dans une langue occidentale<sup>16</sup>, des séquelles des théories de Chrysanthos le Madyte et de la Commission Patriarcale de Constantinople de 1881<sup>17</sup> : cet article est par conséquent une occasion que nous avons le plaisir de saisir pour pallier à ce manque concernant un des aspects les plus singuliers et les plus complexes de la modalité orientale. Bien évidemment, il est difficile de traiter du chant byzantin sans évoquer la musique ottomane dont **Jacob Olley** nous raconte l'évolution, à travers celle du *maqām Ṣabā* et de sa représentation par différents acteurs et annotateurs<sup>18</sup>.

**Rosy Azar Beyhom** évoque, sur l'exemple du traité du docteur Mikhā'il Mashāqa, la difficulté inhérente aux descriptions (pas si) anciennes de la modalité, et met en relief la contradiction profonde entre le désir moderne de systématisation des descriptions modales, et les réticences, même d'un moderniste comme Mashāqa, à s'engager sur le chemin réducteur de la description intervallique pure des modes de la musique arabe.

<sup>11</sup> Ou d'autres revues ou livres, bien évidemment.

<sup>12</sup> Chaque article est revu par au moins deux membres du Comité de rédaction de NEMO compétents dans le domaine concerné par l'article, ainsi que par la rédaction de la revue ; certains articles traitants de problématiques complexes ou larges sont parfois revus par des spécialistes extérieurs, en plus des deux revues usuelles : il n'en reste pas moins que les opinions exprimées dans ces articles, tribunes ou essais restent de la responsabilité de leurs auteurs, de même que le niveau de la langue utilisée, notamment pour les articles en anglais.

<sup>13</sup> Le lecteur se rendra probablement compte en lisant la tribune d'Erik Marchand et l'article de François Picard de la différence de rendu d'un même matériau par les deux auteurs, formulé par le premier et perçu par le deuxième, mais également de leur perception radicalement différente de la modalité, le premier considérant les variations dans les grandeurs des intervalles utilisés comme une composante importante, sinon indispensable de la modalité, et le deuxième ne reconnaissant aucun rôle au tempérament ou aux différences dans les échelles et les intervalles utilisés.

<sup>14</sup> Enrichie par la démarche comparatiste de l'auteur avec la musique turque.

<sup>15</sup> Relativement.

<sup>16</sup> Ou même, par exemple, en arabe.

<sup>17</sup> La deuxième « corrigeant » la première (celle de Chrysanthos).

<sup>18</sup> De Cantémir à Behar et Popescu-Judetzu en passant (entre autres) par Yekta Bey, Ezgi, Arel, Signell et Wright.

Dans un cadre plus axé sur la résolution de problèmes particuliers de la modalité en Orient, l'article d'**Amine Beyhom** traite de deux énigmes persistantes des musiques arabe et indienne, la « curieuse » division en 28 « quarts » à l'octave de Shihāb-a-d-Dīn al-Ḥijāzī (XIX<sup>e</sup> siècle) en Égypte et le système intervallique en 22 *śrutis* à l'octave de Bharata Muni, et rappelle une des alternatives au concept d'« égalité » des intervalles véhiculé par la musicologie moderne.

Enfin, « last but not least », l'article de **Richard Dumbrill** remonte aux sources écrites de la musique et nous livre les résultats de dizaines d'années de recherches sur les origines écrites de la modalité, en questionnant l'attribution supposée de cette origine à la Grèce Antique et en refusant les dogmes normalisants institués par la musicologie occidentale du XIX<sup>e</sup> siècle<sup>19</sup>.

#### POST-SCRIPTUM

*Il nous faut ici nous faire l'écho du récent colloque organisé par l'association DROM à Brest, du 16 au 18 novembre 2011, avec pour sujet « La modalité, un pont entre Occident et Orient »<sup>20</sup>: cette manifestation culturelle et académique a, pour la première fois en Bretagne, rassemblé acteurs de la modalité, scientifiques et auditeurs autour d'un thème peu évoqué pour les musiques populaires en Europe, et constitue une démarche que nous considérons comme complémentaire de celle de NEMO pour les aspects pratiques et théoriques de la modalité d'aujourd'hui.*

<sup>19</sup> Et non réellement remis en cause depuis, comme nous pouvons nous en rendre compte presque quotidiennement à la lecture d'articles ou de livres traitant de la modalité.

<sup>20</sup> Voir [Drom, 2012a; 2012b; 2011].

## بخصوص المقامية<sup>1</sup>

خصّصنا العدد الأول من مجلّة "نيمو" (NEMO) لفكرة المقامية؛ وهو لن يكون وحيداً بما أنّ الموضوع يتناول موسيقى الشرق والغرب على حدّ سواء، القديمة منها والمعاصرة، الدينية والدينيوية، الآلاتية والغنائية، الصوتية كما الإلكترونيّة. غير أنّ الدعوة للمساهمة في هذا العدد اقتضت على المقامية خارج أوروبا، أي أنّه تمّ مؤقتاً إبعاد مقامية القرون الوسطى أو البوليفونية في الغرب من إطار البحث، على أن يضمّ الموسيقى التقليدية الأوروبية<sup>2</sup>.

كانت هناك تساؤلات عديدة في صلب هذه الدعوة، فالتعريف بالمقام، حتى الكلاسيكي منه وهو لـ"وينغتون إنغرام" Winnigton-Ingram، بحاجة لإعادة نظر:

"المقام هو الأساس سؤال حول العلاقة الداخلية بين النوتات في إطار سلّم، وبالأخصّ حول هيمنة إحداها على الأخرى باعتبارها القرار على أنّ هذه الهيمنة قد تأكّدت بإحدى الطرق الآتية أو جميعها: كثرة التكرار، ظهورها في موضع بارز كأول أو آخر نوتة، تأخير ظهورها المتوقّع عبر نوع من التزيين"<sup>3</sup>.

من المؤكّد أنّ دعاء هذه التعريفات ينسون إيراد بقية النصّ، خاصة أنّه يكشف بوضوح مفهوم المقام في الغرب:

"إنّ سلّم 'ماجور' الحديث هو مثال عن مقام"<sup>4</sup>.

وبهذا، قيل كلّ شيء حول تصوّر معيّن للمقامية، هو نفسه الذي أدانه "حاك شاييه" Jacques Chailley<sup>5</sup> عبر إبراز نواقصه في التعريفات الضمنية للمقامية في عصره.

حاول "تران فان خي" Trần Văn Khê عام 1971 تحديد وتوسيع مفهوم المقام<sup>6</sup>، مع إدخال موسيقى بلاده، بالرغم من نقاط جدل عديدة بين "الديوو" (diêu) الفيتنامية والتعريف الذي اقترحه<sup>7</sup>؛ هذا التعريف كان عبارة عن خليط من التعريفات الغربية المزيّدة بكلّ الخصائص التي ظنّها هذا الموسيقولوجي "مقامية"<sup>8</sup>.

أثارت هذه التعريفات عدّة تساؤلات بعضها بخصوص وجود المقامية<sup>9</sup> بحّد ذاتها مع توازٍ ممكن أو على الأقلّ معقول بين معنى المقامية ومفهوم الموسيقى "الفولك"، ومقابلة تلك الأخيرة بالموسيقى المعروفة بالـ"فنيّة"<sup>10</sup>. تناولت الدعوة للمساهمة في هذا العدد تساؤلات أخرى مثل: هل يمكن الاكتفاء بتعريف أوحد للمقام لموسيقىات تمتدّ من العصور القديمة وحتى يومنا هذا، وتنتشر جغرافياً من اسكتلندا وبريتانيا حتى إيران، الهند وشبه الجزيرة العربية؟ هل هناك علاقة بين "النعمية" والمقامية وما هي مقومات هذه العلاقة؟ هل تؤثر المقامية بموسيقىات أخرى وهل تتأثّر بدورها بأنواع موسيقية

<sup>1</sup> ملاحظة: إنّ تعدّد اللغات الذي تعهدت نيمو أن تقدّمه جعلنا نوفّق بين عدّة معايير توبوغرافية لغويّة (في هذا العدد، الإنكليزية والفرنسية). ربّما يجد القارئ نفسه في بادئ الأمر إثر هذه التوفيقات الغير معتادة في حالة ضياع. لقد فضّلنا المحافظة على بنية وقوالب شكلية للمقالات وبالنتيجة أخلينا في الوفاء لبعض القواعد المقترضة أنّها جامدة غير أنّ هذه القواعد تبقى مرنة ومتغيرة في المجال نفسه وفي البلد نفسه.

<sup>2</sup> لم نستلم أية مقالة تتناول المقامية الشعبية الغير أوروبية كما لو أنّ هذا الموضوع لا يهمّ الإثنوموسيقولوجيا التقليدية، ومن هنا إقترح إلى الكتاب للعدد الثاني من مجلّة نيمو.

<sup>3</sup> [وينغتون-إنغرام، 1936، ص. 2].

<sup>4</sup> كالسابق.

<sup>5</sup> يشرح شاييه [1960، ص. 5] خصائص المقام بحسب المفهوم الغربي على النحو الآتي: "1) إختيار ديوان نموذج عبارة عن وحدة أساس، 2) جعل القرار الدرجة الأولى من الديوان النموذج، 3) تراتبية الدرجات بالنسبة لبعضها البعض بحسب قواعد الهارمونيّا وانطلاقاً من القرار: الـdominante، إلخ. 4) التعريف بمهام الأصوات الموجودة على مسافة ديوان انطلاقاً من الديوان النموذج [و] 5) موقف تجاهل بالنسبة للارتفاع الثابت، المسافة، الديوان المستعمل والعبارات الموسيقية الخاصة" ثمّ يختتم: "تأتي أغلبية التعارضات التقليدية من نزعة إلى 'عصرنة' (ونرجو أن يعزّنا القارئ على استعمال هذا التعبير الجديد)، أي إلى تطبيق خصائص حديثة على مفاهيم سبقها في الزمن. ونوضّح في موضوعنا هذا أنّ أيّاً من الخصائص التي ذكرناها يوافق في الأصل ما نسمّيه بالمقام".

<sup>6</sup> أنظر مقال فرانسوا بيكار في هذا العدد من مجلّة نيمو [بيكار، 2012].

<sup>7</sup> نجد هذا النوع من الالتباس مثلاً في مفهوم إيثوس المقام، وبالأخصّ في مدى إيهاء الإيثوس في التعريف بالمقام. من ناحية أخرى، تبقى خصائص الـdiêu والـpathet في بحث مستمرّ، ويمكن للقارئ أن ينظر في هذا الأمر إلى [باورز وآخرون، 2001، المقام (mode)، المقطع: V الشرق الأوسط وآسيا (ii)، Pathet (a) الأنظمة المقامية في جنوب شرق آسيا].

<sup>8</sup> يتحدّث فرانسوا بيكار عن هذا الأمر ضمن مقاله الذي ذكرناه في حاشية سابقة.

<sup>9</sup> أنظر مثلاً [باورز، 1992a؛ 1992b].

<sup>10</sup> أنظر [جيلبارت، 2007].

وما هي مقومات هذه التأثيرات المتبادلة؟ ما هو دور الصيغية في المقامية؟ هل يمكن أن نعتبر تركيبات السلام الخماسية مقامات؟ هل يمكن التحدث عن مقامية في وجود تركيبات سلام لا تصل إلى الديوان، أو تركيبات مبنية على عدّة أوتار؟ هل يتفق التعديل والمقامية؟ إلخ. تُظهِر هذه الأسئلة كلّها أنّ مفهومي "مقام" و"مقامية" المنتشران، يقصهما فعلاً التحديد وهما بحاجة برأينا، إلى عدّة أعداد من مجلّتنا<sup>11</sup> كي تتمكن من تغطية حقل الأبحاث الواسع لهذين المفهومين.

## مقالات هذا العدد<sup>12</sup>

نعرض في مطلع هذا العدد لما كتبه المغنيّ (وعازف الكلارينيت سابقاً) **إيريك مارشان** وهو شخص ذو الدور الفاعل في المقامية في بريطانيا. يخبرنا السيد مارشان عن خبرته وعلاقته مع المقامية، أسئلته والأجوبة المتتالية التي حاول أن يقدمها وخاصة فيما يتعلّق بالفهم المقامي (entendement modal).

يتبع ذلك وتباين جدير بالذكر، مقال لـ **فرانسوا بيكار** الذي يعرض تعريف عام للمقامية، كما يتطرق إلى التركيبات الخماسية للسلام. يشدّد الكاتب على أهميّة التفرقة بين المقامية والتركيبات الخماسية، ويشارك القارئ خبرات شخصية من مثل لقائه مع تران فان خي وغيره من الخبراء في عالم الموسيقى المقامية في فرنسا<sup>13</sup> أو في غيرها من البلدان. ويقدم أخيراً نتائج أبحاث حديثة العهد أجريت بالاستعانة ببرنامج "مونيكّا" **Monika** وبرنامج "بسوتيه" **Psautiers**.

أما المقال الثاني، فهو لـ **ماركوس سكولوس** ويدور حول الترتيل البيزنطي. وهو أيضاً مقال عام لكن مع قراءة فريدة للمقامية<sup>14</sup>. وبما أنّه لا يوجد، بحسب علمنا، أي مقارنة كاملة، معاصرة<sup>15</sup> وموجزة لمضاعفات نظريات خريزانتوس الماديّ ولجنة 1881 البطريركية التي عُقدت في القسطنطينية، فقد اغتنمنا الفرصة، وكان من دواعي سرورنا أن يكون هذا المقال وفي هذا الموضوع ليغطّي ويشرح النظرة البيزنطية وموقعها الفريد في إطار المقامية الشرقية.

طبعا من الصعب التحدّث عن الترتيل البيزنطي دون أن نذكر الموسيقى العثمانية، وفي هذا السياق يكتب **جاكوب أوللي** في المقال الثالث عن تطوّر هذه الأخيرة، من خلال دراسة حول مقام الصبا وتصوره من قبل العديد من الباحثين والمدوّنين<sup>16</sup>.

تعرض **روزي عازار بيهم** مثلاً من رسالة الدكتور ميخائيل مشاققة الموسيقية، توضّح فيه صعوبة تبيان حقيقة التوصيف للمقامية. إنّ الرسالة ليست قديمة العهد، لكن الدراسات الحديثة التي قامت حولها أظهرت تعارض عميق مع منهجية مشاققة. هذا الأمر يظهر في الاختصارات التي لم تحافظ على مقارنة مشاققة الغنيّة لمقامات الموسيقى العربية وأبعادها.

يعالج **أمين بيهم** في مقاله، وفي نطاق موجّه أكثر نحو إيجاد حلول لمشاكل تختصّ بالمقامية في الشرق، مسألتين صلبتين في الموسيقى العربية والهندية؛ المسألة الأولى وهي التقسيم "الغريب" لديوان شهاب الدين الحجازي (القرن التاسع عشر) في مصر إلى 28 "ربع"، والمسألة الثانية تقسيم ديوان بحاراتا موني في الهند إلى 22 شروفي. ثمّ يجتم أمين بيهم بالإشارة إلى إحدى الخيارات المتاحة لمفهوم "التساوي" بين الأبعاد، المتناقّل عبر الموسيقىولوجيا الغربية.

<sup>11</sup> أو بالطبع، في مجلّات أو كتب أخرى.

<sup>12</sup> تمتّ قراءة كلّ مقال من قبل عضوين من لجنة نيمو العلميّة، مختصّين بموضوع المقال كما نظر فريق تحقيق المجلّة بكلّ المقالات وأحال بعضها الذي تناول مواضيع شديدة الإختصاص إلى قراءة من قبل خبراء خارج اللجنة العلميّة، وذلك بالإضافة إلى القراءتين الأساسيتين. يجدر بنا أن ننوّه أن الآراء المذكورة في المقالات والكتابات هي على مسؤوليّة كتّابها، وكذلك الأمر بالنسبة إلى مستوى اللغة المستعملة، وخاصة للمقالات باللغة الإنكليزية.

<sup>13</sup> على الأرجح أنّ القارئ سينتبه إلى الفرق في وجهات النظر بالنسبة للأمر الواحد، عند قراءته لما كتبه إيريك مارشان ومقال فرانسوا بيكار، حيث أنّ آراء الأول مبنية على خبرة حياتية، وآراء الثاني تأسست على ملاحظاته. يعود ذلك بالطبع إلى فرق في مقارنة المقامية بين الإثنين، فالأول يعتبر أنّ الاختلافات بين الأبعاد المستعملة هي عنصر أساسي لا غنى عنه في المقامية، بينما الثاني لا يعطي أهميّة للتعديل أو للفروقات الموجودة بين السلام وبين الأبعاد المستعملة.

<sup>14</sup> اغتنت هذه النظرة لأن الكاتب أنشأ مقارنة مع الموسيقى التركية.

<sup>15</sup> نسبياً.

<sup>16</sup> من كاتيمير (Cantemir) إلى بهار (Behar) وبرويسكو-جوديتز (Popescu-Judetetz) مروراً بـ يكتا بي (Yekta Bey)، إيزغي (Ezgi)، أريل (Arel)، سيغنيل (Signell) ورايت (Wright).

وأخيراً، يعود بنا مقال **ريشارد دميريل** إلى المصادر المكتوبة للموسيقى، ويقدم لنا نتائج لعشرات السنين من الأبحاث حول الأصول المدونة للمقامية، ثم يتساءل ما إذا كانت اليونان القديمة تعتبر فعلاً المرجع لهذه الأصول، كما يعبر عن رفضه لعقائد التطبيع التي أنشأتها الموسيقىولوجيا الغربية في القرن التاسع عشر<sup>17</sup>.

### كلمة لا بد منها

يجدر بنا في إطار هذا العدد أن ننوه بالمؤتمر الحديث العهد الذي نُظِم من قبل مؤسسة دروم في بريطانيا من 16 إلى 18 تشرين الثاني 2011، وكان محوره "المقامية، جسر بين الغرب والشرق"<sup>18</sup> وقد جمعت هذه المبادرة الثقافية والأكاديمية، ولأول مرة في بريطانيا، فعاليات في مجال المقامية من خبراء وباحثين، تحلقوا حول موضوع ندر ذكره في الموسيقىات الشعبية في أوروبا. إننا نعتبر أنّ مبادرة دروم تكمل النفحة التي اختارتها مجلّة نيمو لكن عبر تطبيقات عمليّة ونظريّة للمقامية في أيامنا هذه.

<sup>17</sup> تُبين لنا قراءتنا الحالية لمقالات وكتب تتناول موضوع المقامية أنه لم يحصل إعادة نظر لبعض المبادئ منذ وضعها في القرن التاسع عشر.

<sup>18</sup> أنظر [دروم، 2012a، 2012b، 2011].

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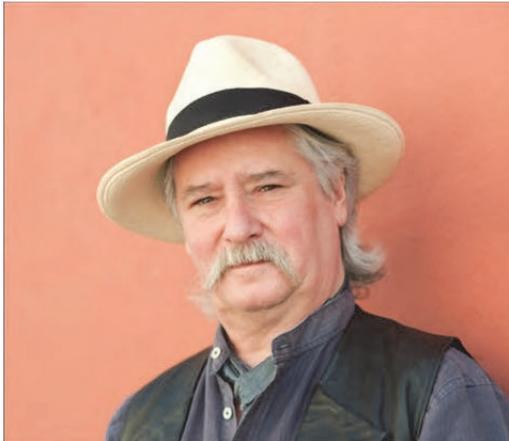
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## UNE MUSIQUE MODALE DE TRADITION POPULAIRE EN OCCIDENT

Tribune d'Erik Marchand\*



Erik Marchand (crédit photo : Éric Legret)

### D'OÙ JE PARLE

Être issu d'une culture où la musique est modale mais géographiquement et historiquement occidentale, voilà une assertion qui semble innocente mais qui peut interroger. La « modalité » n'est-elle pas la couleur musicale des mondes orientaux ? N'a-t-elle pas disparu dans ses formes originelles, « traditionnelles », dès le XIX<sup>e</sup> siècle, peut-être même bien plus tôt ? Pourtant, dans les musiques populaires et notamment en Bretagne, la modalité est une des bases structurantes d'expressions bien vivantes jusqu'aujourd'hui.

C'est dans ma jeunesse, en comparant ce que je chantais avec les notes d'un piano, que j'ai pris conscience pour la première fois que les vérités musicales étaient multiples.

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Il aurait peut-être été plus confortable de considérer que mes maîtres chantaient faux (?), mais j'ai eu l'intuition que c'était le piano qui l'était... face à l'autre justesse que je lui proposais.

C'est donc par la perception des degrés différents de ceux du tempérament égal que j'ai découvert ce que j'appelle l'« entendement modal ».

J'utilise le terme *entendement* à dessein car, dans bien des situations, des collègues musiciens auraient tendance à limiter la pratique modale à l'utilisation de degrés différents de ceux du tempérament égal ou, *a contrario*, à l'utilisation de type de compositions et d'improvisations utilisant ce tempérament mais oubliant, maltraitant ou refusant les schémas harmoniques de la musique savante occidentale.

Pour moi, l'entendement modal est tout cela à la fois, mais...

Dans un premier temps l'entendement modal ne se construit pas, comme le jazz modal, sur un refus de l'harmonie occidentale (j'utilise aussi le concept d'entendement harmonique) mais sur une construction musicale préexistante qui, malgré les collusions avec l'harmonie, n'a pas modifié ses fonctionnements de base. C'est ainsi que j'ai très rapidement compris pourquoi les musiques du Proche-Orient et d'Europe orientale, de Suède ou d'autres régions du monde me parlaient plus que celle du transistor des années soixante : elles appartenaient au même monde de la modalité.

### LA BRETAGNE, UNE ZONE PRIVILÉGIÉE POUR LA TRADITION ORALE EN EUROPE DE L'OUEST

La Bretagne est historiquement un pays trilingue : à l'ouest la Basse Bretagne (*Breizh Izel*), jusqu'au XX<sup>e</sup> siècle majoritairement de langue bretonne<sup>1</sup> (langue celtique brittonique, de la même famille que le gallois et le cornique de Cornouaille britannique), à l'est la Haute Bretagne, appelée aussi pays Gallo où la langue principale était le gallo, localement qualifié de patois, langue romane proche des dialectes parlés dans la Vendée et la Normandie voisines. Enfin le français « standard », d'abord parlé par les élites et dans certaines villes pluriethniques, a pris au cours du XX<sup>e</sup> siècle une place prépondérante pour des raisons probablement aussi politiques qu'économiques.

La tradition orale est restée très forte en Bretagne. Nous pourrions tenter d'en préciser les raisons à d'autres occasions mais cette réalité a permis à une musique – que d'aucuns pourraient qualifier d'archaïque – de vivre avec dynamisme et de se transmettre jusqu'à aujourd'hui.

Les formes musicales y sont bien sûr très locales comme dans bon nombre de traditions orales en Occident. Cependant certaines formes peuvent traverser la limite linguistique et certains thèmes musicaux peuvent être chantés en breton ou dans une forme « littéraire orale » du gallo.

Le Centre Bretagne est la région centrale de la Basse Bretagne. C'est une zone rurale dont la population des villes les plus importantes ne dépasse pas aujourd'hui les 10 000 habitants. Parmi les terroirs bretons où la pratique musicale est particulièrement dynamique ce « pays » a développé un certain nombre de singularités.

C'est la région dans laquelle j'ai choisi de m'installer pour apprendre, pratiquer, m'inspirer de et enfin transmettre la musique.

## LA MUSIQUE DU CENTRE BRETAGNE EN QUELQUES MOTS

En Bretagne, à de rares exceptions micro-géographiques<sup>2</sup> ou liées aux débordements humains générés par la fête (!), la musique est soit instrumentale soit vocale. À part quelques expériences parfois très intéressantes au début du siècle, la rencontre entre les deux expressions n'a vraiment existé (et encore sans s'imposer) que depuis la deuxième partie du xx<sup>e</sup> siècle

Dans le Centre Bretagne, pour le chant à danser<sup>3</sup>, il existe deux répertoires : celui des thèmes musicaux (les « tons » ou *tonioù* en breton) et celui des poèmes dit « chansons » en français local (*kanaouernnoù*<sup>4</sup> en breton).

Les « tons » sont généralement chantés au moins une fois sans texte lors de l'introduction ou « appel à la danse », d'abord dans une forme non mesurée puis, sur la métrique de la danse et *a tempo*.

D'autre part, pour une partie du répertoire appelée airs longs (*tonioù hir*) ou airs doubles (*tonioù doup*), une moitié centrale de la ligne mélodique de la deuxième partie du *ton* est chantée sans texte.

Ces deux situations<sup>5</sup> font du chanteur un artisan d'une ligne mélodique pour laquelle il pourra être judicieux (de bon ton) d'apporter quelques (micro-) variations. Le chanteur se rapproche de l'instrumentiste, « monnaie », subdivise les temps, se libère un court instant de la force de l'accent tonique. Il prend conscience d'une ligne mélodique en tant que telle, il n'est pas seulement l'interprète d'une chanson dont le texte impose les variations mais il jongle entre poème et musique tantôt modifiant une ligne mélodique au profit du texte ou de la danse, tantôt modifiant la métrique d'un vers, y ajoutant des syllabes sans sens, utilisant des redoublements de phonèmes pour rompre une éventuelle monotonie rythmique.

Et lorsqu'il chante des chansons « à écouter », pour lesquelles mélodie et texte sont plus conventionnellement

liés, il conserve cette part de musicalité, d'art de mêler le poétique au musical.

## DÉCOUVERTE DES ÉCHELLES SPÉCIFIQUES DANS LE CHANT POPULAIRE BRETON

Le chant breton *a capella* se suffit à lui même et jouit d'une liberté d'échelles, d'intervalles, très importante. Les bons chanteurs, surtout pour la danse mais aussi pour les chants à écouter, montent leur tonique du début à la fin de l'interprétation. Cette ascension peut atteindre jusqu'à deux tons.

Au cours de leur interprétation ils passent par des périodes d'« emphase » durant lesquelles certains intervalles s'étirent. Les tierces, les quartes, les quintes peuvent ainsi gagner 10 à 15 cents. Ceci explique probablement en partie l'ascension en cours d'interprétation. Ces périodes d'emphase peuvent être liées à l'énergie développée pour dynamiser la danse mais aussi à des raisons plus purement liées à la dynamique propre de la mélodie, du caractère que l'interprète décide de renforcer. Parfois, plus fatigué ou moins habité par la mélodie il resserrera certains degrés qu'il aura auparavant « emphatisé ».

Dans tous les cas, bien sûr, les échelles utilisées sont assez éloignées des 12 demi-tons de l'échelle tempérée savante occidentale.

Sans rentrer dans une description détaillée des espaces de liberté de l'interprète je me permets de donner ici la place de certains intervalles utilisés par les chanteurs Centre Bretons, famille qui est la mienne.

Comme en musique orientale on entend dans la musique du Centre Bretagne plusieurs tierces, de la tierce mineure à la tierce majeure.

Ces tierces sont les plus souvent médianes<sup>6</sup> et il en existe au moins deux dont l'une est proche des 5/6 de ton et l'autre des 5/4 de ton. Les septièmes, en général sous-toniques, suivent la même logique que les tierces, de même pour les sixtes.

Les secondes ne sont presque jamais mineures mais majeures voire majeures élargies, et parfois médianes. Très souvent, si elle ne sont pas « justes » (parfois un peu hautes), les quartes sont médianes et ceci presque systématiquement lorsque la tierce est majeure mais aussi significativement lorsqu'elle est médiane<sup>7</sup>. Les quintes sont le plus souvent justes ou élargies. Il est intéressant de noter que les échelles utilisées par les sonneurs (joueurs) de clarinette traditionnelle de ce terroir sont très semblables.

Rien que ces particularités me semblent déjà montrer que la modalité du Centre Bretagne est différente de la modalité orientale telle que j'ai pu l'approcher ces dernières années auprès de divers musiciens et enseignants, ou encore à l'écoute d'enregistrements de diverses régions de cette partie du monde.

## ETHNOMUSICOLOGIE APPLIQUÉE

Même si notre travail ressemble parfois à celui d'un ethnomusicologue, je ne me considère pas ainsi car les analyses que nous avons pu mener avec mon camarade Thierry Robin ont toujours eu pour but d'asseoir la création musicale sur des exemples tirés de l'analyse des chants populaires ou d'être utilisées, dans le même but, dans le cadre d'un processus de transmission du savoir.

*Le travail avec Thierry Robin*

## LES RAISONS

À la fin des années quatre vingt j'ai eu la chance de rencontrer Thierry « Titi » Robin guitariste, compositeur et surtout joueur de *ūd*. Ce dernier, intéressé par la musique bretonne voisine de son Anjou natal me contacta pour travailler avec lui sur la création d'un répertoire qui lierait le chant de Basse Bretagne au *ūd*, à sa liberté modale et à des compositions issues des thèmes traditionnels bretons.

Nous avons d'abord découvert, en situation de jeu, des échelles très spécifiques. En tant que chanteur, je ne ressentais pas la hauteur précise (ou imprécise) des degrés que j'utilisais. Face à mon camarade instrumentiste j'avais une vision plus nette de ce qui ce passait : la corde dessinait les échelles utilisées, les variations ...

Ceci nous a passionné durant plusieurs mois et nous avons finalement décidé, face à la richesse que nous entrevoyions, de mener une recherche sur les échelles utilisées par les chanteurs de Basse Bretagne. Nous souhaitions par la suite élargir notre champ d'étude au pays Gallo puis à d'autres répertoires pratiqués en France métropolitaine (Poitou, Auvergne, etc.) et comparer les échelles que nous aurions pu identifier avec les modes orientaux tant la parenté nous semblait évidente, à ce moment déjà.

## DES OUTILS « LÉGERS »

Au début des années quatre-vingt, il n'y avait pas d'ordinateur disponible pour les jeunes chercheurs que nous étions<sup>8</sup>. Je livre ici quelques extraits du rapport intermédiaire que nous avons rédigé pour présenter l'avancement de notre recherche aux collectivités territoriales qui nous soutenaient :

« Il a fallu rechercher des outils simples permettant la mesure des intervalles ; la lecture de revues spécialisées nous a permis de choisir deux outils qui, ensemble, permettent cette analyse bien que individuellement leur fonction première soit différente ; il s'agit du répéteur U4 Akai et de l'accordeur multi-tempérament Korg 1200.

Méthodologie : Le répéteur U 4 Akai enregistre en numérique 7 secondes d'un message sonore qu'il restitue selon deux modes possibles :

- le défilement régulier à vitesse réduite sans modifier la hauteur du signal enregistré,
- le défilement "manuel" qui permet de faire défiler le message à n'importe quelle vitesse y compris la vitesse 0 ce qui pourrait s'assimiler à un "arrêt sur image" sonore.

Nous étalonnons l'accordeur Korg 1200 sur une "tonique" stable de la mélodie analysée de manière à ce que sous l'impulsion de cette note l'aiguille du cadran corresponde au 0 d'un degré. Ex. : Skolvan – *la* à 467 Hz ; par rapport à ce *la* la "tonique" de l'interprétation est *do*.

Nous mesurons ensuite les intervalles entre cette note étalon et tous les degrés des différentes phrases de la mélodie (unité : le cent).

Intérêt : Souple à l'utilisation et d'un faible prix de revient, ces deux outils utilisés conjointement permettent une analyse fiable des degrés par le chercheur ; ce contact direct avec la mélodie ainsi qu'avec la mesure des intervalles et de leur variabilité, met en évidence les précautions qui sont à prendre dans l'analyse des données ultérieurement produite par un matériel plus sophistiqué. Ex. : lorsque plusieurs valeurs existent pour une même note :

- quelle en est la cause ?
- quelle hauteur choisir : zone intervallique, moyenne arithmétique, repérage de "palier", choix "subjectif" de la part de l'auditeur ?

Limites : L'effort produit par le U4 pour maintenir la hauteur de la note quelle que soit la vitesse de défilement du message engendre une distorsion du son dans le cas où l'enregistrement analysé n'est pas "propre" (bruits blanc et autres), ce qui fait que certains degrés ne peuvent pas être mesurés. Un deuxième désavantage est que la notation manuelle des valeurs successives est très longue. Enfin, la subjectivité de l'observateur pour le choix d'une hauteur peut être importante ».

Nous avons eu par la suite accès à des outils plus perfectionnés, mais il n'y avait à l'époque pas encore de logiciel « Praat »<sup>9</sup>, donc des réponses données souvent insatisfaisantes à certains niveaux.

Plus tard, à partir de trois échantillons tirés de la *gwerz*<sup>10</sup> de Skolvan chantée par Mme Bertrand le CNET<sup>11</sup> nous a fourni un graphique du déroulement mélodique<sup>12</sup> donnant une succession de 20 valeurs par dixième de seconde des différentes fréquences<sup>13</sup>, la courbe de l'énergie en décibels<sup>14</sup> et un sonogramme (Fig. 1).

La limite essentielle du système d'analyse du CNET étant l'imprécision dans la mesure des degrés, nous avons été conduits à contacter les ingénieurs de l'IRCAM<sup>15</sup> qui disposaient d'analyseurs plus performants des fréquences fondamentales, reliés à des ordinateurs travaillant en temps réel. Les résultats transmis étaient très intéressants mais là encore l'objet imprimé issu de ces analyses n'était pas d'une lecture facile : les analyses étaient transférées sur une « partition » avec les différentes modifications de hauteur des degrés spécifiés au dessus de chaque point d'analyse ... (Fig. 2).

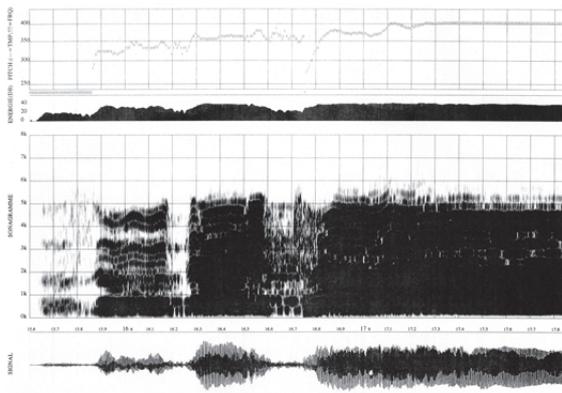


Fig. 1. Exemple d'analyse (réalisée par Didier Becam du CNET) d'un extrait de la *gwerz* de Skolvan chantée par Madame Bertrand.

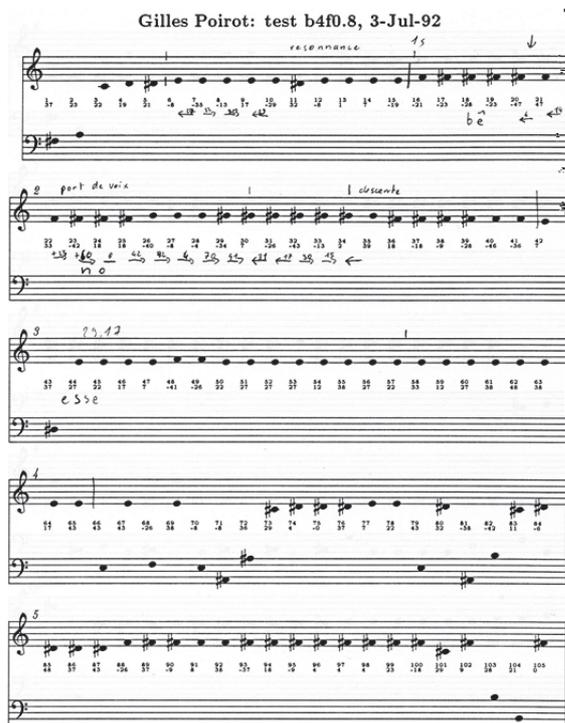


Fig. 2. Exemple d'analyse (réalisé par Gilles Poirot de l'IRCAM en 1992) d'un extrait de la *gwerz* de Skolvan chantée par Madame Bertrand.

### La suite

À ce point de notre étude nous étions prêts à revoir avec nos partenaires la forme des résultats produits par leurs outils et à les adapter, mais notre vie de musiciens devint si riche que notre dynamisme de chercheur se trouva dilué dans l'énergie à donner dans la création, les tournées, les enregistrements ...

Pour autant, l'entendement modal reste jusqu'aujourd'hui un moteur dans notre vie de musiciens et je dirai même plus dans notre vie de citoyens, d'humains.

Je suis convaincu que la prise en compte fondamentale des limites des 12 demi-tons de la musique occidentale du XIX<sup>e</sup> siècle (voire des prétendus 24 quarts de ton de la musique arabe du XX<sup>e</sup> siècle) peut enrichir considérablement la palette du compositeur, de l'interprète ou de l'improvisateur. Cette conviction m'a amené à créer une structure d'enseignement, de transmission et surtout de réflexion sur ces ententements modal/aux.

### LA TRANSMISSION : « KREIZ BREIZH AKADEMI »

Nous l'avons vu, la pratique de degrés spécifiques en musique bretonne est restée présente dans le chant *a capella* ou dans certaines formes instrumentales. Cependant la rencontre entre chant et instrument n'étant intervenue qu'à partir de la seconde moitié du XX<sup>e</sup> siècle, le système « d'arrangement » des lignes mélodiques traditionnelles avec les nouveaux instruments s'est construit, dans un premier temps, sur l'exemple du *folk song* américain ou de la musique dite « celtique », surtout irlandaise, très à la mode en Bretagne en ces périodes et qui avait déjà exploré depuis longtemps les rapports possibles entre ligne mélodique modale et harmonisation. Par la suite le jazz devint aussi une source d'inspiration pour ce type d'arrangements.

Bien évidemment dans ce type de travail l'étalon utilisé à la base est la division en 12 demi-tons égaux. Les chanteurs ou certains solistes instrumentaux se doivent donc d'oublier leurs échelles initiales ou au mieux, d'avoir l'intelligence de ne dévier de l'égalité que dans certains cas et sans exagérer. Certains thèmes, trop porteurs d'un sentiment modal fort, seront rejetés du jeu d'orchestre et cantonné à la pratique *a capella* heureusement toujours bien vivante.

Cette constatation nous avait déjà amené, Thierry Robin et moi, à monter notre trio de base<sup>16</sup> et à inviter d'autres instrumentistes à nous rejoindre à certaines occasions. Le besoin de partager nos questionnements avec de jeunes musiciens en devenir, mais de niveau professionnel, m'a poussé à créer un lieu de transmission qui est devenu « Kreiz Breizh Akademi »<sup>17</sup>.

Cette « école » vise à transmettre les subtilités mélodiques et rythmiques de la musique de Basse-Bretagne. Construit sur les interprétations de grands/es chanteur/euses de la tradition orale, le répertoire tente de respecter les échelles propres des thèmes en s'enrichissant d'une « écriture » instrumentale ne faisant pas appel au système harmonique.

Notre travail est d'abord un travail d'analyse des thèmes choisis, une construction de ces thèmes en suites<sup>18</sup> et enfin la construction d'« arrangements » qui en respectent dans la mesure du possible les échelles, la prosodie et les formes rythmiques.

COMMENT ÉCHAPPER AUX DANGERS  
DE LA SYSTÉMATISATION

Aujourd'hui je dirige mes élèves vers des choix de thèmes dont les degrés sont sensiblement différents des 12 demi-tons de l'échelle tempérée occidentale. Ce choix n'a pas pour but l'exotisme mais oblige les interprètes à s'éloigner de leurs habitudes liées à l'apprentissage de la musique savante occidentale ou surtout à l'écoute de musiques tempérées courantes ou à travers la pratique d'instruments à tempérament fixe comme la guitare ou l'accordéon : il est ainsi plus difficile d'appliquer, notamment dans le cours de l'improvisation, des « recettes » issues de l'harmonie.

Les problèmes de tempérament des instruments sont dès le départ apparus comme primordiaux. Nous l'avons vu, notre musique vocale monodique et *a capella* laisse au soliste une grande liberté d'interprétation, notamment en ce qui concerne la hauteur des degrés de la mélodie. Si des instruments à grande subtilité comme le violon ou le *ūd* permettent la même souplesse, des instruments à notes « préfabriquées » (de type harpe, accordéon, instruments à touche frettée) nécessitent un choix préalable.

Lors de nos premières expériences, j'avais par exemple choisi de ne jouer que 3 tierces : la mineure, la majeure, et une médiane tempérée à 40 cents au dessus de la tierce mineure. Ce choix était lié au fait que je pratiquais régulièrement ce dernier degré (au chant ou à la clarinette), qu'il est très courant en chant et musique bretonnes et qu'il correspond à une moyenne entre une tierce médiane basse<sup>19</sup> et une tierce médiane haute<sup>20</sup>.

Cependant, et si ce faisant nous nous rapprochions de l'interprétation de nos maîtres, nous restions frustrés de ne pouvoir être plus libres dans les propres interprétations de notre musique. Aujourd'hui, nous sommes toujours en recherche mais nous nous orientons vers une plus grande subtilité dans l'utilisation des intervalles en nous basant, selon les circonstances et les instruments, sur des logiciels pour l'électronique, des adaptations de luthiers pour les instruments frettés ou à ligatures ou encore sur une meilleure précision de l'accordage pour la harpe par exemple.

Au début de nos travaux, plusieurs musiciens de notre communauté souriaient de ce qu'ils considéraient comme un phantasme : les vieux chantent ou jouent faux, c'est normal, ils ne sont en général pas cultivés (la musique chez nous est majoritairement rurale). Le système musical « moderne » et occidental est régi par de vraies règles vers lesquelles il est normal de tendre car ceci est la marche vers une modernité rassurante et peut-être vers une mondialisation rémunérante.

Nous avons préféré rester fidèles aux émotions (fortes) que portent les chants de l'oralité basse bretonne. Nous sommes particulièrement séduits de trouver dans le monde des fonctionnements comparables à ceux de cette musique d'origine paysanne qui aurait pu paraître très (trop) liée à son terroir. Nous avons réussi à entraîner dans nos questionnements le public et surtout de nombreux jeunes musiciens et chanteurs de talent.

Aujourd'hui, nous tentons parfois de rendre plus scientifique notre approche mais avant tout nous espérons pouvoir construire des échanges pérennes avec des artistes et des chercheurs d'autres cultures musicales modales, en Orient et ailleurs.

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## Notes

<sup>1</sup> Le breton comme le gallo rassemble de nombreux dialectes. Dans les dialectes bretons l'accent tonique est assez ou très présent et placé sur des syllabes différentes. Ceci peut entraîner des modifications dans l'interprétation des thèmes musicaux.

<sup>2</sup> En Pays Gallo, à l'est, des joueurs de vielle, violon, ou accordéon diatonique chantent parfois une phrase ou deux en même temps qu'ils jouent.

<sup>3</sup> Le chant à danser du Centre Bretagne ou *kan ha diskan* est une forme de chant à répondre entre 2 chanteurs (parfois, mais rarement, 3).

<sup>4</sup> Au singulier "*kanaouern*" comme pour "*ton*". Les terminaisons *où* ou *ioù* sont l'une des marques du pluriel en Breton.

<sup>5</sup> Et surtout la première.

<sup>6</sup> Suivant l'exemple de mon ami et prédécesseur Nando Aquaviva, j'utilise le terme « médiane » (*mezanne* en corse) au lieu du terme « neutre » qui me semble correspondre plus à une absence de sentiment musical (majeur, mineur) qu'à une position objective du degré concerné.

<sup>7</sup> Cette position ne me semble pas courante dans les musiques orientales, encore que le choix de la tonique puisse être différent pour une oreille bretonne ou orientale.

<sup>8</sup> Le PC apparaîtra plus tard.

<sup>9</sup> Programme freeware très performant pour la recherche en linguistique, développé par Peter Boersma et David Weenink (voir [Boersma and Weenink, 2012]) et utilisé par plusieurs centres

d'enseignement de musicologie pour l'analyse de hauteurs de mélodies.

<sup>10</sup> La *gwerz* est une forme de plainte, de chant narratif, en langue bretonne.

<sup>11</sup> Le CNET (Centre National d'Étude des Télécommunications installé à Lannion en Bretagne) avait développé des outils dans le domaine de la reconnaissance de la parole.

<sup>12</sup> « PITCH ».

<sup>13</sup> En Hertz.

<sup>14</sup> « ÉNERGIE ».

<sup>15</sup> Institut de Recherche et Coordination Acoustique/Musique, à Paris.

<sup>16</sup> Album « An Heñchoù Treuz » chez Ocora [Marchand and Robin, 1990] et « An tri Breur » chez Silex [Marchand, Robin, and Khan, 1991].

<sup>17</sup> Trois collectifs ont à ce jour enregistré chacun un album qui témoigne de ce travail : ces albums sont [“Norkst”, 2006], [Izhpenn 12, 2009] et [Elektridal, 2011] chez Innacor Records ; consulter le site [Drom (Association), 2012] pour plus de détails sur le fonctionnement de Kreiz Breizh Akademi.

<sup>18</sup> Je rappelle ici qu'un même poème peut être porté par plusieurs lignes mélodiques.

<sup>19</sup> Plus ou moins 30 c. au dessus de la tierce mineure tempérée.

<sup>20</sup> De 50 à 60 c. et plus au dessus de la tierce mineure tempérée.

## BACK TO MODALITY

### MUSICAL MODES REVISITED

François Picard\*

#### HAROLD POWERS' INITIAL STANDPOINT

As early as 1958, Harold Powers<sup>1</sup> wrote that he could easily describe and produce examples of the basic characteristics for a specific South Indian raga. He said he could describe or define the concept of its essential features. However, attempting at comparing a raga to an ecclesiastical mode would be unthinkable on the basis of the immense generality of the proposition.

Fifty years later Elizabeth Markham<sup>2</sup>, one of the most distinguished scholars of Medieval Japanese music<sup>3</sup> and a former disciple of the late Laurence Picken, postulated that the melody of some Japanese Buddhist chant was composed in an ecclesiastical Aeolian mode on A (with one sharp), or, in a Mixolydian mode on A (with only two, rather than three, sharps). Later she concluded that the *Sōrai kada* (Fig. 2), a 6.123.5 pentatonic set on E in mode-key *hyōjō*, was in fact a diatonic ecclesiastical Dorian.

In order to establish a better comparison of any piece with ecclesiastical modes, I would suggest a transnotational<sup>4</sup> transposition in order to place the *pycnon* (the characteristic Major third)<sup>5</sup> on *fa-sol-la* (written *F-G-A*).

The *Global chant database*<sup>6</sup> for a *fa-la-do-ré-do* incipit, yields many works, mostly from the 5<sup>th</sup> mode (*fa-do*), although the *finalis* is usually *fa*, and not *ré*.<sup>7</sup>

Had we searched for a scale and a *finalis* instead of looking for an incipit, we would have found something similar to an ecclesiastical Dorian/Aeolian mode. Most musicians would have spontaneously said that it was F major moving to D minor.

However, *fa la* ending on *ré* is also and simply the first Psalm<sup>8</sup> tone (Fig. 1).

I would argue that this piece would be best described, although not defined, according to Tran Van Khê's teaching, as an anhemitonic pentatonic 6 1 2 3 5 6 with pivotal notes 6 1 3, that is the Chinese *yu diaoshi* 羽譜調式. Comparing it to the ancient Shen Gua<sup>9</sup> B1/531 mode system of the Tang dynasty, we would probably

assimilate the *Sōrai kada* to the 4 *Zhongliu diao* 中呂調, or to a form of *la* in a Jiazhong tone.



Fig. 1. The First Tone extracted from the *Paroissien romain* 119.

In respect of Christian ecclesiastical music, Powers came to the conclusion that its modal system is fundamentally an analytical method used for the classification of melodies, but that in Indian music praxis the raga system forms the practical basis of self-renewing spontaneous creativity.

#### TRAN VAN KHÊ'S APPROACH

It is now appropriate to present Professor Tran Van Khê's introduction to the question. Although his theoretical article on modes was only published in 1990,<sup>10</sup> as a young Vietnamese musician and musicologist, he had been trained in the West and had known Jacques Chailley, Constantin Brăiloiu, Lee Hye-Gu, Ravi Shankar and Munir Bashir for some time. Furthermore, his own perception and his teachings, his experience and praxis, his exchanges, had led him to a sophisticated perception method of tonal, modal, and pentatonic music, analytically as well as in its reproduction. His comprehensive bibliography included an article published in 1971<sup>11</sup> and his more detailed "*Pour une histoire universelle de la musique*".<sup>12</sup> After many passionate discussions with Jacques Chailley, his master,<sup>13</sup> he wrote:

"4) About Musical modes in Asia

In Asian music, there are neither major nor minor modes. They cannot either be compared to Church or to Medieval modes. In Asia, the concept is both a complex and a dynamic one. It is complex because it can only be defined in respect of its various components such as the scale, the hierarchy between degrees, specific ornaments, melodic motifs or *formulas*, modal mood, ethos, and so forth. It is dynamic because even if all of these elements are present, they do not reveal the mode within as these are only ingredients of the mode but not the mode itself. [...] In order to extract the mode within Asian music, a musician must be able to blend all of the ingredients into a mostly improvised melodic development leading to a modal mood bearing various names according to whence from it comes: *rāga* in India, *dastgāh* or *avāz* in Iran, *maqam* in Arabian countries, *makam* in Turkey, *mugham* in some Asian parts of the Soviet Union, *điệu* in Vietnam, and *patet* in Indonesia."<sup>14</sup>

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I have argued elsewhere<sup>15</sup> that pentatonism and modality must not be confused. In a list of mode nomenclature, in the aforementioned paper,<sup>16</sup> additionally to *điêu* and *patet*, Tran Van Khê distinguished melodic music (of the Chinese family type), heterophonic music (from South-East-Asia, itself classified into equiheptatonic and equipentatonic divisions of the octave) and modal music (of Central and Southern Asia, Indian and Persian family types; West Asia, Turkic-Arabian family types).

It must be observed that there is a strong ideological determination in the choice of mode as a qualifier for Oriental or popular music. Placed in front of an hegemonic system, built with history, famous names, vast repertoire, systems of assumed precision, writing, assumed autonomy of Western Classical composition, musicians and musicologist took for granted the ability for Oriental musicians to improvise and link this to a complex system comparable to constructions of the Ancient World rather than related this to indigenous spontaneity. Thus modality came to be perceived as an excellent transnational motto. Only this ideological bias can explain why Tran Van Khê attempted at rationalising Vietnamese and Indonesian music through a modal concept. He also explained as clearly as he could considering the period at which he was writing, a concept which he named, “aspect” or “aspect d’octave” after Brăiloiu<sup>17</sup>.

“On each of the five degrees of the pentatonic scale *fa sol la do ré*, a mode can be created: *sol la do ré fa - la do ré fa sol - do ré fa sol la - ré fa sol la do.*”

This is a textual translation of the Chinese concept of *diaoshi* 調式, of which the Chinese theory knows five: *gong shang jue zhi yu* 宮商角徵羽 (*do ré mi sol la*, now written 1 2 3 5 6). However, the meticulous study of the Chinese repertoire rarely shows the use of such a concept. When it does, such as in the 20<sup>th</sup> century *Mei’an qinpu* zither book of notation, there is no tune in *jue diaoshi* (*la do ré fa sol*, which “aspect” does not include the fifth). The Chinese determination of the “aspect” or *diaoshi* is as loose as the modern Western Dorian or Mixolydian determination: you look at the notes, you determine the

scale and the key, and you look at the *finalis*, the last note which is played. This is enough to find out the name of the mode, or the “aspect”, or *diaoshi*. Such refined and well documented music repertoires as Fujian Nanyin or Kunqu drama distinguish between the various scales (keys, *guanmen*) and include many melodic types (*gunmen*). It is neither a question of improvisation, nor is it the respect of rules, but it is a practical matter of the choice of fingering on the flute and of the tuning of the lute.

The French historical modal concept approach and its application in non-Western and mainly Asian music is in its own way simpler and a more efficient one than all the erudition and controversies spear-headed by Harold Powers in his ever-questioning of modal universality.

In his seminal article<sup>18</sup>, Tran Van Khê defines the fundamental characteristics of modes as they appear in *rāga*, *dastgāh*, *avāz* and *maqām* as having:

1. A modal scale with its own specific structure.
2. A hierarchy between degrees.
3. A typical melodic formulation for each mode.
4. A modal emotion (ethos) linked to each form of mode.

As secondary characteristics, Tran Van Khê adds ornamentation as well note and silence lengths.

#### MUSICIANS’ PERCEPTION OF MODE

I shall not attempt at giving here my own definition of what mode is although I have developed my own concept through listening, modelling, analysing, playing, as well as through controversy, teaching, writing. As an ethnomusicologist, I am aware of various postulates, strategies and concepts which lead to endless disagreements.

#### Scale or formula

Musicians and musicologists can build up a pool of modes distinguishable, preferably, by their scale hierarchy, or distinguishable because of specific formulations, specific ornaments, or even with praxis in various cultures, such as *maqām* or *rāga*.

1 = F

Fig. 2. “Sōrai kada”, Markham (Soorai Kada – *Shokyoo yoobun kada shuu*, Japan, end of the 13<sup>th</sup> century. Transcription by Elizabeth Markham [2008, p. 34]).

Anecdotically, Jean-Christophe Frisch, a Baroque flautist of great liberalism and knowledge, was once working on a cross-over program with Syrian musicians. His counterparts were playing, let us say *maqām rāst*, or *bayāṭī*. He asked what he could or could not do. One of the musicians, an expert, told him: “you have to know the whole system, all of the scales, the central elements on which to focus, the compulsory variations. You start with such a tetrachord or *jins*, and then modulate to this other one, then to that one or that other one (according to the genre and the type of meter), and end on that one. You need also to know all the repertoire which has been previously played by the masters.” Another musician, also an expert, told him: “you use that fingering as tonal centre, the second note is a bit flattened, the third is reached from the fourth and the fifth should be clearly articulated. You have to alternate flat and pure seven — and for the sixth? — just follow me.” He did.

The same position was brought up by two respected musicians in Brest<sup>19</sup>. Ross Daly explained that one has to live with the *maqām* in order to understand and know it. If you have, for instance, a good, accurate, precise graphic description of a person, it will nevertheless be impossible to recognise him or her among a crowd. But if you have met that person once before, even after years and wearing different clothes, you will recognize them at once. However, it can take many years before knowing that you know only just a small part of the local repertoire. On the other hand, Titi Robin explained that he listened to the musicians he met, began to play with them, played a theme, not even a scale, and all played along pleasurably, efficiently, and successfully.

### *Voice and fingerings*

Some of the best analytical presentations of modal music have been made by mentally mapping the positions of the fingers onto the unfretted fingerboard of the *ūd*<sup>20</sup>. The presentation *a capella* of the modal system of the Catholic Church by Dominique Vellard<sup>21</sup> shows long term strategies where solmisation of *mi-fa* is as important as the constant reference to the main note, even if you never play it. On a Moroccan night concluding Ramadan, there were three royal cantors singing responsorially. They sung complex melismas and ornamentations, with sophisticated modulations. Two of them excelled and ended with astonishing, beautiful, and imaginative figures on the main note of the *maqām*. The third one, who was without any doubt the spiritual winner of the competition, never sang that note, the *rāst*. However, it was always felt as each note, each figure, each formula, remained suspended towards the end. This could only have happened at the end of the last night of the Holy Month.

Debussy or Bill Evans have a keyboard approach to modality, mentally mapping black and white. Others have a modal concept linked to specific tunings, or

*scordaturas*, similar to the Chinese fretless *qin*-zither. As for myself, I need to imagine which fingerings on my uneven temperament six-hole flute correspond to the *fa-sol-la* so that I can understand Dominique Vellard's modes, Titi Robin's lute improvisation, a Brittonish *gwerz*, a song played on the *cabrette* bagpipe, a ballad in *naryin* genre, the modulation in Bach's *Matthais Passion* with various renderings of “O Haupt voll Blut und Wunden”.

I would like also to investigate the practice of French musicians playing “musiques traditionnelles de France”, a difficult concept akin to “French Folk music” where “traditional” means “traditionally informed performances”. They have their local theory, practice, fingerings, and names of modes. At first I was astonished, even shocked, by what I felt was a poor and even a wrong usage of “*plagal*” and “*authentic*”. I was also for the peculiar usage of “Dorian” with Jazz musicians. As an ethnomusicologist, however, I can understand their music and practice as they play it. In the current practice of French bagpipe music (where “French” is to be taken as “French folk music”, but not necessarily including Brittany), taking Eric Montbel<sup>22</sup> as paradigm, there are two modes. “*Authentic*” which is characterized by the tonic played with the left (upper) hand closing the fingerholes, and “*plagal*” which is characterized by the tonic played with both hand closing the fingerholes. If the right (lower) hand has four holes and not three, it is not clear, at least for me, if “*plagal*” is the lowest note possible, or a fourth below the left hand. If we take a modern, standard soprano recorder (*Blockflöte*) in C, it will mean that “*authentic*” has G as tonic, while “*plagal*” has C or D. If we take a six-holes *tirwistle* in D, it is clear that “*authentic*” has G as tonic, while “*plagal*” has D.

### *Temperaments*

The very unspecific un-tempered status of my wooden flutes (*traverso*, Günther Körber, Berlin, 1977) is invaluable for the Chinese traditional pentatonic repertoire, the Brittonish *gwerz*, the Indian *rāga*, the Arabian *māqām*, Gregorian or Byzantine chant :  $C D E^{2/2 \text{ flat}}$ ,  $F G A B^b$  or  $B^{1/2 \text{ flat}}$  or B, with a structural *do ré fa sol la* on C (D or low G according to modern pitch), only one real major third (F-A), and a chromatic note which is missing between C and D. But my old friend master Chen Zhong from Shanghai showed me that with the same flute he could play perfectly tempered while maintaining the supreme esthetical criteria, the “local flavour” (*difang weidao* 地方味道). At the absolute opposite, such a trained and accomplished musical couple as Rosy Azar Beyhom and Amine Beyhom<sup>23</sup> could not agree to identify as “the same” two performances by the same musician, the reputed Habil Aliev himself, of “Bayât-i Shirâz” played before and after the fall of Soviet Union and, with it, the fall of equal temperament.<sup>24</sup>

We shall not mention the many musicians, listeners, or musicologists who like Harold Powers himself, upon

hearing an un-tempered *gamelan* perceived and analyzed it as modal. Then what of Erik Marchand<sup>25</sup> training his Breizh Akademy students to produce perfect quarters-of-tones instead of mapping a specific path in the forest of coloured notes.<sup>26</sup> Then what of Ibrahim Malouf unable to play a simple *nihawand* or a *jaharkah* because of the lack of an Arabian (blue?) note.<sup>27</sup>

This research is still in progress, but a possible explanation could be that Powers, Marchand, and Malouf do perceive the difference between un-tempered and equally tempered music as a fundamental characteristic allowing them to identify music as being modal or not, when modal musicians mostly refer to a hierarchy between fixed and mobile tones. In another terms, the difference between diatonic and *Zalzalian*<sup>28</sup> intervals is not a matter of intervals, but one of structure.

#### TOWARDS THE RESOLUTION OF THE APORIA RESULTING FROM THE ABSENCE OF THE FINAL BEFORE THE END

Many theoreticians and musicians, in Asia (including China) and in Europe, define (or use an implicit definition) in which the mode/*diao* of a specific piece is defined firstly by its scale (the set of notes needed to play the piece), secondly by the degree on which it ends. It is probable that those theoreticians and musicians know that this is very problematic. One of the problems is that if the final note gives the answer to the question “to which mode are we listening”, this would mean that there is no modal feeling prior to reaching the end of the piece. This contradiction is resolved by playing a drone note of reference or the tonic, the Indian *sa*. To my own amazement, many *musiciens traditionnels* performing in France, especially with Medieval music<sup>29</sup>, proceed in this fashion. They define modality from the pitch of the drone. But then, what if the drone is not the modal pole, the reference? Another question is if they know that this method does not work, why not choose another method?

Harold Powers has shown<sup>30</sup> that the difference between authentic and plagal modes (taking the example of modes 1 and 2) during the Renaissance has been assigned alternatively to three characteristics and not just one: ambitus, system and final, final alone.<sup>31</sup>

#### *Cultural, universal, transcultural*

Powers’s proposal offers one of the best sets of solutions when dealing with autochthonous discourses, historically and culturally determined ensembles, and systems. Ethnomusicologists as well as anthropologist have a tendency to think that way and this is the case too with historians. This is known as an *emic* point of view<sup>32</sup>. But in a way it is a regression towards the admittance of intercultural incommunicability. This is why I chose to

complete the internal understanding of each system with the observation of people in contact. By “people in contact”, I mean a musician from a modal culture who listens to and plays with musicians from another modal culture. A definition of modality is the possibility for someone trained in a modal system to understand the musical journey of a musician from a different culture and to follow the path a musician is taking in order to understand his strategy without *emically* be knowledgeable of his system. I have noticed this with Soufiane Feki, trained in Tunisian *maluf*, and with Arabian, Turkish, Persian, Azeri, Baluch, Indian, Tajik-Uzbek, Uygur music, and being able to appreciate it, understand it, describe it, analyze it, while not being able to appreciate Japanese, Chinese or Javanese music.

So I call modality what Dominique Vellard and myself, and my students, hear as modal in the *gwerziou* sung by Yann-Fañch Kemener<sup>33</sup>, such as the intriguing and stimulating dialogue between doublebass player Riccardo Del Fra and Breton singer Annie Ebrel<sup>34</sup>.

Like Erik Marchand, I call modality his compulsion to blend his voice with Titi Robin’s *‘ud* rather than with a harmonic / rhythmic guitar with an added solo guitar<sup>35</sup>.

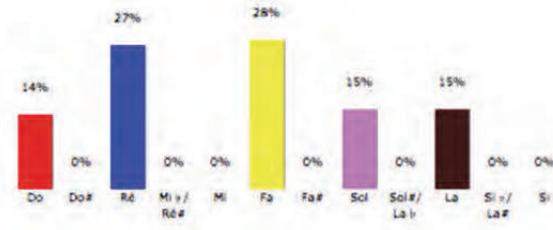
#### A TENTATIVE ZURÜCK ZUR GENERAL MUSIKWISSENSCHAFT

The identification of a mode from its key-signature and from specific formulations, although largely attested by ethnography, is irrelevant for the purpose of theory, since it does not specify how this formula could be related to a specific scale and to the hierarchy of its degrees.

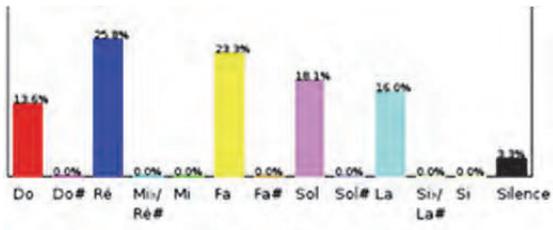
Ross Daly is certainly right, and modality needs more time to process. But his own perception of a mode as a person that you can recognize in a crowd suggests that a mode placed in a cultural context is reflected as a mental image resembling a face or a map, but not a place in a system or a name. After years of work, Jacques Chailley invited by me to celebrate his 80<sup>th</sup> birthday at a France Culture radio program on *Modes*. This concluded with a clear definition: modal music is a journey between different stations, a peregrination, a travel from place to place. Westerners very early on noticed<sup>36</sup> that Persian and Arabian musicians spoke of their music as “going from this city to that one, or going from the finger to the elbow”, or “going from Ispahan to Babylon”. In fact, this is the old concept of *sayr* (travel) used by Arabian musicians or *seyr* (seyir) by Turkish musicians.<sup>37</sup>

We should now take Tran Van Khê postulation more in depth, and attempt at building up an idea of mode while ignoring the final and the specific formulas. While developing a tool that I designed with Monika Stern, who was struggling with the atypical scales of Vanuatu, we (Monika Stern, Nicolas Meeùs, François Picard, Alice Tacaille)<sup>38</sup> have developed the *Monika* process: it gives a synthetic histogram of a musical piece by counting the

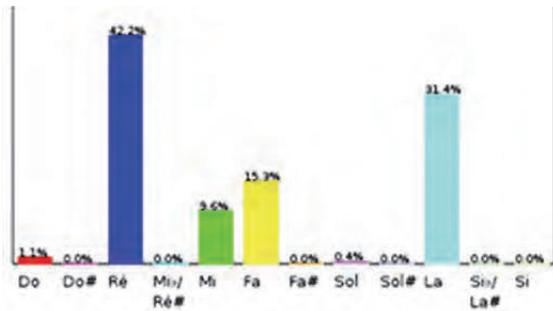
total duration of each note. The specific intonation is considered as irrelevant, and there does not seem to be a need to go from a twelve-note system to a twenty-four note system, since there is no relation of an existing mode where a specific note (like *do re mi...*, *sa re ga...*, *shang che gong...*) could take more than two different fingerings in the same piece. But this is still an open question. However, we came up, through the imbrication of *Monika*<sup>39</sup> and *Psautiers*<sup>40</sup>, to develop the hypothesis that the time orientation from one note to the other, the journey, is not the only criterion, but the duration of each<sup>41</sup> is concurrently important. Here are some histograms<sup>42</sup>: respectively Japanese, Chinese, Korean, Balinese, Peruvian, Guyana, Bach, Syriac, India, Renaissance, Breton.



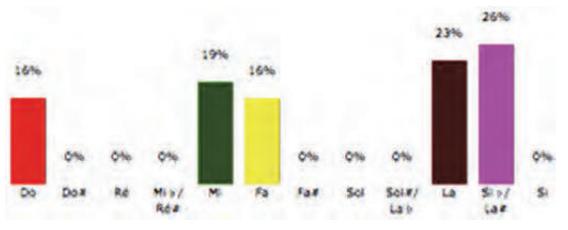
Histogram 1. *Sōrai kada* – Japan (Markham).



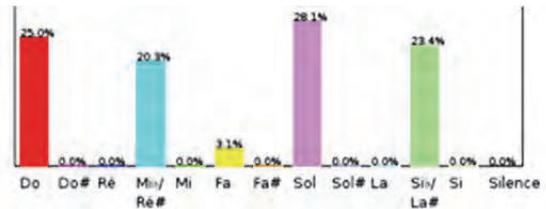
Histogram 2. *Pingsha Luo yan, Mei'an qinpu*, China (Picard).



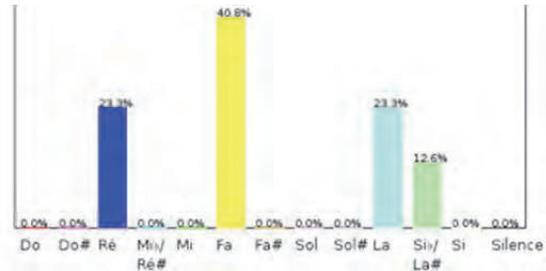
Histogram 3. *Taegum Sinawi* (Shon).



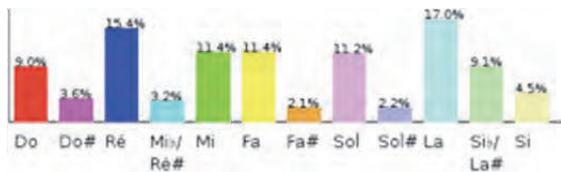
Histogram 4. *Hudan mas*, Bali (Picard).



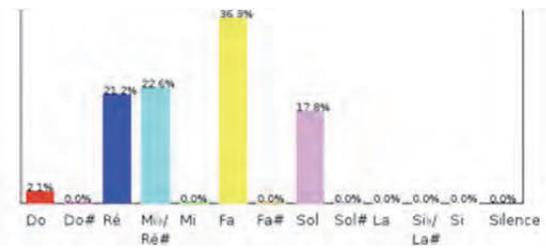
Histogram 5. *Qayra*, Quechua, Peru (Saint-Sardos).



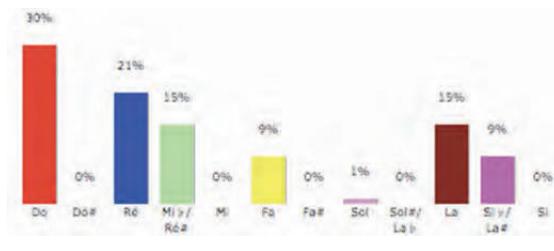
Histogram 6. "Tamanuwa" Wayäpi, Guyana (Picard).



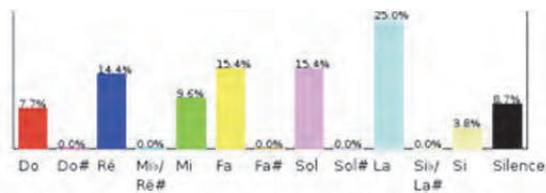
Histogram 7. JS Bach BWV 1004 (Picard).



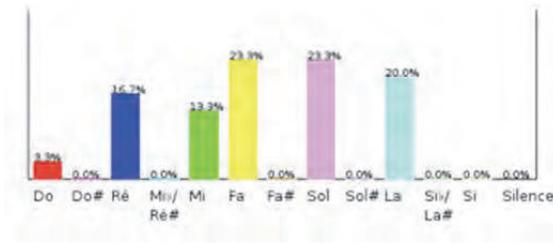
Histogram 8. 761 "Syriac" (Chédid).



Histogram 9. *Alāp rāga bageshri*, Hariprasad Chaurasia (Debove).



Histogram 10. Ps CXXXVII, Marot (Tacaille).

Histogram 11. *Gwerz Skolvan*, Brittany (Picard).

At a glance one can work out that a Buddhist chant from medieval Japan is closer to Chinese instrumental music from modern times than to any other music. The same applies for the *gwerz*, best compared to Renaissance Psalm. As for J.S. Bach, one can understand easily that in the structure of the scale *F C G D A E*, the tonal centre is *D*, and the key is *D* minor. But is it tonal, or modal? It is Bach, respect!<sup>43</sup>

#### CAN WE SPEAK OF MODE IN THE ABSENCE OF A SYSTEM?

Probably all specialists and connoisseurs will agree that with modal music each piece performed is related to a specific mode which is part of a larger system, composed of main and derivative modes, regular or standard and transformed or irregular modes.

The generation of a modal system can mainly be done in two ways:

1. Displacement of the origin on a fixed rule with uneven graduations (the famous Jazz modes obtained by playing only white keys on the

keyboard and changing the origin or final).

2. While keeping a unique origin (*do*, *C*, *sa*...) making different alterations of the second, third, fourth, sixth, seventh<sup>44</sup>.
3. Combining both, which is the traditional way of working out *maqāmāt*.

From an *emic* point of view, it is still difficult to speak of such a generality as “mode” or “modality”, and one cannot but just approve with those who wish to speak of *rāga*, *dastgāh*, *avāz* and *maqām*, *mode*, *ton*, *diao*, *Iraq*, *Isfahan*, *Rast*, *Bāgeshri*, *plagal* in terms of their own cultures, times, places, and people. But the ability of human mind to switch from one specific system to another cannot be denied, and it has been developed at its best to my knowledge, by Bulgarian musicians and Indonesian musicians, both belonging to cultures using both pentatonism and modality<sup>45</sup>, and familiar with tonality because of modern music education.

If Psalm CXXXVII by Marot and Bèze<sup>46</sup> is modal, how could we say that “Skolvan” is not for the reason that the singers have — to our knowledge — no names for it and that the specific mode they use is not part of a larger system? The proof of the inner knowledge of modality is the ability showed by such experts as Yann-Fañch Kemener and Françoise Atlan to correct mistakes in the written transmission<sup>47</sup>, to correct inflexions and to fit it in traditionally informed performance, a musicologically correct rendition.

As a last proof that modality<sup>48</sup> exists<sup>49</sup>, Jacques Chailley agreed with me that the clearest criterion would be to be able to hear a musical piece based on a *do*-mode, ending on *do*, as modal<sup>50</sup>.

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## Notes

<sup>1</sup> [Powers, 1958], accessed 19/02/2010.

<sup>2</sup> [Markham, 2008].

<sup>3</sup> Her own words.

<sup>4</sup> By “transnotation” we mean, after Mireille Helffer, the transfer from one system of notation to another.

<sup>5</sup> The use of the term pycnon here refers to Bräiloiu and the ethnomusicology of pentatonism, not to Ancient Greece.

<sup>6</sup> [Global Chant Database (site), 2012].

<sup>7</sup> [Anon. *Paroissien romain*, 1924].

<sup>8</sup> [Anon. *Paroissien romain*, 1924, p. 119].

<sup>9</sup> [Shen, 1962].

<sup>10</sup> [Trần, 1990].

<sup>11</sup> [Trần, 1971].

<sup>12</sup> [Trần, 1987].

<sup>13</sup> [Chailley, 1960].

<sup>14</sup> “4) Les « modes musicaux » en Asie. Dans les musiques d’Asie, il n’existe pas de « mode majeur » ni de « mode mineur ». On ne peut les comparer ni aux modes ecclésiastiques ni aux modes médiévaux. Le concept de « mode » en Asie est à la fois complexe et dynamique, complexe parce qu’il ne peut être défini que par plusieurs éléments : échelle modale, hiérarchie des degrés de l’échelle, ornements spécifiques, motifs ou formules mélodiques, sentiment modal, sentiment de l’ethos, etc., dynamique parce que si nous réunissons tous

ces éléments, nous ne percevons pas encore le mode, car nous avons simplement des matériaux de base pour reconstituer un mode mais pas encore le mode lui-même. [...] Pour le « mode » en Asie, il faut qu'un musicien utilise les éléments que nous avons cités, dans un développement mélodique souvent improvisé pour que nous sentions réellement le « mode » qui porte des noms différents : *rāga* en Inde, *dastgāh* ou *avāz* en Iran, *maqam* dans les pays arabes, *makam* en Turquie, *mugham* dans certains pays d'Asie de l'Union soviétique, *điêu* au Viêt-nam, *patet* en Indonésie.”

<sup>15</sup> [Picard, 2001].

<sup>16</sup> [2001, p. 119].

<sup>17</sup> [Brăiloiu, 1953].

<sup>18</sup> [Trần, 1990].

<sup>19</sup> [Drom, 2012].

<sup>20</sup> [Chabrier].

<sup>21</sup> [Vellard and Binchois (Ensemble), 1989].

<sup>22</sup> (Note from the editors): French bagpiper and musicologist.

<sup>23</sup> (Note from the editors): Lebanese musicians and musicologists.

<sup>24</sup> [Aliev, 1989] & [Aliev, 1991].

<sup>25</sup> (Note from the editors): well-known Breton singer. See p. 5-10 in the present volume.

<sup>26</sup> (Note from the editors): see the tribune of Erik Marchand, p. 8-9 in the present volume.

<sup>27</sup> All these allegations are based on direct personal observations.

<sup>28</sup> (Note from the editors): the so-called “neutral” intervals in Oriental *maqām* music.

<sup>29</sup> René Zosso, John Wright, Evelyne Girardon.

<sup>30</sup> [Powers, 1981], accessed 06/11/2010.

<sup>31</sup> See also [Meeüs, 1997].

<sup>32</sup> See [Popovic, 2008].

<sup>33</sup> [Kemener, 1988].

<sup>34</sup> [Ebrel and Del Fra, 1998].

<sup>35</sup> [Marchand, Robin, and Hameed Khan, 1991].

<sup>36</sup> “Leurs Notes de Musique ne sont pas des syllabes sans sens et sans signification, mais ce sont, ou des noms de villes du Païs, ou des noms des parties du corps humain, ou des plus ordinaires choses de la nature ; & quand ils enseignent cet Art, ils disent pour marquer les modes, *allez de cette ville à celle-là*, ou, *allez du doigt au coude*: les noms des quarante-huit tons divers, sont des noms de ville, à cause, disent-ils, que ces divers tons sont affectez & particuliers en ces villes” – [Chardin, 1711, v. 5, Chapitre VII « De la Musique », p. 67-68].

Revisited by Rousseau [1768, p.74-75]: “À la vérité les Persans donnent des noms de Villes de leurs pays ou des parties du corps humain aux quarante-huit Sons de leur Musique. Ils disent, par exemple, pour donner l'intonation d'un Air *Allez de cette Ville à celle-là* ; ou *Allez du doigt au coude*. Mais ils n'ont aucun signe propre pour exprimer, sur le papier, ces mêmes Sons”. Emended by Nicolas-Étienne Framery [1791, p. 211-212]: “Ce n'est pas aux quarante-huit sons de leur musique que les Arabes & les Persans ont donné des noms de villes, mais à leurs modes ; ainsi ils disent *allez de cette ville à celle-là*, par exemple, d'*Ispahan à Babylonne* ; ils veulent dire : *passer du mode d'Ispahan au mode Babylonien*.”

<sup>37</sup> See [Feldman, 1993].

<sup>38</sup> (Note from the editors): musicologists members of the PLM research group headed by François Picard.

<sup>39</sup> [Patrimoines et Langages Musicaux, 2012a].

<sup>40</sup> [Patrimoines et Langages Musicaux, 2012b] and [Patrimoines et Langages Musicaux, 2012c].

<sup>41</sup> To develop the metaphoric use of melody as a journey, I use the term “stay” for the duration of a note.

<sup>42</sup> Thanks to the many doctoral students who develop their own analysis through *Monika/Psautier*: Jeanne Saint-Sardos, Shon Eun-kyung, Youssef Chédid, Julien Debove... and to my colleague Alice Tacaille.

<sup>43</sup> Bach is a genius, in that he is able to show the hierarchical nature of the scale, independently of the harmonic context, either modal or tonal.

<sup>44</sup> I never met a modal scale based on the fundamental note of a system (like *rāst* for *maqām* or *sa* for Hindustani music) with diminished or augmented fifth. For instance, *maqām Lāmi* as played by Munir Bachir can be analysed not as *do re<sup>b</sup> mi<sup>b</sup> fa sol<sup>b</sup> la<sup>b</sup> si<sup>b</sup> do* transposed on *Sol*, but as *do re<sup>b</sup> mi<sup>b</sup> fa sol la<sup>b</sup> si<sup>b</sup> do* with the apparent tonic being *Sol*. There is in fact a strong pedal on *Do*. Refer to [Bashir, 1971, track 7 – Taqsim en maqām : Lāmi].

<sup>45</sup> See [Picard, 2001].

<sup>46</sup> [Marot and Bèze, 1563].

<sup>47</sup> As has been shown in [Picard and Roda, 2012].

<sup>48</sup> See also Colloque *Regards actuels sur la tonalité*, Tours, université François-Rabelais, 26-28 novembre 2009.

<sup>49</sup> How could I dare to write on modality without even quoting [Labussière, 1997, p. 110-111].

<sup>50</sup> We can suggest:

[Mansourov, 1975], reissued as [Mansourov, 1992, track 5]; [Mansurov, 1985, track 3], [Bismillah Khan, 1987, v. 19, track 1], [Omar, 1972, v. II, Adjam (track 2)] and [Keyrouz, 1989, track 1].

*MODERN THEORY AND NOTATION  
OF BYZANTINE CHANTING  
TRADITION  
A NEAR-EASTERN MUSICOLOGICAL  
PERSPECTIVE*

*Markos Skoulios*\*

INTRODUCTION<sup>1</sup>

Greek-Orthodox Christian chanting tradition, widely known as “Byzantine music”, is a strictly liturgical, monophonic vocal practice which has more than one and a half thousands of years of continuous history, being one of the most important ritual music traditions in the Eastern Mediterranean area. Notwithstanding its very conservative character, its musicological profile indicates long and multileveled interactions with the plethora of sacred and secular music idioms, found in the area of Near and Middle East. Nevertheless, its peculiar theoretical and notation systems constitute a different philosophy of analyzing and depicting modal monophonic music; in so doing it offers an interesting alternative to the more widely known models of Turkish and Arabian musicology.<sup>2</sup>

In the formation of the distinctive musicological profile of Byzantine chanting tradition a series of particularities must have played an important role. Firstly the above mentioned strictly liturgical character of the tradition, along with the aesthetic austerity of orthodox theology, forced this art to remain purely vocal. Moreover, the dominant role of the religious poetry over the musical dimension is more than obvious in the structure of the compositions; for the melody, rhythm and form serve to underline the meanings and religious messages of the poetic text. Apart from the stylistic peculiarity, the above principles result in a rhythmic structure which follows the metric structure of the text,

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and forms the so-called “tonic rhythm” – to some extent reminiscent of the Persian *Avaz*.<sup>3</sup>

Besides the lack of a canonical periodicity in rhythm, the specific morphology of the tradition categorizes forms of compositions according to the liturgical role and content of the poetic text, as well as the number of syllables per unit of time. Furthermore, the absence of instruments leaves more space for subtle nuances in tonality of the degrees, by means of a large number of non-tempered intervals; thus complying with the complex rules of the so-called “melodic attractions”. This multi-intervallic tonality is organized in manifold ways to form the old fashioned hierarchical system of the *Octoechos*, which serves as a categorization of melodic material based not only on modal but also on morphological and textual characteristics.<sup>4</sup>

The notation system constitutes another important peculiarity of this tradition, being very different in its philosophy, structure and symbols, from all the others that have existed from ancient to contemporary time in the Eastern Mediterranean, as well as the Near and Middle East. The new *parasemantiki* notation, established in the beginning of 19<sup>th</sup> century, is a highly asymmetric symbolic language using a non-phonemic orthography where the pronunciation of its graphemes often depends on the adjacent phrasal context as well as rhythmic, temporal and modal parameters.

Despite the long tradition of theorizing and the large number of musicological literature dealing with the plethora of phenomena involved in Byzantine chanting practice from the ancient times till today, and regardless of the overabundance of transcribed compositions of eponymous composers, this tradition retains its highly oral character. It is this oral character that leaves plenty of free space to the actual performer to interpret a composition in his/her own personal taste, modifying phrases, time and even the intervallic and modal physiognomy of a piece.

The beginning of the 19<sup>th</sup> century coincides with the commencement of the modern period of Byzantine chanting history both in terms of theory and notation.<sup>5</sup> The formation of the contemporary Byzantine chanting musicological profile is mainly based on the “reform of 1814” introduced by the celebrated “three masters”, Chrysanthos of Madytos, Chourmouzos Chartofylax and Gregorios Levitis, the announcement of the Patriarchal “Musical Committee” published in 1888, and the work of Konstantinos Psachos, Simon Karas and Gregorios Stathis in the twentieth century. The present account of modern Byzantine music theory starts with an outline of the contemporary notation system along with a more general account of the most important aspects of the reform of the “three masters”.

THE NEW *PARASEMANTIKI* NOTATION<sup>6</sup>

The long history of evolution of the Byzantine notation system *parasemantiki* reached a critical point at the beginning of the nineteenth century. The “old method” was a partly stenographic system which employed a large variety of symbols, many of which – called “large hypostaseis” – stood for whole musical phrases which were memorized by the practitioners, functioning as a mnemonic code of a system which in practice depended mainly on oral transmission.<sup>7</sup> Many reports from this period attest the ambiguity and impracticability of the method as well as the difficulty of learning it.<sup>8</sup> Attempts to present explanations of the old stenographic method by means of a more analytical notation system started back in the sixteenth century. The first serious attempt was made by the priest Balasios (17<sup>th</sup> century) who was followed by a long tradition of the so called “exegetists” (lit. “interpreters”), the most important among them being Ioannis Trapezountios, Petros Peloponnesios (1730-1770),<sup>9</sup> Petros Byzantios and Georgios Kris.<sup>10</sup> The completion of this long evolution came with the introduction of the new analytical method by the above mentioned “three masters”. Although the customary term “new method” refers mostly to notation, the reform contained a broad reconstruction of the whole theoretical model, mainly expressed through the books of Chrysanthos published in 1821 and 1832, which along with the subsequent announcement of the Patriarchal “Musical Committee” of 1881 became the three most influential texts in the history of Byzantine chant, signalling the beginning of the modern period of its theoretical analysis.<sup>11</sup> The overall reform of the theoretical model was based on a rehabilitation of Ancient Greek musicological elements along with ideas influenced by Middle Eastern as well as Western music theory. However, the establishment of the “new method” did not come about automatically, due to extensive reactions such as the alternative system introduced by Georgios Lesbios – recognized by the Greek government of Kapodistrias and used in Athens until 1948<sup>12</sup> – or the perseverance in the use of the “old method” by leading chanters for long after the introduction and approval of the new one.<sup>13</sup> A long series of attempts to harmonize Byzantine music and employ Western staff notation for its transcription provoked a reaction of the Ecumenical

Patriarchate, expressed mainly by the constitution of the aforementioned “Musical Committee” in 1881.

With the new *parasemantiki* a large number of the older signs were abolished – among them all the “large hypostaseis” – and the significance of the ones that were preserved was more precisely determined. The duration of each sign was accurately defined and special symbols concerning prolongation of duration and pauses of the melody were introduced. A set of signs called *martyries* (lit. “witness sign”) and *fhores* (lit. “vitiating, decay”),<sup>14</sup> having developed from the already existing symbols in the old notation, made it possible to depict more precisely the elaborate nuances of this music. Chourmouziou, Grigorios and the latter’s students transcribed about a hundred volumes of music into the new analytical notation.<sup>15</sup> Chrysanthos’ western education must surely have influenced him to introduce the solfège type system of *paralagi* using the monosyllabic terms *ΠΑ* (pronounced pa) for the letter Α of the Greek Alphabet, *ΒΟΥ* (pronounced vou) for the letter Β, *ΓΑ* (pron. ya<sup>16</sup>) for Γ, *ΔΙ* (pron. thee) for Δ, *ΚΕ* (pron. ke) for Ε, *ΖΩ* (pron. zo) for Ζ and *ΝΗ* (pron. ni) for Η. Table 1 depicts the *martyries* of the two-octave “natural” “mild *diatonic*” or “basic” scale of Byzantine theory along with the one-to-one correspondence of its degrees with the Middle Eastern equivalents.<sup>17</sup> These new solmisation syllables replaced the old polysyllabic terms (*ananes, neanes, neheanes*, etc.), which, however, had a manifold role signifying not only a specific degree but also an interval, an *Echos* and its *apechema*.

The new *parasemantiki* has remained the same until today – the only serious attempt to modify it was that of Karas and his followers who reintroduced a number of older signs, a move that gave rise to a serious dispute. This notation system, being the culmination of a long process of evolution that lasted over a century, is a highly analytical one. Its main philosophy is on the quantitative level to numerically specify the ascending or descending melodic steps, in the frame of a certain mode-*Echos*, while at the same time determine the temporal value of these steps, and on the qualitative level to elaborately describe the way these moves have to be performed. Standard contemporary texts include ten simple and around sixty composite quantitative signs, which designate the number of degrees covered by each ascending or descending shift.

solmisation syllables (degree names)	δῖ	κε	ζω	νη	πα	βου	γα	δι	κε	ζω	νη'	πα'	βου'	γα'	δι'
Martyries															
Equivalent Ottoman-Turkish degree names	Yegah	Hüseyni Aşiran	Irak	Rast	Düğah	Segah	Çargah	Neva	Hüseyni	Eviç	Gerdaniye	Muhayyer	tiz Segah	tiz Çargah	tiz Neva

Table 1. Degree names and the *martyries* of the fundamental scale.

There are six temporal signs indicating prolongation of duration of the notes or alteration of time division as well as special signs for pauses. Even though temporal division resembles the 1, 2, 4, 8, 16 logic of Western music, actual time values are never as simple as that in practice.<sup>18</sup>

Furthermore there are six qualitative signs indicating ornamentation, phrase analysis or details in the expression depending on their position. In Table 2 the function of some of the most important signs is explained to give an idea of the structure of the system.

At the beginning of each composition we find the *arktiki martyria* (lit. “introductory witness sign”) of the *Echos*, which is used to state the modal environment of the melody, followed by a sign determining the tempo of the chant. *Martyries* of *echoi* are special signs inherited

from the old method. They contain information about the genus, the type of the *Echos* (i.e. *plagal* or *kyrios*) as well as the position of the *vasi* or the starting note of the chant on the “general” scale. In this light, their function can be seen as roughly equivalent to the declaration of the *Makam* at the very beginning of a Turkish or Arabian score.

The *martyries* of the degrees are a set of signs, one for each degree of every scale, playing a multifaceted role in this notation system. Each one of these signs consists of two parts, one on top of the other. One is the first letter of the corresponding solmisation syllable ( $\pi$  for  $\Pi\alpha, \beta$  *Bov* etc.), and the other a special sign depending on the *genus* or *chroa* this note is part of as well as its exact intonation (see Table 1). They are employed at certain points of the score to bear witness to the degree on which the melody cadences.

The Basic Signs of <i>Parasimantiki</i>			
Category	Name	Symbol	Function
The Main Quantitative Signs	<i>Ison</i>		(0) Equality or repetition of the same degree
	<i>Oligon</i>		(1) Ascending seconds, each one having its own qualitative character
	<i>Petasti</i>		
	<i>Kentimata</i>		
	<i>Kentima</i>		(+2) Ascending third
	<i>Ipsili</i>		(+4) Ascending fifth
	<i>Apostrofos</i>		(-1) Descending second
	<i>Elafron</i>		(-2) Descending third
	<i>Heporoe</i>		(-1-1) Two consecutive descending seconds
<i>Chamili</i>		(-4) Descending fifth	
Some common combinative signs			(+2) Ascending third
			(+3) Ascending fourth
			(+4) Ascending fifth
			(+5) Ascending sixth
			(+6) Ascending seventh
			(+7) Ascending eighth
	<i>Sinehes Elafron</i>		(-1-1) Two consecutive descending seconds
		(+1+1) Two consecutive ascending seconds	
Qualitative Signs	<i>Varia</i>		No quantitative or time value but complicated qualitative behavior implied
	<i>Psifiston</i>		
	<i>Omalon</i>		
	<i>Antikenoma</i>		
	<i>Sindesmos</i>		
	<i>Endofonon</i>		
Temporal signs	<i>Klasma</i>		Superadding 1 time unit
	<i>Apli, Dipli, Tripli</i>		Superadding 1,2,3 time units respectively
	<i>Gorgon</i>		Dividing one time unit in 2,3,4 notes respectively
	<i>Digorgon</i>		
	<i>Trigorgon</i>		
	<i>Hemigorgon</i>		All the above temporal signs can appear in a variety of dotted forms
	<i>Trihemigorgon</i>		
Composite temporal signs	<i>Argon</i>		Gorgon + Apli
	<i>Diargon</i>		Gorgon + Dipli
	<i>Triargon</i>		Gorgon + tripli
Silences	<i>Pause</i>		Its duration specified by the Apli, Dipli or Tripli following
	<i>Cross</i>		Breath sign of undetermined duration

Table 2. Basic signs of *parasemantiki*.

Specific alterations of the intonation of the degrees are reflected in the relevant alterations of the corresponding *martyries*, in a way that is capable of indicating modulation. As will be further explained below, the mild *diatonic genus* is the reference point of this modal system and therefore the degrees that belong to other *genera* or to *chroes* are considered altered and are called *fthorikes*. In Table 4 we can see the altered *fthorikes martyries* for the other *genera* (“tense” *diatonic*, “mild” and “tense” *chromatic*) as well as the three *chroes* (*Kliton*, *Zygos* and *Spathi*).<sup>19</sup> Careful observation of these *fthorikes martyries* reveals several symmetries of the *Octoechos* complex. Thus, in the case of the tense *diatonic* genre, we can see that the sign pattern  $\gamma \gamma \delta \gamma \eta$  is repeated revealing the periodical repetition of the same tetrachordal scheme following the *trifonia-tetrachordon systema* explained below. Furthermore, in the case of mild and tense *chromatic* genres, the sign patterns  $\rho \curvearrowright$  and  $\curvearrowleft \rho^x$  are repeated as well, revealing the periodical repetition of the same trichordal scheme, following the *omoia difonia* believed to stand for the case of *chromatic* genera.<sup>20</sup> Finally, the *martyries* of *Kliton*, unveil the use of the mild *diatonic* scheme  $\delta \gamma \eta \lambda \gamma \gamma$  transposed a major tone higher on *Πα*, revealing the *Kliton-Nisabur* logic of transposition of *Rast* tetrachord on *Dügah perde*.<sup>21</sup>

Both Chrysanthos [1821, p. 22] and the Committee of 1881 [1888, p. 43] made an attempt to further specify the intonation of the specific degrees by introducing additional symbols for flat and sharp signs. As a result the existing system today uses a special symbol for each one of 2, 4, 6, 8 and 10 *tmimata* flat or sharp as shown in Table 3.<sup>22</sup> Even though at first sight these signs seem to be equivalent to the additional flat and sharp signs of the Turkish system they are rarely used in scores but are generally employed only in theoretical descriptions of *echoi* where they serve to specify the intervals of the scale.

Sharp signs					
Alteration in <i>tmimata</i>	2	4	6	8	10
Flat signs					

Table 3. Alteration signs in *parasemantiki*.

The “school” of Simon Karas differentiated itself by using these signs extensively in scores.<sup>23</sup>

INTERVALLIC PLURALISM: A STRICTLY VOCAL TRADITION; THE ANCIENT “HARMONIC SCIENCE” AND THE “THEORY OF RATIOS”

Measuring the actual intervals used in practice has been at the heart of the research interest of theorists since the times of Pythagoreans. The long tradition of intervallic theory developed in ancient Greece was continued by Byzantine as well as Middle Eastern theoreticians who all held in high esteem the mathematical representation of intervals.

Apparently this tradition declined after the fifteenth century so that at the time of the founder of Ottoman-Turkish theory Dimitrie Cantemir, accurate descriptions of intervals seem to have gone out of fashion. A first attempt to return to mathematical precision was made by Chrysanthos in his theoretical treatise.<sup>24</sup>

The re-establishment of this aspect of modal theory was completed by the Patriarchal Committee’s announcement,<sup>25</sup> which contained the statistical results of physical measurements of the actual intervals played in practice, made by means of a monochord and the “*Ioakimeion psalterion*”, a type of organ (wind with clavier) especially made for this purpose.

Today the Aristoxenian idea of representing intervals by way of an “arithmetic” method – i.e. measuring their size by means of a reference unit/interval – has predominated worldwide over the Pythagorean “geometric” method which uses mathematical ratios. Apart from the unquestionable simplicity of all arithmetic methods as compared to geometric ones, another reason for the displacement of the latter is the introduction by Alexander Ellis<sup>26</sup> of the method of dividing the octave into 1200 cents, which being a very useful, Western-oriented tool, quickly dominated the musicological scene. By contrast, modern period Greek theorists have written much in an attempt to revive the ancient Greek tradition of mathematically detailed music treatises, making extended use of the theory of ratios.

Fthorikes Martyries										
	$\nu\eta$	$\Pi\alpha$	<i>Bou</i>	$\Gamma\alpha$	$\Delta\iota$	$\text{Κε}$	$\text{Ζω}$	$\text{Νη}'$	$\Pi\alpha'$	<i>Bou'</i>
"Tense" Diatonic	$\nu \gamma \gamma$	$\pi \delta \gamma$	$\epsilon \eta$	$\zeta \gamma \gamma$	$\Delta \delta \gamma$	$\kappa \eta$	$\zeta \gamma \gamma$	$\nu \delta \gamma$	$\pi \eta$	$\epsilon \gamma \gamma$
"Tense" Chromatic	$\nu \rho$	$\pi \curvearrowright$	$\epsilon \rho$	$\zeta \rho$	$\Delta \rho$	$\kappa \rho$	$\zeta \rho$	$\nu \rho$	$\pi \rho$	$\epsilon \rho$
"Mild" Chromatic	$\nu \curvearrowleft$	$\pi \rho^x$	$\epsilon \curvearrowleft$	$\zeta \rho^x$	$\Delta \rho^x$	$\kappa \rho^x$	$\zeta \rho^x$	$\nu \rho^x$	$\pi \rho^x$	$\epsilon \rho^x$
<i>Chroa Kliton</i>		$\pi \delta \gamma$	$\epsilon \eta$	$\zeta \lambda$	$\Delta \gamma \gamma$					
<i>Chroa Zygos</i>	$\nu \delta \gamma$	$\pi \curvearrowright$	$\epsilon \rho$	$\zeta \rho$	$\Delta \rho$					
<i>Chroa Spathi</i>				$\zeta \gamma \gamma$	$\Delta \rho$	$\kappa \eta$	$\zeta \gamma \gamma$	$\nu \delta \gamma$		

Table 4. *Fthorikes martyries*.

The first concern of theoreticians has always been the definition of the so-called “natural”, “basic” or “mild” *diatonic* octave scale depicted on Table 1, whose primary role will be explained below. Using as a starting point the degree  $\nu\eta$  (corresponding to *Rast perde*<sup>27</sup>), the ambiguity has always been related to the intonation of the third degree *Bov* (*Segah perde*) and the seventh *Zω* (*Eviç perde*), since the rest are all agreed to be tuned to the Pythagorean major tone (9/8), minor third (32/27), natural fourth (4/3), fifth (3/2) and major sixth (27/16)<sup>28</sup>. Starting with the reform of 1820s, Chrysanthos suggested 12/11 as the predominant *diatonic* minor second for the intervals *Πα-Bov* (*Dügah-Segah*), *Κε-Zω* (*Hüseyni-Eviç*) and  $\zeta\omega-\nu\eta$  (*Irak-Rast*) degrees,<sup>29</sup> an interval closer to the Arabian aesthetics placing these neutral tones on the quartertones (12/11 = 151 cents) and the resulting thirds (e.g.  $\nu\eta$ -*Bov* or  $\Delta\iota$ -*Zω*) on the Zalzalian geometric means (27/22 = 354.55 cents). The Committee of 1881, with the help of leading practitioners and the use of a measuring instrument, came down with some interesting suggestions like the *diatonic* major third 100/81 (= (10/9)\*(10/9))<sup>30</sup> that is one comma lower than the Didymian<sup>31</sup> 5/4, the resulting *diatonic* minor second 800/729 (100/81 ÷ 9/8) and the remaining semitone completing the *diatonic* tetrachord 27/25 (= (9/8)\*(24/25))<sup>32</sup>. Other authors such as Hatziathanasiou<sup>33</sup> and Efthimiadēs<sup>34</sup> stuck to the so-called Pythagorean and Didymian suggestions, proposing the just *diatonic* major third 5/4 for the above cases. The next major contribution in this direction is Karas’s extended analysis<sup>35</sup> which brought back intervals first suggested by ancient theorists such as Archytas, Didymos, Claudios Ptolemaios, Zalzal or (al-) Fārābī and recommended among others the division 9/8-54/49-784/729 for the mild *diatonic* tetrachord. His follower Lykouras, who published a highly mathematical survey which not only summarizes the contributions of Greek and medieval Arab and Persian theoreticians in the subject but further extends them as well, argued that the main minor tone used in Greek music is 11/10.<sup>36</sup>

These suggested values for the intervals *Πα-Bov* and *Κε-Zω* present a large deviation ranging from the three quarter neutral tone 12/11 (151 cents) to the minor tone 10/9 (182 cents). Besides the normal deviation due to stylistic diversities among chanters from different areas or schools, or the variations depending on the different scholars’ measuring or estimation methods, the most important reason is probably the special role these two degrees play in the development of all *diatonic* melodic movements. This role, which is connected to the phenomenon of “melodic attractions” and will be further clarified below, demands that these two degrees (*Bov* and *Zω*) are highly mobile. Due to the high fluidity of intonation in this tradition, all the suggestions concerning intervals refer to their “nominal values” and should be conceived as defining the “reference” or “equilibrium”

positions of the degrees involved, around which the latter deviate depending on the melodic context.<sup>37</sup> Apart from the intonation of the aforementioned ambiguous degrees, the researchers’ attention focused also on the relative position of the degrees of *chromatic* or *enharmonic* intervallic arrangements, some of which will be presented in the following section.<sup>38</sup>

It was Chrysanthos again who introduced the arithmetic representation of intervals assigning 12 *tmimata* (lit. “parts”) to the major tone in accordance with Cleonidēs’ *dodekatimoria*.<sup>39</sup> The rest of his choices though, such as that of the 68 *tmimata* for the octave, 9 for the 12/11 and 7 for the 88/81 neutral seconds, do not constitute a mathematically consistent system and were rejected by most subsequent scholars including the Patriarchal committee. The latter’s more methodical and scientifically oriented work on this subject, resulted in a system dividing the octave into 36 parts assigning 6 to the major tone, 5 to the minor and so on. A combination of the two is the standard arithmetic system used in contemporary Byzantine music theory – already explicitly described by Cleonidēs in the second century (?) A.D.,<sup>40</sup> dividing the octave in 72 *dodekatemoria* – i.e. one twelfth of a major tone – assigning 12 *dodekatemoria* (or *tmimata* as they are called today) to the major tone, 10 to the minor and 8 to the so-called “least” tone. This arithmetic system served as a symmetric and pedagogical tool that inevitably dominated everyday communication between practitioners. A few scholars questioned its accuracy, among who were Misaelidēs<sup>41</sup> and Karas<sup>42</sup>. The latter trying to correct the misleading picture this system gives for several intervals such as the Pythagorean *lemma* – which being assigned the value of 6 *tmimata* (exactly half of 12) is erroneously confused with the Western equal-tempered semitone – used non-integer numbers like the 5 ½ or the 7 ½ and provoked numerous negative reactions among Byzantine music specialists. The exact calculations of the arithmetic values of the most frequently mentioned intervals can be seen in Table 5 where their values are presented in three arithmetic systems, dividing the octave in 72 (Byzantine *tmimata* or *dodekatimoria*), 53 (Mercatoric commas) and 1200 equal parts (A. Ellis’s cents) respectively.

#### TETRACHORDS, PENTACHORDS, AND THEIR CATEGORIZATION IN GENERA<sup>43</sup>: THE “MILD” AND “TENSE” DIVISIONS OF DIATONIC AND CHROMATIC GENERA

Next step after the level of intervals is their smallest combinations-arrangements in sets of three or four consecutive, building up the so-called “subunits” of musical scales known as *tetrachords* and *pentachords*. This idea, which first developed in ancient Greece<sup>44</sup>, has been broadly used in the modal systems of Persians, Arabs,

Turks and Indians.<sup>45</sup> *Tetrachords* and *pentachords* (lit. “four-stringed” and “five-stringed” respectively<sup>46</sup>) most probably owe their names to the sets of four or five consecutive strings of harp-type instruments widely used in the entire ancient world, tuned to the successive degrees of a scale subunit. In Greek-Byzantine theory they have always been conceived as arrangements of four or five consecutive notes such that their upper and lower boundaries are a perfect 4<sup>th</sup> and 5<sup>th</sup> apart, in contrast with the equivalent system of *dörtliisî* in Turkish theory where they can also be “incomplete”.<sup>47</sup>

The concept of *genus*, which is an important aspect of modern Byzantine chanting theory, provides a classification of tetrachordal and pentachordal units according to the type of intervals they employ, in accordance with the ancient definition of *genus* given by Aristidēs Kointilianos.<sup>48</sup>

Dividing a set of entities into *genera* is a long-standing tradition in Greek music theory, applied to a variety of aspects such as tetrachords, scales, modes, as well as rhythms and genres.<sup>49</sup>

Although the use of the *genus* concept had never been entirely abandoned, Chrysanthos and Stefanidēs are responsible for returning the division into *genera* to a conspicuous position. Karas gives a definition of *genus* as “a set of musical modes that employ the same or similar intervals constituting a family or modal class”.<sup>50</sup> This categorization in terms of types of intervals used, is most applicable at the level of tetrachords and pentachords, while on the higher level of scales and *echoi* we have many composite instances employing intervals from more

than one *genus*. According to this ancient theory, the theoretically infinite ways of dividing the tetrachord into three intervals fall into three general categories, the *diatonic*, the *chromatic* and the *enharmonic genus*, while the first two *genera* can be further divided in various subcategories called *chroes*.<sup>51</sup> Modern explanations<sup>52</sup> following the latter division separate the *diatonic* and the *chromatic genera* into two subcategories, the “mild” and the “tense”.

The “mild” *diatonic* is considered the foundation of the whole modal system providing with the “basic” or “natural” scale, which generates the primary modal entities. It employs all three categories of tones (“major”, “minor” and “least”) in every tetrachord while the “tense” *diatonic* uses only “major” tones and Pythagorean *lemmas* (for details on the intervals see the catalogue given by Table 5)<sup>53</sup>. As already mentioned above, the prevailing opinion on the “nominal” values of the intervals employed by the mild *diatonic* genus is the one suggested by the Patriarchal “Musical Committee” which given in Byzantine *tmimata* (B.T.) assigns 12 to the major tone, 10 to the minor one and 8 to the least. The approximate values in Mercatoric (M.C.) commas<sup>54</sup> are 9, 7 and 6 respectively.<sup>55</sup>

It is worth citing here the corresponding suggestions of Chrysanthos: In the arithmetic method he suggests 12, 9 and 7 in *tmimata* corresponding to 9, 6.75 and 5.25 in M.C., being though inconsistent with his frequency-ratio values in the geometric method, which given in commas they roughly correspond to 9, 6.5 and 6.5.

Catalogue of the most popular intervallic ratios and their arithmetic values in 3 systems				
	Geometric Method	Arithmetic Methods		
	Frequency Ratios	Merkatoric commas	Byzantine <i>tmimata</i>	cents
Octave	2/1	53	72	1200
Fifth	3/2	31	42.18	702
Fourth	4/3	22	29.88	498
Major third "Ditone"	81/64	18.01	24.47	408
Just or "mild" diatonic major third	5/4	17.06	23.17	386
"Zalzalian" mean	27/22	15.66	21.27	355
Just "diatonic" minor third	6/5	13.94	18.94	316
Pythagorean minor third	32/27	12.99	17.65	294
Enharmonic minor third	7/6	11.79	16.01	267
"Hypermajor" tone	8/7	10.21	13.87	231
Major tone	9/8	9.01	12.23	204
Minor tones	10/9	8.06	10.94	182
	65536/59049	7.97	10.83	180
"Neutral" tones	54/49	7.43	10.09	168
	11/10	7.29	9.9	165
	800/729	7.11	9.65	161
	12/11	6.65	9.04	151
	13/12	6.12	8.31	139
"Least" tones	27/25	5.88	7.99	133
	14/13	5.67	7.7	128
	15/14	5.27	7.17	119
<i>Apotome</i>	2187/2048	5.02	6.82	114
Major semitone	16/15	4.93	6.7	112
Pythagorean <i>Lemma</i>	256/243	3.98	5.41	90
Enharmonic semitones	25/24	3.12	4.24	71
	28/27	2.78	3.78	63
"Didymian" comma	81/80	0.95	1.29	22

Table 5. Interval ratios and their values in three arithmetical systems.

Furthermore, the suggestions of Misaelidēs are 12, 11 and 7 in *tmimata* corresponding to 9, 8 and 5 in Mercatoric commas which are practically identical to the intervals of the *Rast* tetrachord of contemporary Turkish theory.<sup>56</sup> Beginning with the “mild” *diatonic* tetrachords we can observe that the three possible schemes of intervallic arrangement are derived by a cyclical shift of the basic series major tone-minor tone-least tone (equivalent to *Rast* tetrachord)<sup>57</sup>, or 12-10-8 in *tmimata* (9-7-6 in commas). In this manner we get for the other two the orders: minor tone-least tone-major tone (equivalent to *Uşşak*) [10-8-12 in B.T. or 7-6-9 in M.C.] and least tone-major tone-minor tone (8-12-10 in B.T. or 6-9-7 in M.C. equivalent to the Turkish *Segah*). Similarly for the “tense” *diatonic genus* the three schemes are a) Pythagorean *lemma*-major tone-major tone (6-12-12 in B.T. or 4-9-9 in M.C. equivalent to *Kürdi* tetrachord), b) major tone-*lemma*-major tone (12-6-12 in B.T. or 9-4-9 in M.C. equivalent to *Buselik*) and c) major tone-major tone-*lemma* (12-12-6 in B.T. or 9-9-4 in M.C. equivalent to *Çargah*).

By contrast, the *chromatic genus* is defined as the one employing intervals larger than the major tone.<sup>58</sup> In the “mild” *chromatic genus* these augmented seconds are smaller than the ones used in the “tense” *chromatic genus*. Karas further elucidated this classification by showing how mild *chromatic* tetrachords derive from the mild *diatonic* ones and tense *chromatic* by tense *diatonic* ones respectively, by means of the change of only one interval.<sup>59</sup> Table 6c contains the committee’s suggestions for the “mild” and “tense” *chromatic* tetrachords, given both in *tmimata* (B.T.) as well as their rough approximations in Mercatoric commas (M.C.), which are more or less still accepted as indicative of the difference between the two *genera*.

B.T.	12	9	7
M.C.	9	6,75	5,25

1<sup>st</sup> scheme “mild” diatonic suggested by Chrysanthos (Arithmetic method)

M.C.	9	6,5	6,5
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1<sup>st</sup> scheme “mild” diatonic suggested by Chrysanthos (Geometric method)

B.T.	12	11	7
M.C.	9	8	5

1<sup>st</sup> scheme “mild” diatonic suggested by Misaelidēs

B.T.	12	10	8
M.C.	9	7	6

1<sup>st</sup> scheme “mild” diatonic suggested by the “Musical Committee”

Table 6a. The 1<sup>st</sup> scheme “mild” diatonic tetrachord corresponding to Turkish theory *Rast dörtlusu*.

B.T.	10	8	12
M.C.	7	6	9

Table 6b. The 2<sup>nd</sup> scheme “mild” diatonic tetrachord corresponding to Turkish theory’s *Uşşak dörtlusu* according to the Musical Committee’s intervallic suggestions.

B.T.	6	20	4
M.C.	4	15	3

B.T.	8	14	8
M.C.	6	10	6

Table 6c. “Tense” (upper) and “Mild” (lower) *chromatic* tetrachords as suggested by the “Musical Committee”.

Comparing them with the Turkish *Hicaz* tetrachord we can assume that the distinction between two different types of *chromatic genera* in Byzantine theory pushed both types of tetrachords to the limits, the “tense” one having a very large augmented second while the “mild” a very small one.

In the case of the *enharmonic genus* the situation is somewhat more problematic. In ancient Greek theory this *genus* employed two intervals of the size of a quartertone and one very large augmented second to complete the tetrachord.<sup>60</sup> In this sense the *enharmonic genus* has not fully survived in modern theory. However, practitioners and theoreticians<sup>61</sup> attest the existence of melodic passages employing intervals smaller than the Pythagorean *lemma* named “enharmonic *dieseis*” or “enharmonic semitones” (approximately 4 *tmimata* or 3 Mercatoric commas) combined with hyper-major (approx. 14 *tmimata* or 10 commas) and major-tones. The resulting tetrachords described in the arithmetic methods consist of combinations of 4, 14 and 12 *tmimata* (3, 10 and 9 in M.C.) in different order. Chrysanthos used such an intervallic configuration to explain 3<sup>rd</sup> *Echos* (hyper-major tone, enharmonic semitone, major tone)<sup>62</sup> while the Patriarchal “Musical Committee” interpreted the raised *Bov* employed in this case (one comma higher from *Buselik perde*) as a temporary alteration due to melodic attraction existing only in ascending movements.<sup>63</sup> In both cases the particular melodic behaviour was, though, named *enharmonic* while Misaelidēs<sup>64</sup> suggested the term *armonikon* (lit. “harmonic”) to underline its partially enharmonic character since it contains only the small intervals and not the large augmented seconds of the ancient enharmonic *genus*. The distinction between the marginally different arrangements described above and that of the tense *diatonic* configurations (combinations of 4 and 9 commas in different order) has created much confusion.<sup>65</sup> Nowadays the predominant tendency seems to be the utilisation of the term *enharmonic* for specific cases where these particularly small semitones are used to give a temporary *enharmonic* quality such as the raising of *Bov*

(*Buselik perde*) towards cadencing on Γα (*Çargah perde*) or the lowering of Ζω ς (*Acem perde*) in descending phrases towards Δι (*Neva perde*) or the *chroes* which make extensive use of the “enharmonic semitones” as further described in Table 8.

THE GENERAL SCALE FOR EACH GENUS AND ITS IMPORTANCE IN PARASEMANTIKI NOTATION

Tetrachords and pentachords, as scale subunits, can be combined in many different ways to construct octave species and even more the *dis-diapason* two-octave species, considered to be the adequate range for such a case of vocal tradition.<sup>66</sup> Even though as we mentioned above, the concept of genera categorization applies better at the level of tetrachords and pentachords, tradition and notation conventions accept one specific two-octave general scale as the default scale for each genus.<sup>67</sup> This means that after an *arkitiki martyria* introduces a melody operating in a specific genus, the general scale of that genus serves as the default two-octave intervallic framework on which this melody moves on, until a modulation sign appears.<sup>68</sup> This is very crucial for this kind of notation system since the quantitative signs here do not carry any information about the intonation of each degree, like in the case of Western staff notation. Thus the ascending and descending movements signified by the quantitative *parasemantiki* signs, are being performed by remaining in the frame of each genus’ general scale. The existence of these general scales for the different *genera* is a very similar concept with the 10 different *Thaat* general scales of Hindustani *Rāga* modal system.<sup>69</sup>

Furthermore the construction of these scales is explained by means of the algorithmic concept of *systemata*, another Ancient Greek idea<sup>70</sup> emphasized by Chrysanthos.<sup>71</sup> The main initiative behind the modern concept of *systema* (lit. “system”, “method”) is the definition of an algorithm for building up a scale by repeating the same structural unit, one on the top of the other. The three basic *systemata* in modern Byzantine theory are the *tetrachordon* or *trifonia* in which the scale is built up by repetition of the same tetrachord, the *pentachordon* or “wheel” where the repeated unit is a pentachord and the *octachordon* or *diapason* in which an octave unit is used.<sup>72</sup> In the latter *systema*, this octave unit is constructed by one major tone and two tetrachords, which are either conjunct with the tone on the top or the

bottom, or disjunct with the tone in between.<sup>73</sup> Table 7 displays a “mild” *diatonic* scale constructed in the three different *systemata*, showing the divergence between them. Traditionally, the mild *diatonic genus* develops mainly in the *octachordon systema* creating the celebrated, “basic” or “natural” scale (equivalent to *Rast* scale), which serves as the reference point of the *Octaechia* system; the tense *diatonic genus* follows the *tetrachordon systema* while the mild and tense *chromatic* ones for the most part employ the *pentachordon systema*, although there are exceptions to all these rules.

THE PHENOMENON OF “MELODIC ATTRACTIONS” AND THE PRACTICE OF ISOKRATIMA

As a purely vocal tradition that doesn’t hitch on instrument’s fretting, Byzantine chanting presents a very elaborate treatment of the intervals. The theoretically limitless freedom of a vocal rendering in matters of intonation, along with the monotonic structure of this music, have probably been the main reasons for the formation of complex melodic rules governing the treatment of certain degrees that traditionally are accepted as elastic in intonation. In contemporary theory the phenomenon of “melodic attractions” is being perceived as the result of the attraction of the strong-immovable degrees of the mode on the weak-movable ones.<sup>74</sup>

This relocation of degrees is determined by their intervallic relations with the tonal centres and the cadencing point as well as the direction of each specific melodic phrase, taking of course into account the overall modal environment.<sup>75</sup> Although Chrysanthos<sup>76</sup> and Apostolos Konstas<sup>77</sup> discuss the modification of the intonation of certain degrees depending on the ascending or descending direction of each melodic phrase, the Committee of 1881 was the first to explicitly refer to the phenomenon of “melodic attractions” in the modern era. According to them, the degrees are divided into two categories, the “dominant” (*despozontes*) and the “surpassable” (*hyperbasimous*), the first of which are stable and the second of which are subject to alterations called “attractions” (*elxeis*)<sup>78</sup>. The members of the “Musical Committee” consider that this is a natural phenomenon, which musical practice preserved by passing it orally from one generation to the other, even though the theoretical treatises never analysed it.

	δι	κε	ζω	νη	πα	βου	γα	δι	κε	ζω	νη	πα	βου
<i>octachordal</i>	12	10	8	12	10	8	12	12	10	8	12	10	
<i>pentachordal</i>	10	8	12	12	10	8	12	12	10	8	12	12	
<i>tetrachordal</i>	12	10	8	12	10	8	12	10	8	12	10	8	

Table 7. The “mild” diatonic *genus* in three *systemata*.

The older generation of Istanbul chanters-theoreticians such as Stefanos Domestichos, Panayiotis Kiltzanidēs and Apostolos Konstas, who were all acquainted with Ottoman classical music and instruments, tried to explain the phenomenon of “melodic attractions” by specifying the corresponding Ottoman *tanbur nim-perdeleler* for the different altered degrees used in typical melodic phrases of Byzantine chanting.<sup>79</sup> Nevertheless, the phenomenon is not restricted to the discrete substitution of a higher degree-*perde* with a lower one but is in fact a continuous bending of a degree in the direction of the melody flow. As an anonymous writer of the past said, “the voices (degrees) are moving, like a flowing river”<sup>80</sup>. Karas stresses that “it is with these slides... and ornaments that a monophonic music displays its beauty”.<sup>81</sup> Some of the most striking alterations – especially the ones which signal a modulation – are specifically notated in the new *parasemantiki*. Recent scholars aimed to give a more accurate picture of the phenomenon. Karas<sup>82</sup>, Efthimiadēs<sup>83</sup>, and Kostantinou<sup>84</sup> all try to signify most of the “hidden” attractions by means of the special signs introduced by the “Musical Committee” for sharpening or flattening a note by 2, 4, 6, 8 or 10 *tmimata* (see Table 3 above). This approach, introduced by Psahos at the beginning of the twentieth century<sup>85</sup>, is still not widely accepted since most teachers and practitioners believe that the old method of relying mostly on oral transmission and not so much on the accuracy of the scores, is superior. The most ambitious among the attempts to investigate the phenomenon of melodic attractions is the book of Katsifis<sup>86</sup>, which deals only with this subject. This author claims that by means of a self-constructed measuring instrument, he confirmed most of these small but important pitch alterations in this music. Taking as reference the standard values for the intervallic relations between the degrees of each mode, he provides long and detailed descriptions of the minute pitch alterations for 17 basic and derivative *echoi*. Another serious endeavour to explicate the possible intervallic arrangements in *diatonic Varys Echos*, a case famous for containing many melodic attractions, was made by Vetsos.<sup>87</sup>

Continuous *ison* or *isokratima* (lit. “drone keeping”) plays a very important role in Byzantine chanting tradition. The main chanter is usually accompanied by one or more *isokrates* or *vastaktes* (drone keepers) while there are cases where a bigger chorus is divided into a group of soloists and a group of *isokrates*. The old tradition of *isokratima* seems to have been based on some simple ideas and even though it is mentioned as playing a very important role in chanting practice, it is not particularly analysed in the old theoretical treatises. It is described as keeping the main tonal centre of the melody which most of the time coincides with the *vasi* (lit. “ground”) reference note of the mode, the bottom end of the lower tetrachord.<sup>88</sup> The nineteenth century brought Western

ideas in drone keeping practice, and the simplicity, solemnity and stability of the old aesthetics were replaced by a much bigger variety and mobility of the *ison* employing ideas from Western harmony. Subsequent scholars reproved these innovations as being unnecessary and irrelevant to this music.<sup>89</sup>

The basic rule of keeping the *ison* at the *vasi* of the *Echos* is contravened at points where the melody insists on notes which are at dissonance with it as well as at points where the melody drops below this *vasi*. At these points the drone follows the melody usually an octave lower (if this is feasible considering the pitch of this degree). A more complete form of *ison* requires a second drone, which shows a slightly higher mobility following or reflecting the temporary shifts of the melodic centre.<sup>90</sup> The *vasi* drone is dropped completely or substituted in modulations that change the reference note. At this point lies one of the most important roles of the continuous drone presence in this music. This judiciously movable drone is responsible for presaging as well as preparing the ground for all modal variations. From the imperceptible to the most distinct modulations, they all rely upon drone support to create the appropriate atmosphere to justify their existence. The humble art of the *isokratias* in Byzantine chant consists of his preparedness to foreshadow all these nuances of this music. This is managed by his looking forward in the score for these alterations and being ready to underline them – in cases where notation is used – or by remembering every one of them in situations where chant is performed by heart.<sup>91</sup> One of the important features of this movable drone is the fact that it triggers as well as supports and justifies the above mentioned melodic attractions, which under the presence of *isokratima* seem to arise as a result of “natural harmony”.<sup>92</sup>

## RHYTHM AND FORM

The idiomorphic phenomenon of “tonic rhythm”, used in Byzantine chant, derives from the dominance of the poetic text on music setting, as stated above. As a result there are no standard repeated rhythmic patterns functioning as the frames of compositions. Instead of the ordinary organization of time in cycles, the dynamic emphasis of the melody follows the accentuation of the text. At certain parts the chanting follows a stable tempo, and metres of 2, 3, 4 time units (among which the 4 beat cycle is the one most frequently found) succeed one another in a manner that depends entirely on the metric schemes of the poetic text.<sup>93</sup> Chrysanthos’ introduction of bar metres<sup>94</sup> along with the accurate specification of the time duration of signs followed by the “Musical Committee(’s)” metronomic specification of tempo, contributed to the raising of the old method’s rhythmic obscurity commented upon by Cantemir in his theoretical treatise.<sup>95</sup>

Morphological analysis consists of a classification of the compositions in *eidei* (*eidos* lit. “kind”, “genre”), according to the type of the hymn, its performance tempo and the number of time units each syllable of the text occupies. *Eirmologikon eidos* – the most ancient one – is the category of compositions in which whole groups of hymns share the same melody, and it contains short pieces played in fast tempo where each syllable extends for 1 or 2 time units. The *sticherarikon eidos* compositions are by contrast all unique in that they mostly contain the “moderately short” pieces where each syllable extends for 2 up to 4 time units (in the case of old *sticherarikon* it can reach up to 8). The *papadikon eidos*, being the last developed, consists of slow compositions in which the syllables of the text cover a large number of time units. The interpretation of such compositions traditionally allows considerable freedom for the performer both in matters of temporal as well as melodic analysis<sup>96</sup> of the phrases.<sup>97</sup>

Although *eidos* is not a modal characteristic, it plays an important role in the modal behaviour of a chant. For most *echoi*, the modal characteristics are quite different, depending on the *eidos* of the chant. In that sense the categorization in *echoi*, which will be presented below, is not based only on modal criteria but also on morphological points which in turn depend on the content and metric form of the poetic text, as well as the tempo of its usual performance. Thus the organization in eight *echoi*, named as *Octoechos* or *Octaechia*, is not strictly a modal system like the case of Arabian and Turkish *Makams* or the Indian *Rāgas*, but rather a “semi-modal” organization of the repertoire, like the *Dastgah* system of the Persian classical music.<sup>98</sup>

#### THE “SEMI-MODAL” COMPLEX OF *OCTAECCHIA* AND THE CONSTITUTIVE CHARACTERISTICS OF ITS ENTITIES

The old form of *Octoechos* was an original descendant of the ancient hierarchical and symmetrical closed-ended modal systems tradition<sup>99</sup> of the great civilizations that flourished in the area between Eastern Mediterranean, Central Asia and the Indian subcontinent.<sup>100</sup>

The structure of *Octoechos* complex, having a set of “primary” and a set of *plagal* (lit. “oblique”, “collateral”) “subordinate” *echoi*, is similar to the structure of the old eastern modal systems, such as the 7 “royal” modes of the Persian system of the Sassanid era, the eight modes of the Arabian system of the Umayyad era,<sup>101</sup> the post- Ibn Sina (10<sup>th</sup> century) series of 12-mode modal systems named as *Shed*, *Pardah*, *Makam* or *Nagnah* (primary modes) and *Avaz*, *Sho’ba*, *Gushe* (secondary subordinate modes), or even the Indian system of 6 primary *Rāgas* each one having 5 subordinate *Rāginis*.<sup>102</sup>

The theoretical model of the generation of the *echoi* and their relative position on the “basic” scale is of vital importance in understanding the structure of the *Octoechos* complex. The original position of the 4 *kyrioi* (primary) *echoi* in the old *Octoechos* was on the upper tetrachord *Ke-Πα’* of the “basic” scale<sup>103</sup> while the corresponding *plagal* ones were placed a fifth lower on the tetrachord *Πα-Δι*. Consequently the numbering of the *plagal echoi* would start from the first degree of the “basic” scale *νη* while that of the *kyrioi echoi* a fifth higher from *Δι*, both developing along the notes of the basic *diatonic* tetrachordal configuration major tone-minor tone-least tone-major tone (corr. *Rast* pentachord).<sup>104</sup> Therefore, the *vasi*-finalis of the four primary *echoi* were *Ke* (1<sup>st</sup> *Echos*), *Zω* (2<sup>nd</sup>), *Νη* (3<sup>rd</sup>), *Πα’* (4<sup>th</sup>), *Πα* (1<sup>st</sup> *plagal*), *Βου* (2<sup>nd</sup> *plagal*), *Γα* (3<sup>rd</sup> *plagal*), *Δι* (4<sup>th</sup> *plagal*).<sup>105</sup>

A series of reasons was responsible for the rearrangement of this scheme whose transformation resulted in the configuration first introduced by Chrysanthos in his theoretical treatises. As was the case for many perfectly symmetrical modal systems produced in the history of Middle Eastern music theory, practice did not always obey these models. Due to difficulties in performing the compositions in the high register, the *vasi* of the 4<sup>th</sup>, 3<sup>rd</sup>, and *plagal* of 4<sup>th</sup> were transposed a fifth lower on *Δι* (*Neva perde*), *Γα* (*Çargah perde*) and *Νη* (*Rast perde*) respectively.<sup>106</sup> For a strictly vocal tradition where instruments were only used as pedagogical and research tools, the absolute pitch of a performance did not have the same meaning and importance as in instrumental genres. Moreover the above-mentioned “transpositions” of the *vaseis* of these *echoi* were also dictated by the austere and solemn aesthetics of this music.<sup>107</sup> Another factor that seems to have influenced the relative positions of the modal entities of the *Octoechos* complex is the long interaction of Byzantine chant with Ottoman-Turkish classical music and its instruments, which played an exceptional role as teaching-researching aid in the hands of many of the leading chanters and theoreticians in the history of this music. It is most probable thus to consider the transposition of the modes 1<sup>st</sup>, 2<sup>nd</sup> and *plagal* of 2<sup>nd</sup> to fit the finalis of the corresponding *Makams* (*Uşşak*, *Hüzzam*, *Hicaz*, respectively)<sup>108</sup> as an indirect result of this interaction.

Besides these rearrangements of the basic organization scheme of 4 *kyrioi* - 4 *plagal echoi*, the contemporary *Octoechos* complex distinguishes the different modal morphemes into a big number of distinct cases based on a series of modal structural characteristics which are similar to the corresponding ones found in Turkish and Arabian *Makams*, Persian *Dastgah* or Hindustani *Rāgas*. Thereby, the scheme is devised in many types of derivative *echoi*, depending on complex modal behaviour reminiscent of the *Seyir* (melodic progression)<sup>109</sup> of composite *Makams*, producing the so-called *mesoi*, *paramesoi*, or *difonoi*, *trifonoi*, *tetrafonoi*,

*pentafonoi* etc. *echoi*. According to Apostolos Konstas Chios, these subordinate branches of the main *echoi*, reached the total number of distinguishable modal entities of *Octoechos* to 90.<sup>110</sup>

Contemporary theory analyzes *echoi* by means of some basic characteristics. The *vasi* is the first one of them, which is considered as the degree of the “basic” scale that “generates” the specific *Echos*, normally playing the role of the basic reference-drone as well as that of the finalis of the *Echos*. The scale employed, the *genus*, in which it belongs and the *systema* by means of which this scale is constructed, are the next aspects characterizing an *Echos*. The hierarchy of the degrees of the mode – a crucial feature of the system – is based on two concepts, firstly their temporal dominance and secondly their role as cadencial stops. *Despozouses* (lit. “dominant degrees”) are the notes that are distinguishable due to their frequency of appearance as well as their relative duration. *Katalixeis* (cadencial stops) are the degrees on which the particular *Echos* prefers to rest. In most cases the *despozouses* coincide with some of the prominent *katalixeis* of the *Echos*. Byzantine theory distinguishes between three types of stops depending on the importance, duration and position of the specific cadence in the progression of the melody. In this manner we have *ateleis*, *enteleis* and *telikes katalixeis* meaning “provisional”, “intermediary” and “final” stops respectively, in full correspondence with the punctuation of the text by means of comma, semicolon and full stop. For each one of these types of *katalixeis* there are characteristic melodic phrases cadencing on these degrees, called *theseis*, which are typical for each *Echos*.<sup>111</sup> Panagiotopoulos presents extended catalogues of such *theseis* for each *Echos* and its most common derivatives.<sup>112</sup>

Important elements of an *Echos* are the signifying *arkitiki martyria* (already explained above), the *apechema*, the distinctive “melodic attractions” happening in the framework of the specific mode, the ordinary ambitus as well as the typical modulations of the specific *Echos*. *Apechema* (pl. *apechemata*), which is automatically performed by the chanters even though not included in the scores, is a short introductory melody serving to create the appropriate modal atmosphere before the performance of the composition begins.<sup>113</sup> Nowadays the *apechemata* have become very short, though most contemporary theory books include their long versions of the “old method”.<sup>114</sup> The *ethos* is usually discussed last by all the authors, since it is not a technical aspect of the melody, but more of a way of describing its characteristic atmosphere. Although three general types of *ethos* are accepted – identical with those referenced by Cleonides<sup>115</sup> – the *diastaltiko* (“dilating” or “elevating”) the *syntaltiko* (“contracting” or “depressing”) and the *hesyastiko* (“calming” or “soothing”), the case of each *Echos* is portrayed by means of a more descriptive terminology.<sup>116</sup>

## A CONCISE PRESENTATION OF THE MAIN ENTITIES OF *OCTOECHOS*<sup>117</sup>

### 1<sup>st</sup> Echos<sup>118</sup>

Its *vasi* is *Πα* for the case called “inner”, and *Κε* for the case called “outer”. Both use the mild *diatonic* scale developing in the *octachordon systema*, consisting of two disjunct tetrachords of the type minor-least-major tone, even though in some instances the *pentachordon systema* is also employed. In the case of *εirmologikos* “inner” 1<sup>st</sup> *Echos* the dominant degrees (*despozontes*) are *Πα* and *Δι* and the provisional stops (*ateleis katalixeis*) are on *Δι* and *ζω* while the intermediary and final stops (*enteleis* and *telikes katalixeis* respectively) are made on *Πα*. For *sticherarikos* “inner” 1<sup>st</sup> *Echos*, dominant degrees are *Πα* and *Γα*, provisional stops on *Γα* and *Δι* and intermediary and final stops on *Πα*. *Papadikos* “inner” 1<sup>st</sup> *Echos* uses *Πα*, *Γα*, *Δι*, *Κε*, *Πα'* as dominant degrees, provisional stops on *Πα*, *Γα*, *Δι*, *Κε* and intermediary stops on *Πα*, *Δι*, *Κε* and final on *Πα*. In the case of “outer” 1<sup>st</sup> *Echos* with *vasi* on *Κε* we have dominant degrees on *Κε* and *Νη*, provisional stops on *Πα*, *Γα*, *Δι*, *Κε*, *Νη* *enteleis* on *Πα* and *telikes* on *Κε*. Explicitly referred to is the case insisting on *Γα* while lowering *Δι*, named 1<sup>st</sup> *Echos* *diphonos* or “naos” or “pathetikos”. Among the usual modulations are the *kliton* and the tense *chromatic* on *Πα*. In Ottoman-Turkish *Makam* language we could say that “inner” 1<sup>st</sup> *Echos* corresponds to the *Uşşak-Beyati* family, including as its different cases *Neva*, *İsfahan* or *Saba* as well. The case of “outer” 1<sup>st</sup> *Echos* on *Κε*, though, is like a *Hüseyni* ending on the homonymous *perde*.

### 2<sup>nd</sup> Echos<sup>119</sup>

Two different branches can be distinguished in the case of this *Echos*, the first employing the mild and the second the tense *chromatic* scales, both built by means of the *pentachordon systema*. The first is used in the *sticherarikon* and *papadikon eidos* while the second in the *εirmologikon*, even though there are alternations between the two. The mild *chromatic* 2<sup>nd</sup> *Echos* uses *Δι* as its *vasi*, *Βου* and *Δι* as its dominant degrees, *Δι*, *Βου*, *Ζω* and *Νη* and as its temporary stops, *Βου* and *Δι* as its intermediary ones and mainly *Δι* but also *Βου* as its finalis (in the latter case it is named *mesos* of the 2<sup>nd</sup>). For the tense *chromatic* case, which actually behaves as a 2<sup>nd</sup> *plagal Echos* (see below), the *vasi* is *Πα*, the dominant degrees are *Πα* and *Δι*, and provisional stops are always made on *Δι* while intermediary and final ones on *Πα*. The mild *chromatic* – i.e., the 2<sup>nd</sup> *Echos* – is related to *Makam Hüzzam* though its final cadence is more often on *Δι* (*Neva*) than on *Βου* (*Segah perde*). Furthermore, whenever the latter mode descends to *νη* (*Rast perde*) another mild *chromatic* pentachord is employed from *νη* to *Δι*. A derivative *Echos*

combining the 1<sup>st</sup> and mild *chromatic* 2<sup>nd</sup> *echoi* is the one called *defteroprotos* which is very similar to *Makam Karciğar*.

### 3<sup>rd</sup> Echos<sup>120</sup>

This *Echos* has  $\Gamma\alpha$  (*Çargah perde*) as its *vasi* and develops mostly on the tense *diatonic genus* working in the tetrachordon *systema*, although it follows the mild *diatonic genus* at certain points of its melodic progression. For the *airmologikon* and *sticherarikon eidos* dominant degrees are  $\Pi\alpha$ ,  $\Gamma\alpha$  and  $K\epsilon$ , provisional and intermediate stops are made on  $\Pi\alpha$  and  $K\epsilon$  and final ones on  $\Gamma\alpha$ . From the point of view of *Makam* theory this *Echos* resembles the theoretical *Çargah Makam* introduced by the Ezgi-Arel system; it is also reminiscent of the *Acem Aşiran* melodic atmosphere. The case of 3<sup>rd</sup> *Echos* in *Papadikon eidos* follows the melodic characteristics of 4<sup>th</sup> *plagal*, as this will be explained below.

### 4<sup>th</sup> Echos<sup>121</sup>

Three considerably different cases are grouped under this name, all of which develop in the mild *diatonic* scale in the *octachordon systema*, though a large number of melodic attractions take place in them. Firstly the one called *airmologikos* or *leyetos* (equivalent to *Segah Makam*), which has as its *vasi* the degree *Bov*, while its dominant degrees are *Bov* and  $\Delta\iota$ , its provisional stops are made on  $\Pi\alpha$ , *Bov* and  $\Delta\iota$  and its intermediary and final ones on *Bov*. The case of *sticherarikon* is considered to have  $\Pi\alpha$  as its *vasi* though its final stops are mostly on *Bov* (though older compositions used  $\Pi\alpha$  as their finalis). It is a combination of *Leyetos* with the 1<sup>st</sup> *Echos* and therefore can be paralleled with *Segah Maye Makam*. The latter case has  $\Pi\alpha$ , *Bov* and  $\Delta\iota$  as its dominant degrees, *Bov* and  $\Delta\iota$  as its provisional stops while the intermediary stops are made on  $\Pi\alpha$ . The third case is *papadikon eidos*, which has the special name *Aghia*. Having  $\Delta\iota$  as its *vasi* and finalis, it is famous for employing a large number of melodic attractions that affect the intonation of all the degrees except  $\Delta\iota$ . Dominant degrees in this case are  $\Delta\iota$ ,  $Z\omega$ ,  $\Pi\alpha'$  while the provisional stops are made on  $Z\omega$  and  $\Pi\alpha'$  and occasionally also on *Bov*,  $\Pi\alpha$  and  $\nu\eta$  and the intermediary ones on  $\Delta\iota$ ,  $\Pi\alpha'$ . We could interpret it as a combination of an old form of *Makam Neva* concluding on the homonymous *perde* with *Makams Eviç* and *Isfahan*, while occasionally using *Segah* and *Miüstear* as well.

### Plagal 1<sup>st</sup> Echos<sup>122</sup>

This is another typical mild *diatonic Echos*. The *airmologikos* case has its *vasi* on  $K\epsilon$ , dominant degrees the  $K\epsilon$  and  $N\eta$ , provisional stops on  $N\eta$  and  $\Pi\alpha'$  and intermediary and final ones on  $K\epsilon$ . It is important to note the lowering of  $\Pi\alpha'$  when the melody is developing

around  $N\eta$ . We could parallel this mode with a combination of a *Hüseyni* with a *Saba* transposed on *Hüseyni* having as its finalis the homonymous *perde*. The *Sticherarikos* or 1<sup>st</sup> *plagal trifonon* is rather different from the former with *vasi* on  $\Pi\alpha$ , dominant degrees the  $\Pi\alpha$ ,  $\Delta\iota$  and  $K\epsilon$  while the provisional stops are on  $\Delta\iota$ , and  $K\epsilon$ , intermediary on  $\Pi\alpha$  and final on  $\Delta\iota$  though at the very end of a series of musical sections in this mode, the final cadence has to be on  $\Pi\alpha$ . The cadences on  $\Delta\iota$  employing  $Z\omega$  flat and  $\Gamma\alpha$  sharp make this resemble a combination of *Hüseyni Makam* with *Buselik* transposed on *Neva perde*. Finally the *papadikos plagal* 1<sup>st</sup> *Echos* shares the same *vasi* and finalis with the *sticherarikos* but its dominant and cadencing degrees are different. The former are the  $\Pi\alpha$ ,  $\Gamma\alpha$ ,  $\Delta\iota$  and  $K\epsilon$  whereas the provisional stops are on  $\Gamma\alpha$ ,  $\Delta\iota$  and  $K\epsilon$  and the intermediary ones are on  $\Delta\iota$  and  $K\epsilon$ . This mode very much resembles *Makam Hüseyni*. Other interesting derivative branches of this *Echos* are the so-called *plagal* 1<sup>st</sup> *pentafonos* equivalent to *Makam Acem* or the famous cases using tense *diatonic* scales corresponding to *Makams Buselik* and *Kirdi*.

### Plagal 2<sup>nd</sup> Echos<sup>123</sup>

This *Echos* employs the tense *chromatic* scale developing in the *pentachordon* and *octachordon systemata* except in the case of *airmologikon eidos* where it works like the 2<sup>nd</sup> *Echos* in the soft *chromatic genus*. In the cases following the tense *chromatic genus* – being equivalent to *Hicaz* family of *Makams* – such as compositions in slow *sticherarikon* or in *papadikon eidos*, the *vasi* is  $\Pi\alpha$ , dominant degrees coincide with the provisional stops which are made on  $\Pi\alpha$ ,  $\Delta\iota$  and  $K\epsilon$ , whereas the intermediary and final ones are always made on  $\Pi\alpha$ . An interesting case is that of *Nenano*, having as its dominant degrees  $\Delta\iota$ ,  $Z\omega$  and  $\Pi\alpha'$ , provisional stops on  $Z\omega$ , and  $\Pi\alpha'$  and *enteleis* and *telikes* on  $\Delta\iota$ , functioning as a combination of *plagal* 2<sup>nd</sup> with 4<sup>th</sup> *Echos aghia*.

### Varys Echos<sup>124</sup>

This is the largest group of modal entities codified under the name of one *Echos* in this system. It employs both mild (in *octachordon systema*) and tense *diatonic* (in *tetrachordon systema*) scales accompanied by a big variety of melodic attractions. To categorize these modal entities we take into consideration the three possible *Vaseis*, which are  $\Gamma\alpha$ ,  $\zeta\omega$  natural and  $\zeta\omega$  flat. The first case having  $\Gamma\alpha$  as its *vasi* and final stop, is very close to 3<sup>rd</sup> *Echos*, though its intermediate stops ( $\Gamma\alpha$ ,  $\Delta\iota$ ,  $\Pi\alpha$ ,  $N\eta$ ) and dominant degrees ( $\Gamma\alpha$ ,  $\Delta\iota$ ,  $N\eta$  and  $Z\omega'$  flat) are slightly different. The so-called *Varys enharmonios* has  $\zeta\omega$  flat (*Acem Aşiran perde*) as its *vasi* while being the actual *plagal* of the 3<sup>rd</sup> *Echos* it employs a tense *diatonic* scale using two disjunct tetrachords of the type major tone-major tone-*lemma* starting from  $\zeta\omega$  flat. In *Makam* language this

mode is the equivalent of *Acem Aşiran Makam*. The third case is the most polymorphous one employing a big variety of provisional and intermediary stops on ζω, Πα, Γα, Δι, Ζω virtually corresponding to several *Makams* such as *Irak*, *Evic*, *Bestengar*, *Rahatulervah* etc. all sharing ζω natural (*Irak perde*) as their finalis. Of particular interest is a case of the latter group using as its main tonal centre the fifth of the *vasi* Γα sharp (*Hicaz perde*).

#### Plagal 4<sup>th</sup> Echos<sup>125</sup>

This is a group of modal entities having as its *vasi* the starting point of the “basic” scale νη. The most important case of *plagal* 4<sup>th</sup> is in the mild *diatonic* scale having as its dominant degrees νη, Βου and Δι, its provisional stops on νη, Βου, Δι, δι and Πα, intermediary ones on νη and Δι and finalis on νη, this being directly equivalent to *Rast Makam*. There are many derivative modes of the one described above, such as the *difonos*, or cases employing mild or tense *chromatic* scales or tense *diatonic* ones corresponding to various *Makams* such as *Sazkar*, *Nikriz*, *Suzinak*, *Nihavend*, *Hicazkar* etc. all having as their finalis *Rast perde*. The case of *ermologikos* 4<sup>th</sup> *plagal Echos* behaves as a transposition of the above mode on Γα.

#### MODULATION AND THE TOOLS OF FTHORES AND CHROES

Since ancient times the term *chroa* (lit. “color”, “shade”) was used to specify any kind of different division of tetrachords and scales other than the standard ones of the *diatonic*, *chromatic* and *enharmonic genera*. In this manner Chrysanthos gives an algorithm of producing *chroes* by systematic alteration of the degrees of the *diatonic* scale, ending up with 740 different combinations.<sup>126</sup> Karas defines *chroes* as “specific subdivisions of the *genera*”<sup>127</sup>, i.e. the *chroes* of “mild” and “tense” *diatonic* as well as those of the “mild” and “tense” *chromatic*. Among the innovations introduced by the reform of 1814 were three symbols (parts of the set of *fthores*) with a specific modulating function,<sup>128</sup> which were named by the Committee of 1881 as the “three *chroes*”. According to Karas this usage of the term *chroa* is incorrect, introduced only to explain *Makams Nişabur*, *Hisar* and *Müstear*.<sup>129</sup>

Nevertheless these three *chroes* are widely accepted in contemporary theory<sup>130</sup> and as analytical tools have an interesting difference from the much broadly used tetrachords and pentachords. Instead of functioning as independent scale subunits, they are placed at a certain degree of the “basic” scale, which is thereafter their tonal centre, having the effect of polarizing its neighbouring degrees by altering their intervallic relations in a certain manner. Table 8 depicts this polarizing effect for each one of them.

*Metavole* (modulation) has already been mentioned by ancient Greek theorists, as one of the important aspects of *melos* (melody).<sup>131</sup> Chrysanthos explains the necessity of *metavole* as the basic means to avoid monotony and tediousness.<sup>132</sup> Modal variety and modulation are crucial tools for attaining the above mentioned goal of underlining the meaning and religious messages of the poetic text. Panagiotopoulos shows how several typical text meanings are underlined by using “mild” or “tense” *chromatic genera*.<sup>133</sup> An interesting aspect of the Byzantine theoretical model is the systematized analysis of modulation developed in the modern period. Contemporary standard theory texts distinguish between three main mechanisms of modulation, *metathesis* or “tone modulation” where the modulation leads to a transposition while remaining in the same *genus*, “modulation by genus” where we have a change of *genus* without any transposition, and *parahordi* which is a combination of the first two.<sup>134</sup> These modulations are indicated by the *fthores*, the 13 signs established by the three reformers of 1814. Apart from the ϩ which is also used for flattening a degree, the other 12 do not affect the intonation of the specific degree but alter its role. To explain this mechanism we first need to present these 13 *fthores* and the implications of their appearance at a certain point of a music score. Eight of these signs are used for the degrees of the “mild” *diatonic* scale starting from Νη (*Rast perde*) and ranging up to upper Νη’ (*Gerdaniye perde*) as shown in Table 9. The next four are for the “mild” and “tense” *chromatic genera*, serving alternatively as the *fthores* of all the degrees of the two *chromatic* scales. In their case, the first letter of the corresponding solmisation syllable accompanies the sign of the *fthora* wherever the exact degree needs to be specified. The function of the *fthores* (except ϩ) is to transform the specific note to a degree of another scale as pointed out by the sign. Table 9 below shows all 13 *fthores* for each particular *genus* or *chroa* along with the specific degree it is employed to signify.<sup>135</sup>

For example, if the chant is using the “mild” *diatonic* scale and the “mild” *chromatic fthora* of Δι (*Neva perde*) is placed on Δι itself, this means that the specific degree is transformed to a Δι of a “mild” *chromatic* scale. From this point on we have the so-called *desis* (lit. “tying”) of the melody, which continues as a *fthorikon melos* (lit. “modulated melody”) in the *chromatic genus* until another *fthora* changes the situation again.

#### CONCLUSIONS

Istanbul was the main centre where the development of Orthodox chanting in both the Byzantine and Ottoman Empires took place. The interaction of this chanting practice with other musical idioms sharing the same multicultural environment is obvious in their affinity on both a practical, as well as theoretical level.

About the notation system, a very important characteristic of the *parasemantiki* notation system, even in its contemporary analytical version, is the fact that it assumes a high level of proficiency by the prospective reader and thus it does not contain much of the information needed to perform these scores. This is also true for all notation systems used to depict Near and Middle Eastern modal monophonic music – the reason being mainly the exceptional elaboration of its single melodic line. The fact that this elaboration consists of details in intonation, rhythm, ornamentation, phrase analysis and style, restrains the role of notation; the latter takes then the role of a mnemonic code and consequently these traditions come to rely mostly on oral transmission.

One of the main concerns of scholars attempting to theorize the Byzantine chanting tradition has been to propose euphonic combinations of “epimoric”<sup>136</sup> or small number ratios for the amazing variety of intervals implied by the phenomena of *genera* and “melodic attractions” – a strategy that sits well within the ancient Greek as well as Arabian musicological legacy. Nevertheless, until scientifically confirmed, the only thing this abundance of possible natural intervals proves is the range of potential choices for a musician to express himself through minute variations in intonation.

Although the contemporary Orthodox chanting

practice seems to be influenced by Near and Middle Eastern music idioms, the present-day structure of its *Octoechos* system presents a high affinity with the ancient Greek equivalent. Concepts such as tetrachords and pentachords, *genus*, *systema*, general scale of a *genus*, “melodic attractions”, *chroes*, the rules of *metavole*, the theory of *ethos*, as well as the mathematical description of intervals, all derive from ancient Greek music theory. Even if the elegance and perfect symmetry of the hierarchical and partly closed-ended old system of eight *echoi* was disturbed by the reforms of 1814, the contemporary system still maintains the structural characteristics and the philosophy of the old one. Furthermore, the embroilment of morphological and textual criteria in the categorization of *echoi* makes the *Octoechos* system a peculiar “semi-modal” complex, differing considerably from the Ottoman-Turkish and Arabian versions of the *Makam* modal system.

Modern theoretical and notation systems of Byzantine chanting tradition exhibit an impressive variety of analytical and methodological tools, which even though they align with the general philosophy and aesthetics of their counterparts of the great Near and Middle Eastern music traditions, they at the same time present a different perspective in the endeavour to understand, explain and depict similar musical phenomena.

The polarizing effect of the three *chroes* on the ‘fundamental’ scale  
(Numbers in parenthesis indicate approximate sizes in Merkatoric commas)

νη	Πα	Bou	Γα	Δι	Κε	Zω	Nη	Πα
12 (9)	10 (7)	8 (6)	12 (9)		12 (9)	10 (7)	8 (6)	12 (9)
	14 (10)		12 (9)	4(3)				
<i>Kliton</i>								
νη	Πα	Bou	Γα	Δι	Κε	Zω	Nη	Πα
12 (9)	10 (7)	8 (6)	12 (9)		12 (9)	10 (7)	8 (6)	12 (9)
	18 (13)	4(3)	16 (12)	4(3)				
<i>Zygos</i>								
νη	Πα	Bou	Γα	Δι	Κε	Zω	Nη	Πα
12 (9)	10 (7)	8 (6)	12 (9)		12 (9)	10	8	12
			20 (15)		4(3)	4(3)	14 (10)	
<i>Spathi</i>								

Table 8. The three *Chroes* and their effect on the Fundamental scale.<sup>137</sup>

<b>Fthores and Chroes</b>								
	νη	Πα	Bou	Γα	Δι	Κε	Zω	Nη
"Mild" Diatonic	Ϛ	ϙ	ϛ	Ϝ	Ϟ	ϟ	Ϡ	ϡ
"Mild" chromatic	ϛ	ϙ <sup>x</sup>	ϛ	Ϝ <sup>x</sup>	Ϟ	ϟ <sup>x</sup>	Ϡ	ϡ <sup>x</sup>
"Tense" chromatic	ϙ	ϙ <sup>o</sup>	ϙ	ϙ <sup>o</sup>	ϙ	ϙ <sup>o</sup>	ϙ	ϙ <sup>o</sup>
Enharmonic			ϙ	ϙ				
<i>Zygos</i>			ϙ <sup>x</sup>		ϙ <sup>x</sup>			
<i>Kliton</i>					ϙ <sup>o</sup>			
<i>Spathi</i>				ϙ		ϙ		

Table 9. *Fthores* and *chroes*.

## Glossary

*Apechema* ⇒ Introductory melody typical for each mode.

*Ateleis Katalixeis* ⇒ See *Katalixeis* below.

*Avaz* (part of vocal repertory of Persian classical music) ⇒ Free non-metric vocal form following the metric structure of poetic text.

*Avaz* (part of Modal complex of *Dasgah-Avaz*) ⇒ Secondary group of modal and morphological entities of Persian classical music *Radif*.

*Çeşni* ⇒ Colour or flavor or atmosphere of a certain *Makam* usually as a temporal modulation (Turkish system).

*Chroa* (pl. *chroes*) ⇒ Specific modal nucleus defined around a tonal centre, having a particular polarizing effect on the adjacent degrees around this centre.

Chromatic ⇒ Modal unit employing augmented seconds.

*Despozousa* ⇒ Dominant degree (not necessarily the fifth like in western music).

Diatonic (“mild”) ⇒ Modal unit employing all types of tones (including neutral) as well as major semitones (see Table 5).

Diatonic (“tense”) ⇒ Modal unit employing only major tones and Pythagorean lemmas (see Table 5).

*Dörtlüsi* ⇒ Tetrachord (Turkish system).

*Dasgah* system ⇒ An organization of the *Radif* repertoire in 12 categories 7 *Dasgah* and 5 *Avaz*.

*Echos* (pl. *echoi*) ⇒ The modal entities of the *Octoechos* complex.

*Eidos* ⇒ Morphological classification of compositions.

*Eirmologikos* ⇒ The syllabic *eidos* where each syllable of the text covers 1-2 time units, the tempo is fast and whole groups of hymns share the same melody.

*Enharmonic* intervals ⇒ Intervals smaller than the Pythagorean lemma.

*Enharmonic genus* ⇒ The *genus* employing enharmonic intervals (see Table 5).

*Entaleis Katalixeis* ⇒ see *Katalixeis* below.

*Fthores* ⇒ Signs serving to signify modulations.

*Genus* (pl. *Genera*) ⇒ A modal class employing the same types of intervals.

*Giriş* ⇒ Opening degree, i.e. the first cadencial stop of a melody (Turkish system).

*Güçlü* ⇒ Dominant degree (Turkish system).

*Isokrates* ⇒ Drone keeper.

*Ison* (or *Isokratema*) ⇒ Drone.

*Karar* ⇒ Finalis (Turkish system).

*Katalixeis* ⇒ Cadencial stops divided in three types ⇒ *ateleis* (provisional), *enteleis* (intermediate) and *telikes* (final).

*Kliton* ⇒ *Chroa* corresponding to Turkish *Nişabur çeşni*.

*Martyria* (*arkitiki*) of an *Echos* ⇒ Symbols put at the beginning of a score to specify the mode of a chant.

*Martyries* of degrees ⇒ Special signs (depending on the *genus*) employed to signify the specific degree of a scale.

Melodic attractions ⇒ Alterations in the intonation of certain degrees depending on a complex system of laws relying mostly on oral tradition.

*Metavole* ⇒ Modulation.

Mild (diatonic or chromatic) ⇒ See endnote No.53.

*Nim-perdeler* ⇒ In contrast with *tam-perdeler* (the degrees of the fundamental scale), *nim-perdeler* are the altered degrees which are intonated higher or lower from the *tam* (main) degrees, exactly corresponding to the “*fthorikes*” of the Byzantine system.

*Octoechos* or *Octaechia* ⇒ An organization of the Byzantine chanting repertoire in 8 categories based mainly on modal but also on morphological and textual characteristics.

*Paralagi* ⇒ The practice of singing the melody using solmisation syllables equivalent to Western *sofège*.

*Parasemantiki* ⇒ The notation system in both ancient Greek and Byzantine terminology.

*Perde* ⇒ Fret as well as degree in the Turkish system such as the *Rast*, *Dügah*, *Segah*, *Çargah*, *Neva*, *Hüseyni*, *Eviç*, *Gerdanye*, *Muhayyer* etc. of the Turkish fundamental scale.

*Papadikon* ⇒ The slow and melismatic *eidos*, in which the syllables of the text cover a large number of time units.

*Radif* ⇒ The repertoire of classical Persian music.

*Raga* ⇒ Modal entity of the Hindustani (North-Indian) classical music modal system.

*Seyir* ⇒ “Scenario” of the melodic progression of a certain *Makam* (Turkish system).

*Spathi* ⇒ *Chroa* corresponding to Turkish *Hisar çeşni*.

*Sticherarikon* ⇒ The *eidos* containing the “moderately short” pieces where each syllable covers 2 up to 4 time units (in the case of old *sticherarikon* it can reach up to 8).

Systema ⇒ Method of constructing scales by repeating the same modal unit.

Tense ⇒ (diatonic or chromatic) see endnote No. 53.

*Thaat* ⇒ Scale type of Indian classical music *Raga* modal system.

*Tmima* (pl. *Tmimata*) or *dodekatimoria* ⇒ measurement unit to specify the size of an interval, considered to be 1/72th of an octave.

Tonic rhythm ⇒ Rhythm that follows the metric structure of the poetic text.

*Vasi* ⇒ Finalis of an *Echos*.

*Zygos* ⇒ *Chroa* corresponding to Turkish *Miüstear çeşni*.

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## Notes

<sup>1</sup> The present work is an updated version of material presented in my Master's Thesis; it also contains material prepared for the (unpublished until today) volume *Music in the Mediterranean, Modal classical traditions, Vol. 2 Theory and Practice* (Feldman, W. & Guettat, M. & Kerbage, T. eds.) which was planned in the frame of *Medimuses* project undertaken by the organization En Chordais.

<sup>2</sup> The current presentation analyzes the main aspects of this tradition while also trying to foreground the parallels between its methodological tools and Near Eastern musicology, and in particular Ottoman-Turkish theory; such a methodological choice nevertheless follows a well established tradition of comparativism between these two discourses mainly expressed by Panayiotis Chalatzoglou, Kyrillos Marmarinos, Stefanos Domestichos, Apostolos Konstas Chios, Konstantinos Protopsaltis and Panayiotis Kilzanidēs (see [Popescu-Judetz *et al.*, 2000; Apostolopoulos, 2002; Stephanos (Domestichos), 1843; Konstantinos (Protopsaltis), 1843; Kilzanidēs, 1991]).

<sup>3</sup> [Talā'ī, under publication, p. 12–14]: all the particular musicological terms used in this article are explained in the attached glossary.

<sup>4</sup> Reminiscent of the *Dasgah* organization of Persian classical music *radif*.

<sup>5</sup> Musicological sources from this period consist of a large number of theoretical treatises starting with Chrysanthos' *Introduction* [1821], numerous collections of transcribed music as well as recordings from as far back as the beginning of the twentieth century. In the 19<sup>th</sup> century, at least 60 theoretical discourses were published, while the beginning of the 20<sup>th</sup> century coincides with an expansion in the number of musical publications and the appearance of the first musicological periodicals focusing on Byzantine chant (*Formynx, Musiki, Ecclesiastiki Alithia*). By the end of the century, with the contribution of Western musicological research, the bibliography dealing with Byzantine music had reached some 1000 titles.

<sup>6</sup> From this point “*parasemantiki*”.

<sup>7</sup> See [Stathis, 1992, v. 1, § 3.4].

<sup>8</sup> See [Papadopoulos, 1977, p. 312; Rōmanou, 1985, p. 8–9].

<sup>9</sup> A key figure in Post-Byzantine Orthodox chant who was given the nickname *Hirsız* (lit. “thief”), as he had developed an elaborate system which made him capable of immediately transcribing melodies (see [Papadopoulos, 1977, p. 321]).

<sup>10</sup> See [Psachos, 1978, p. 65–95].

<sup>11</sup> It is worth mentioning here that Chrysanthos' first application of the “new analytical method” in teaching caused his “exile” to his birthplace Madytos. According to Papadopoulos [1977, p. 333], he was immediately recalled when the Patriarchate became convinced of the efficiency of his teaching method.

<sup>12</sup> See [Rōmanou, 1985, p. 20].

<sup>13</sup> See [Alygizakis, 1985, p. 198; Stathis, 1972, p. 423].

<sup>14</sup> In this article we chose to use a straight forward transliteration from Greek to English based on modern Greek pronunciation (for example *fhores* instead of *phthores* and *Kointilianos* instead of *Quintilianus*).

<sup>15</sup> See [Stathis, 1972, p. 423].

<sup>16</sup> (Note from the editors): we do not really understand this peculiar usage of transliteration.

<sup>17</sup> See Chalatzoglou (in [Popescu-Judetz *et al.*, 2000, p. 35]) & [Kilzanidēs, 1991, p. 17].

<sup>18</sup> An analogous non-mathematical time interpretation stands for the long and short temporal values in Persian classical music (see [Talā'ī, under publication]).

<sup>19</sup> *Fthores* are another important aspect of this system, which mainly serve to signify modulations by means of alterations of the scale, *genus* or *systema* of a composition (see below in text).

<sup>20</sup> The latter scheme interprets *chromatic* scales as repetitions of the same two intervals developing in a sort of *trichordon systema* throughout the whole two-octave range of the *chromatic genera*. Although this is considered false by contemporary theoreticians and practitioners, the symbolic representation on the level of *martyries* remained unchanged.

<sup>21</sup> [Efthimiadēs, 1988, p. 241; Panagiotopoulos, 1949, p. 109].

- <sup>22</sup> The Committee's introduction of only even numbered *tmimata* alterations (2, 4, 6, 8, 10) created confusion and misunderstandings on the level of the intervallic texture of this music. On the other end Karas utilized alteration of even half a *tmima* like in case of intervals of  $5\frac{1}{2}$  or  $7\frac{1}{2}$  *tmimata* (see [Karas, 1989, p. 16–28; 1993, p. 30–31].
- <sup>23</sup> [Karas, 1982a; 1982b], [Konstantinou, 1997].
- <sup>24</sup> [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 95–99].
- <sup>25</sup> [Commission musicale de (Musical Committee of) 1881, Aphtonidēs *et al.*, 1888, p. 14–26].
- <sup>26</sup> See [Ellis, 1885].
- <sup>27</sup> In the present article, all correspondences of degree names as well as other Near Eastern musicological terms are made with reference to the Ottoman-Turkish theoretical model and the long tradition of comparative parallelism mentioned above. Thus *Rast perde* is the degree *Rast* of the fundamental scale of Turkish *makam* theory which corresponds to the degree  $\nu\eta$  of the Byzantine basic scale (Chalatzoglou in [Popescu-Judetiz *et al.*, 2000, p. 35] & [Kilzanidēs, 1991, p. 17]).
- <sup>28</sup> [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 28; Commission musicale de (Musical Committee of) 1881, Aphtonidēs, *et al.*, 1888, p. 20; Efthimiadēs, 1988, p. 66; Karas, 1989, p. 8] and [Chatziathanasiou, 1948, p. 10].
- <sup>29</sup> [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 19–21, 25–28, 99].
- <sup>30</sup> In the geometric method, the adding of intervals is made by multiplying their ratios while subtracting by division.
- <sup>31</sup> [Barker, 1989, v. II, p. 349].
- <sup>32</sup> [Commission musicale de (Musical Committee of) 1881, Aphtonidēs, *et al.*, 1888, p. 14–21].
- <sup>33</sup> [Panagiotopoulos, 1949, p. 7–22].
- <sup>34</sup> [Efthimiadēs, 1988, p. 200–201].
- <sup>35</sup> [Karas, 1982a; 1982b; 1989].
- <sup>36</sup> [Lykouras, 1994, p. 26].
- <sup>37</sup> Unfortunately the old method of measuring intervals by means of a monochord, used by most scholars mentioned above, seems somewhat antiquated nowadays and does not offer adequate proof to decide on such minute differentiations. Until modern laboratory results provide well-documented measurements on the actual intervals used in practice, these suggestions will continue to remain more in the domain of the fine art of abstract mathematics.
- <sup>38</sup> Other recent contributions to intervallic theory are [Lekkas, 1986; 1987; Skoulios, 2007; Vetsos, 2001].
- <sup>39</sup> Even though not directly referred to, *dodekatimoria* (lit. “particle equal to one twelfth of a tone” were already implied by Aristoxenos’ as the difference between  $\frac{1}{3}$  and  $\frac{1}{4}$  of the major tone (see [Barker, 1989, v. II, p. 645] and [Michaelidēs, 1982, p. 102–103].
- <sup>40</sup> [Mathiesen, 1999, p. 292].
- <sup>41</sup> [Misaelidēs, 1902].
- <sup>42</sup> [Karas, 1982a; 1982b].
- <sup>43</sup> *Genera* is the plural of the Greek word *genus* literally meaning “gender”, “specie”.
- <sup>44</sup> [Barker, 1989, v. II, p. 11–13 & 140].
- <sup>45</sup> [Marcus, 1989, p. 271–323; Özkan, 1984, p. 41–50; Talāī, 2001, p. 10–32] and [Jairazbhoy, 1995, p. 76–89].
- <sup>46</sup> [Barker, 1989, v. II, p. 11–13 & 140].
- <sup>47</sup> By “incomplete” here we mean tetrachords and pentachords whose ends do not form a perfect 4<sup>th</sup> and 5<sup>th</sup> respectively such as *Saba* tetrachord and *Eksik Segah*, *Eksik Müstear* and *Eksik Ferahmak* pentachords of Turkish theory [Özkan, 1984, p. 47–48].
- <sup>48</sup> [Michaelidēs, 1982, p. 82].
- <sup>49</sup> In the case of rhythm, *genera* was a categorization on the basis of the ratio between time duration of *thesis* (down-beat) and *arsis* (up-beat) resulting in the *daktyliko* (ratio 1:1), *iamviko* (2:1), *paioniko* (3:2), and *epitrito* (4:3) *genera* (see [Barker, 1989, v. II, p. 188–189] & [Michaelidēs, 1982, p. 82]).
- <sup>50</sup> [Karas, 1982a, v. A, p. 236].
- <sup>51</sup> [Barker, 1989, v. II, p. 356–357].
- <sup>52</sup> [Karas, 1982a; 1982b].
- <sup>53</sup> The term “mild” is considered to describe the smooth and even transition from one degree to the other which is characteristic of both *genera* divisions (*diatonic* and *chromatic*) compared to the “tense” ones, where these transitions are more abrupt and steep due to the contrast created by their bigger size difference. Another way to understand the significance of the mild divisions is the common fact of the use of “mild” or neutral intervals (see Table 5) while in the tense divisions these neutral intervals do not exist. Along with the use of these mild intervals comes the extensive use of melodic attractions that characterize the performing attitude towards these intermediate degrees which tend to be very fluid in their intonation depending on a complicated system of oral aesthetic rules. Ancient scholars refer to several types of *diatonic* tetrachords using various names and many different combinations of intervals (see [Barker, 1989, v. II, p. 349–350]).
- <sup>54</sup> The Mercatoric arithmetic system divides the octave in 53 Mercatoric commas and is employed in contemporary Turkish theory.
- <sup>55</sup> The conversions from Byzantine *tmimata* (*dodekatimoria*) into Mercatoric commas involve approximations in order for the measures of the corresponding intervals to be more easily conceived; see also Table 5.
- <sup>56</sup> [Misaelidēs, 1902, p. 82–84], see also Table 5.
- <sup>57</sup> We need to remind the reader at this point that all comparisons are made with reference to Turkish theory tetrachords.
- <sup>58</sup> [Michaelidēs, 1982, p. 357–358].
- <sup>59</sup> [Karas, 1982a, v. A, p. 4–23].
- <sup>60</sup> [Barker, 1989, v. II, p. 12–13].
- <sup>61</sup> Personal communication with P. Neohoritis, T. Apostolopoulos, T. Georgiadis, N. Andrikos and others.
- <sup>62</sup> [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 113–117].
- <sup>63</sup> [Commission musicale de (Musical Committee of) 1881, Aphtonidēs, *et al.*, 1888, p. 20].
- <sup>64</sup> [Misaelidēs, 1902, p. 62].
- <sup>65</sup> See [Panagiotopoulos, 1949] or [Efthimiadēs, 1988], [Karas, 1982a; 1982b], [Konstantinou, 1997].
- <sup>66</sup> [Efthimiadēs, 1988, p. 18–19 & 193–219].
- <sup>67</sup> [Panagiotopoulos, 1949, p. 100–107].
- <sup>68</sup> These special modulation signs are *ffhores* and *chroes* (see below).
- <sup>69</sup> For an extended analysis of the *Thaat* system as well as an introduction of an upgraded 32-*Thaat* categorization of Indian Ragas see [Jairazbhoy, 1995].
- <sup>70</sup> [Michaelidēs, 1982, p. 298–302].
- <sup>71</sup> [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 25].
- <sup>72</sup> (Note from the editors): presumably, to which should be added the *diphonia system* based on *trichords*.
- <sup>73</sup> [Barker, 1989, v. II, p. 330].

- <sup>74</sup> Ancient Greek musicology refers to two main categories of degrees, *estotes* (lit. “fixed”) (Nicomachos) or *akiniōtoi* (lit. “non-movable”) (Aristoxenos) and *kinoumenoi* (lit. “movable”): see [Michaelidēs, 1982, p. 126].
- <sup>75</sup> [Katsifis, 1996, p. 101–106].
- <sup>76</sup> [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 103].
- <sup>77</sup> [Apostolopoulos, 2002, p. 215–220].
- <sup>78</sup> [Commission musicale de (Musical Committee of) 1881, Aptonidēs, *et al.*, 1888, p. 48–49].
- <sup>79</sup> Apostolopoulos gives an analytical account of this in [2002, p. 216–219].
- <sup>80</sup> [Mazaraki, 1993, p. 101].
- <sup>81</sup> [Karas, 1982a, v. A, p. 6 of the introduction].
- <sup>82</sup> [Karas, 1982a; 1982b].
- <sup>83</sup> [Efthimiadēs, 1988, p. 256–257, 261, 264].
- <sup>84</sup> [Konstantinou, 1997].
- <sup>85</sup> [Psachos, 1978, p. 153, 170, 174; 1908, p. 1–58].
- <sup>86</sup> [Katsifis, 1996].
- <sup>87</sup> [Vetsos, 2001].
- <sup>88</sup> [Apostolopoulos, 2002, p. 225].
- <sup>89</sup> See [Karas, 1982b, v. B, p. 199–219] & [Efthimiadēs, 1988, p. 484].
- <sup>90</sup> [Efthimiadēs, 1988, p. 465].
- <sup>91</sup> Karas stresses on the importance of the presence of the drone by saying that “having to refer to the *vasi* in one’s imagination is not the same thing as constantly hearing that note as a consonant reference drone” (see [Karas, 1982b, v. B, p. 200]).
- <sup>92</sup> [Katsifis, 1996, p. 101–106].
- <sup>93</sup> [Efthimiadēs, 1988, p. 47–62].
- <sup>94</sup> [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 81].
- <sup>95</sup> [Tura, 1995, p. 12].
- <sup>96</sup> (Note from the editors): “interpretation”.
- <sup>97</sup> [Panagiotopoulos, 1949, p. 133–138].
- <sup>98</sup> As is the case for *Octoechos* explained below, the *Dastgah* macro-system is not a categorization based on modal characteristics only, but it groups instead its entities in chains, using morphological, rhythmical and aesthetic criteria as well. The result is the 7 *Dastgah* - 5 *Avaz* complexes organization of the classical Persian music repertoire, each complex of which contains entities with various modal characteristics (see [Farhat, 1990; Caton, 2001; Talā’i, 2001]).
- <sup>99</sup> [Powers, 1980, p. 422–423].
- <sup>100</sup> The philosophy of categorizing melodic material in modes sharing common melodic characteristics and organizing these modes in the form of a modal system has changed a lot during the long music history of this area. In the ancient period many theoreticians tended to balance between the attempt to accurately describe music practice and the intention to create an elegant strictly hierarchical and symmetrical model that reflects the order and symmetry of the universe. This endeavour produced modal systems which harmonized with the old cosmological principles, deriving from mathematics, numerology, astronomy, astrology, medicine and many other branches of human knowledge and research. Such systems were strictly hierarchical and symmetrical, having a small number of primary and a big number of secondary subordinate modal entities, organized in popular arithmetic schemes such as 7, 12, 24 or 12, 24, 48 etc. These systems were conceived as closed-ended concerning the primary modes and open-ended for the derivative and composite modes leaving free space for new creations (see [Wright, 2000, p. 800; Powers, 1980, p. 422, 423, 427, 428, 435]).
- <sup>101</sup> [Wright, 2000, p. 800; Powers, 1980, p. 422, 423, 427, 428, 435].
- <sup>102</sup> [Bor, 1999, p. 2–4].
- <sup>103</sup> [Konstantinou, 1997, p. 68–71].
- <sup>104</sup> [Konstantinou, 1997, p. 68–71].
- <sup>105</sup> We can see here the direct reference to the ancient Greek idea of derivation of the basic modes by transposition of the *vasi* (finalis-tonic) on a reference “basic” scale apparent also in the old form of Middle Eastern modes and their Persian names *Yegah*, *Dugah*, *Segah*, *Chahargah*, *Pancgah*, *Shashgah*, *Haftgah*. The latter originating from the Persian names of the numbers *yek* (one), *du* (two), *si* (three), *chahar* (four), *panj* (five), *shash* (six), *haft* (seven) and the suffix *-gah*, meaning “place”, “position” (see [Feldman, 1996, p. 199]) obviously resemble with the alphabetic rationale of *Πα, Βου, Γα, Δι, Κε, Ζω, Νη*.
- <sup>106</sup> [Konstantinou, 1997, p. 68–71].
- <sup>107</sup> Related to that and therefore interesting to mention here is that one of the main reasons for the Committee’s introduction of the Western notion of absolute pitch and the assignment of the value of *do* = 512 Hz to *νη*, was the Patriarchate’s desire to restrain chanters from performing in high registers [Commission musicale de (Musical Committee of) 1881, Aptonidēs, *et al.*, 1888, p. 24].
- <sup>108</sup> [Özkan, 1984, p. 120, 140, 288].
- <sup>109</sup> [Signell, 1986, p. 60–65].
- <sup>110</sup> [Apostolopoulos, 2002, p. 154–193].
- <sup>111</sup> [Efthimiadēs, 1988, p. 354].
- <sup>112</sup> [Panagiotopoulos, 1949, p. 172–238].
- <sup>113</sup> [Panagiotopoulos, 1949, p. 125–126].
- <sup>114</sup> See for example [Panagiotopoulos, 1949, p. 205].
- <sup>115</sup> [Siamakis, 1990, p. 39].
- <sup>116</sup> [Panagiotopoulos, 1949, p. 130–131].
- <sup>117</sup> The following presentation will restrict itself to a very concise structural description of the prominent modal entities of each one of the eight categories as they are being taught today, leaving out their particular characteristics such as the *apechema*, the *arkiki martyria*, the *ambitus*, the specific melodic attractions, the *ethos* and the typical *theseis*.
- <sup>118</sup> [Panagiotopoulos, 1949, p. 171–180], [Efthimiadēs, 1988, p. 355–364], [Konstantinou, 1997, p. 86–94], [Giannelos, 2009, p. 115–127].
- <sup>119</sup> [Panagiotopoulos, 1949, p. 181–189], [Efthimiadēs, 1988, p. 364–376], [Konstantinou, 1997, p. 169–191], [Giannelos, 2009, p. 115–127].
- <sup>120</sup> [Panagiotopoulos, 1949, p. 189–195], [Efthimiadēs, 1988, p. 377–382], [Konstantinou, 1997, p. 127–134], [Giannelos, 2009, p. 115–127].
- <sup>121</sup> [Panagiotopoulos, 1949, p. 196–204], [Efthimiadēs, 1988, p. 382–395], [Konstantinou, 1997, p. 111–126], [Giannelos, 2009, p. 115–127].
- <sup>122</sup> [Panagiotopoulos, 1949, p. 205–212], [Efthimiadēs, 1988, p. 396–411], [Konstantinou, 1997, p. 111–126], [Giannelos, 2009, p. 115–127].
- <sup>123</sup> [Panagiotopoulos, 1949, p. 212–221], [Efthimiadēs, 1988, p. 411–421], [Konstantinou, 1997, p. 193–198], [Giannelos, 2009, p. 115–127].
- <sup>124</sup> [Panagiotopoulos, 1949, p. 225–228], [Efthimiadēs, 1988, p. 421–439], [Konstantinou, 1997, p. 148–159], [Giannelos, 2009, p. 115–127].

<sup>125</sup> [Panagiotopoulos, 1949, p. 229–238], [Efthimiadēs, 1988, p. 439–453], [Konstantinou, 1997, p. 79–85 & 143–148], [Giannelos, 2009, p. 115–127].

<sup>126</sup> [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 122].

<sup>127</sup> [Karas, 1982a, v. A, p. 237].

<sup>128</sup> [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 170–171].

<sup>129</sup> [Karas, 1982b, v. B, p. 144].

<sup>130</sup> [Panagiotopoulos, 1949, p. 107–110], [Efthimiadēs, 1988, p. 238–244], [Giannelos, 2009, p. 95–98].

<sup>131</sup> [Barker, 1989, v. II, p. 328–329, 484].

<sup>132</sup> [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 169].

<sup>133</sup> [Panagiotopoulos, 1949, p. 336–340].

<sup>134</sup> [Panagiotopoulos, 1949, p. 107–110], [Efthimiadēs, 1988, p. 238–244].

<sup>135</sup> [Panagiotopoulos, 1949, p. 107–110] & [Giannelos, 2009, p. 84–98].

<sup>136</sup> (Note from the editors): “epimoric” intervals are intervals the ratios of which are in the form  $n/(n+1)$ .

<sup>137</sup> Numbers between parenthesis indicate Mercatorian commas.

## MODAL DIVERSITY IN EARLY OTTOMAN MUSIC

### THE CASE OF MAKÂM SABÂ

Jacob Olley\*

The collections of musical notation that survive from the 17<sup>th</sup> and early 18<sup>th</sup> century Ottoman tradition provide us with invaluable material for understanding the processes of historical change in modal music.<sup>1</sup> This study attempts to trace the historical development of a single mode, *makâm sabâ*,<sup>2</sup> by analysing and comparing its repertoire as it was recorded in the earliest Ottoman collections of notation. The three primary sources which form the basis of this study were written by two individuals of European origin who were resident in Istanbul during the 17<sup>th</sup> and early 18<sup>th</sup> century, ‘Alî Ufîkî<sup>3</sup> and Demetrius Cantemir<sup>4</sup>. The two collections belonging to ‘Alî Ufîkî are dated to ca. 1650,<sup>5</sup> while that of Cantemir is dated to ca. 1700, providing us with a time frame of half a century during which the repertoire was notated, though some pieces are likely to have an earlier origin in the oral tradition. These collections contain a sizeable corpus of vocal and instrumental compositions in *makâm sabâ*, which display a degree of heterogeneity indicative either of temporal change, or of considerable variability in contemporary practices (or both).

Of the three sources we have mentioned, the Cantemir collection<sup>6</sup> is the most well known and thoroughly researched, while the earlier of ‘Alî Ufîkî’s two manuscripts has remained unstudied until recently.<sup>7</sup> Wright [2000] has made the most detailed analysis of individual modes in the *Edvâr*, while Feldman [1996] has presented more general observations on early modal development, drawing primarily on the *Edvâr* but also ‘Alî Ufîkî’s *Mecmû‘a-i Sâz ü Söz*. The large number of pieces that were recorded independently by both Cantemir and ‘Alî Ufîkî show that parts of the repertoire remained stable over several decades, but differences in notation also suggest that the modal system changed during the course of the 17<sup>th</sup> century. By comparing versions of pieces as they appear in different collections, this study further

aims to interpret the notational methods of their authors, and discusses the relationship between musical practice and its written representation.

Although this study does not attempt to question modality as a conceptual paradigm, it does aim to broaden our understanding of modality in a particular historical context. Historical musicology inevitably tends towards a linear analysis of modal development that reflects the chronological ordering of textual sources, but detailed reading of the sources themselves hints at a more complex and disordered reality. Previous scholarship involving historical analysis of the Ottoman modal system<sup>8</sup> has focused on periodisation and has therefore encouraged an evolutionary view of the musical characteristics that are seen in the early repertoire. While the present study is indebted to these works, and discusses modal development from a broadly diachronic perspective, it also considers synchronic aspects of musical change and the impact of various factors apart from historical progression.

#### MAKÂM SABÂ IN CANTEMIR’S *EDVÂR*: HISTORICAL STRATA

In his discussion of *makâm sabâ*, Wright [2000, p.124–133] proposes that the *Edvâr* repertoire shows evidence of historical layering, with some pieces apparently displaying a more archaic form of the *makâm* than others. Thus, three pieces in the *usûl* (rhythmic cycle) *darb-i fetih*, which appear near the beginning of the *Edvâr* (No. 12, 13, 14), and piece No. 93 (in the *usûl sakîl*),<sup>9</sup> are characterised by a pitch set derived almost entirely from the so-called “main notes” (*tamâm perdeleler*) of the modal system,<sup>10</sup> and use the eponymous “*sabâ*” pitch (*d*<sup>6</sup>) only in passing or cadential phrases. Other important features of this group are: a wide range (from *F*<sup>#</sup> to *a*) in the exposition,<sup>11</sup> the prominence of the mid to high register (from *d-a*), and a motive of a descending leap from *e* to *c*. As in later forms of *makâm sabâ*, the core range of the mode is from the finalis *A* to the dominant *c*. An outline of the modal characteristics of this group of pieces, which will be designated as “*sabâ* type 1”, is given in Example 1.

Pieces 42, 94, 96, 213, 276 and 338/343 constitute another group with rather different modal characteristics. The core area *A-c* is also prominent in these pieces, and the *e-c* motive occurs frequently. However, the exposition is confined to a smaller area, and the mid to high range (from *d-a*) is not exploited. Most significantly, the notes *f*<sup>#</sup> and *d* are replaced by *f* and *d*<sup>6</sup>, and this group of pieces therefore more closely resembles the modern form of *makâm sabâ*.<sup>12</sup> Another distinguishing feature of pieces in this group is an opening descent from *c* to *A*, while in *sabâ* type 1 the opposite occurs. An outline of the modal characteristics of *sabâ* type 2 is given in Example 2.

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Example 1. *Sabâ* type 1.Example 2. *Sabâ* type 2.

Wright [2000, p. 125–126] further suggests that the two remaining pieces in *makâm sabâ* (No. 92 and 95) may be viewed as intermediary, since they display characteristics of both modal types. The *Edvâr* repertoire, considered in isolation, thus gives us a picture of two distinct layers of historical development, with *sabâ* type 1 representing an older stage than type 2. The “older” group of pieces might therefore represent an obsolescent 17<sup>th</sup> century (or earlier) modal structure, while the “later” group might reflect the turn-of-the-century practices of Cantemir and his contemporaries. In order to test this hypothesis, and to trace the development of *makâm sabâ* in a more detailed manner, we can compare Cantemir’s transcriptions with the earlier versions of ‘Alî Ufîkî.

#### CANTEMIR AND ‘ALÎ UFKÎ: INTERPRETING DIFFERENCES IN NOTATION

In total there are six instrumental pieces in *sabâ* which were also notated by ‘Alî Ufîkî in the *Mecmû‘a-i Sâz ü Söz*<sup>13</sup> (*Edvâr* No. 12, 13, 14, 95, 96 and 276), two of which (12 and 96) are also included in the author’s earlier collection.<sup>14</sup> Of the pieces which we have assigned to *sabâ* type 1 above, 12, 13 and 14 appear in the *MSS*. In pieces 13 and 14 (*MSS* f<sup>o</sup> 88v and 89r), the ‘Alî Ufîkî version includes no accidentals, and thus gives no indication of the pitch alterations which are notated by Cantemir. An example is given below (Ex. 3), where the phrase *c d<sup>b</sup> c B<sup>b</sup> c B<sup>b</sup> A* in the *mîlâzîme* (M) of 14 is rendered with *d* by ‘Alî Ufîkî, and the passing use of *f*<sup>#</sup> in descent appears as *f*<sup>#</sup>.<sup>15</sup>

The omission of accidentals in the *MSS* may imply that the necessary pitch adjustments were simply made by ‘Alî Ufîkî during the course of performance, according to the orally transmitted rules of the *makâm*. However, *Edvâr* No. 12 (*MSS* f<sup>o</sup> 89v), which has the title “*Mîlâzîme-i hisâr*” in both sources, is notated by ‘Alî Ufîkî with a key signature at the beginning of M to indicate the unusual modulation which gives the piece its name.

Although the passing use of *f* in the first *hâne* (H1) of the *Edvâr* version does not appear in the *MSS*, in the third *hâne* (H3, not included in the *Edvâr*) the Arabic letter *ﺏ* is used to indicate *f* in place of *f*<sup>#</sup>. In addition, *Mîlâzîme-i hisâr* is also included in *Turc* 292 (f<sup>o</sup> 227r), where it is

marked with identical accidentals. It might be argued that the inclusion of accidentals in both ‘Alî Ufîkî versions of the piece is due to the unusual nature of the modulation, which could not be predicted by the rules of the nominal *makâm (sabâ)*. However, the choice to mark the passing *f* in H3 (in both *MSS* and *Turc* 292), while omitting the same pitch adjustment in H1 (as notated by Cantemir), implies a difference in performance practice rather than notational methods.<sup>16</sup>

The argument that the omission of accidentals in 13 and 14 is a difference in notational method or a case of scribal neglect,<sup>17</sup> while their inclusion in 12 is due to the exceptional *mîlâzîme* but is collaterally applied to H3, is also contradicted by ‘Alî Ufîkî’s version of 95 (*MSS* f<sup>o</sup> 88r). Although ‘Alî Ufîkî does not include accidentals for the *d<sup>b</sup>* of Cantemir’s version, and no modulation is indicated in H3, in Z (*zeyl*, a subsection following H2) *f* is given in place of *f*<sup>#</sup>.<sup>18</sup> Again, the inclusion of accidentals in a particular subsection, rather than their omission from the entire piece (as in 13 and 14), suggests a conscious decision on the part of the author.

Another important difference between the two versions of 95 is that, in H1, there is a significantly lower incidence of the pitch *d* (whether flat or natural) in the *MSS*.<sup>19</sup> Therefore, while in the *Edvâr* H1 is characterised melodically by the *c-d<sup>b</sup>* flexure, in the *MSS* it is the repeated emphasis of *c* which predominates (Ex. 4). If it is supposed that *d* was in fact played as *d<sup>b</sup>* in *makâm sabâ* by ‘Alî Ufîkî, this difference in emphasis could be interpreted as an avoidance of *d<sup>b</sup>* due to the limited number of pitches on his instrument, the *santûr*.<sup>20</sup> However, in Ma (see Example 3 and following) this pattern is reversed, and the *MSS* actually shows a higher incidence of *d* than the *Edvâr*.<sup>21</sup> The reversion from *d<sup>b</sup>* to *d* in Mb of the *Edvâr* version suggests the possibility that Ma could also have originally been played with *d*,<sup>22</sup> in which case it would be not be necessary for ‘Alî Ufîkî to avoid the pitch.

An even more striking example of the circumvention of *d<sup>b</sup>* is ‘Alî Ufîkî’s version of *Edvâr* No. 276 (*MSS* f<sup>o</sup> 87v).<sup>23</sup> Where H1 of the *Edvâr* version displays a similar melodic profile to 95 H1, with a strong focus on the *c-d<sup>b</sup>* flexure, the *MSS* does not show a single instance of *d* or

$d^b$ ; likewise in Ma cycle 2, the *MSS* gives  $c$  for Cantemir's  $d^b$ . Further, in cycles 5 and 7 of *Edvâr Mb* (in the *MSS*, Mc cycles 1 and 3) the alternation  $c d^b c d^b$  is rendered as  $c e c e$  by 'Alî Ufkî (Ex. 5).

If it is postulated that 12, 13 and 14 represent an earlier stage of modal development than 95 and 276, it might then be argued that the progression from *sabâ* type 1 to *sabâ* type 2 did not consist primarily in the introduction of  $d^b$ , but rather the predominance of  $c$  and the low incidence or circumvention of  $d$  (whether flat or natural). The introduction of  $d^b$  can thus be seen as having a purely ornamental function, as a consequence of the predominance of  $c$ , whose gravitational pull lowered the pitch of the note above it. On the other hand, if we accept that 'Alî Ufkî's notations reflect the tonal limitations of the *santûr*, and are therefore not an accurate indication of modal structure, the circumvention of  $d^{(b)}$  in the *MSS* would not represent a different stage of modal development from the *Edvâr*, but only a difference in instrumental technique, which moreover would demonstrate that the use of  $d^b$  in *sabâ* had already become common place.

This possibility, however, is undermined by an examination of the final piece in *makâm sabâ* which appears in both the *Edvâr* and the *MSS*, No. 96, in the rhythmic cycle *çenber* (*MSS* ♯ 90r).

This piece was also recorded by 'Alî Ufkî in *Turc 292* (♯ 226r), and thus can provide valuable comparative insights. As in the case of *Miülâzime-i hisâr* (*Edvâr* No. 12), in the *MSS* 'Alî Ufkî notates accidentals throughout the piece, clearly displaying  $d^b$  in Ma (*Edvâr Mb*),<sup>24</sup> and modulations to *şehnâz* and *hisâr* in H3. In *Turc 292*, the same accidentals are indicated, with slight but important differences. Whereas the *MSS* and *Turc 292* versions of *Miülâzime-i hisâr* are almost undifferentiated, and could therefore have been copied from one collection to the other, 96 displays several discrepancies,<sup>25</sup> suggesting that the two versions were notated independently. The fact that such discrepancies exist, but that the use of  $d^b$  and the modulations in H3 (not shown in Example 6) are notated almost identically, makes it reasonable to assume that the accidentals are a fairly accurate reflection of performance practice. Moreover, 'Alî Ufkî's transcription of this *peşrev* demonstrates that he was probably capable of playing pieces with a large number of pitch alterations.

Another interesting feature of 96 is Cantemir's ornamental use of  $f$  in Ma cycle 1, which brings the modal structure of the piece a step closer to *sabâ* type 2 as exemplified by e.g. *Edvâr* No. 42, and thus to the modern form. It is significant that this ornament does not occur in either of 'Alî Ufkî's notations, and is immediately preceded by a phrase using  $f^\#$ , which belongs to *sabâ*

type 1. Similarly, Cantemir's use of  $f$  in place of  $f^\#$  throughout H2 was evidently not a feature of the melody as 'Alî Ufkî knew it, and implies that the modal system was beginning to expand more frequently beyond the boundaries of the *tamâm perdeler*.

Although the 'Alî Ufkî versions of 96 confirm that  $d^b$  was already a feature of *makâm sabâ* in the mid-17<sup>th</sup> century, they also imply that it was not fully integrated into the pitch set. In H1b, 'Alî Ufkî explicitly indicates  $d^b$  in cycle 1 (in *Turc 292* only), and cycle 3 (in the *MSS* only), but omits it in H1a. In Ma,  $d^b$  is prominent, but in Mb it is either not indicated or circumvented. While it can reasonably be argued that later occurrences of the same melodic contour were to be understood as having the same pitch alterations applied, there is also no reason to assume (on the analogy of 95) that  $d$  could not alternate with  $d^b$ . In any case, 'Alî Ufkî's treatment of accidentals suggests that there must have been a certain amount of variability (or perhaps uncertainty) in practice, and this should be taken into consideration when attempting to trace modal development within the repertoire.

Rather than a straightforward diachronic progression from type 1 to type 2, it seems likely that, during the 17<sup>th</sup> century, *makâm sabâ* encompassed a variety of melodic practices which, from the viewpoint of strictly defined system of modes and pitch sets, appear to have been somewhat inconsistently applied. However, we could also argue that this variability itself was an integral feature of the mode, which may have contributed to its distinct musical character.

It is also worth noting that, while the "later" *sabâ* type 2 pieces we have examined (95, 96, 276) are composed in short rhythmic cycles, the "early" type 1 pieces (12, 13 and 14) share the rhythmic cycle *darb-i fetih*, which is the longest in the repertoire of *usûls* (comprising 88 time units). It has been noted by Feldman [1996, p. 316] that Cantemir seems to have regarded pieces in *darb-i fetih* as a distinct sub-genre, as they are discussed separately in the theoretical part of the *Edvâr*, and are grouped together at the beginning of the collection.

The majority of pieces in this group are attributed to the major mid-17<sup>th</sup> century composers (Muzafer, Şerif, Şolâkzâde), and thus do not suggest that the *usûl* had any particular associations with an earlier period. However, the length of the rhythmic cycle may well have influenced the melodic contour of these pieces, and the modal progression (i.e. extension to a higher register) that would be expected over several sub-sections of a piece with shorter cycles may occur in one cycle of *darb-i fetih*, since it allowed, or even demanded, more scope for development.

MSS  
M  
Edvâr

Example 3. *Edvâr* No. 14/MSS f° 89r.<sup>26</sup>

MSS  
H1  
Edvâr

M a

b

Example 4. *Edvâr* No. 95/MSS f° 88r.

MSS  
H1  
Edvâr

M a

b

c

Example 5. *Edvâr* No. 276/MSS f° 87v.

*Turc 292*  
H1/M

*MSS*  
III a

*Edvár*  
H1

The musical score consists of five systems of staves. The first system has three staves: Turc 292 (H1/M), MSS (III a), and Edvár (H1). The second system has three staves: Turc 292 (H1/M), MSS (III a), and Edvár (H1). The third system has three staves: Turc 292 (H1/M), MSS (III a), and Edvár (H1). The fourth system has three staves: Turc 292 (H1/M), MSS (III a), and Edvár (H1). The fifth system has three staves: Turc 292 (H1/M), MSS (III a), and Edvár (H1). The score includes treble and bass clefs, a key signature of one sharp (F#), and a 12/8 time signature. The first system shows the initial notation for each part. The second system includes asterisks above certain notes in the Turc 292 part. The third system shows further development of the parts. The fourth system continues the notation. The fifth system shows the final measures of the piece.

Example 6. *Edvár* No. 96/MSS  $\text{F}^\#$  90r.

## INSTRUMENTAL PIECES IN THE ‘ALĪ UFKĪ COLLECTIONS

There are four more instrumental pieces in *makâm sabâ* which appear in the *MSS* but not in the *Edvâr*. The first of these is untitled and is notated on the same page as *Mülâzime-i hisâr* (f<sup>o</sup> 89v), while the second, mentioned above, is entitled *At nakli* (“transportation of the horses”) and appears on the same page as ‘Alî Ufkî’s version of *Edvâr* No. 96 (f<sup>o</sup> 90r). The other two pieces are in the instrumental *semâ’î* genre (characterised by a 6-beat rhythmic cycle) and are also untitled (f<sup>os</sup> 90v and 96r). The *semâ’î* on f<sup>o</sup> 90v also appears in a partial, and substantially different, version in *Turc 292* (f<sup>o</sup> 48r). As might be expected, the pieces display features which would characterise them as “early”, though at the same time they show that aspects of *sabâ* type 2 had already begun to emerge during this period.

The characteristics of the first two *peşrevs* (on f<sup>os</sup> 89v and 90r) are consistent with *sabâ* type 1, and their absence from the *Edvâr* would also support the theory that they belong to an earlier historical layer (Ex. 7 & 8). The most important of these characteristics are an opening ascent from *A* to *c*, the use of *d* and *f*<sup>#</sup> in place of *d*<sup>b</sup> or *f*, and, in the *peşrev* on f<sup>o</sup> 90r, the use of the *e-g* range in the exposition.

These *peşrevs*, moreover, are distinguished from the other *sabâ* type 1 pieces in the *MSS* (*Edvâr* No. 12, 13, and 14) by their more limited range and the total avoidance of stepwise movement between *e* and *c*. These features, together with their melodic-rhythmic simplicity and short phrase lengths, could mark them out as being archaic even within the *sabâ* type 1 group. This argument would be congruent with Feldman’s [1996, p.322–327] early periodisation of pieces based on the absence of *seyîr* or “developed melodic progression”. However, we should also note that these pieces are appended to other *peşrevs* in the *MSS*, and may therefore have been intended to be performed as “light” works which followed more substantial compositions.<sup>27</sup> Furthermore, the title of the second *peşrev* indicates that it belonged to the *mehter* (military band) repertoire, which must also have affected its compositional and perhaps modal structure. Thus, differences in modal structure may equally be the result of functionality and performance context as of historical precedence.<sup>28</sup>

The *semâ’î* on *MSS* f<sup>o</sup> 90v (Ex. 9) initially appears to share certain features with 12, 13 and 14, but the appearance of another version of this piece in *Turc 292*, which includes both *d*<sup>b</sup> and the passing use of *f* in place of *f*<sup>#</sup> (H1/Mb cycles 6 & 10), distances the piece from *sabâ* type 1, and moreover seems to contradict the argument

that the use of accidentals in the *MSS* is an accurate reflection of performance practice. Similarly with *Edvâr* No. 96, which also occurs both in the *MSS* and *Turc 292*, differences in melody and ornamentation strongly suggest that the two versions were notated separately rather than copied. It must therefore be conceded that other pieces which give no indication of these pitches may well have included them in practice (though it is impossible to say with what frequency), and we can also be sure that *f* had at least begun to be introduced into *makâm sabâ* in the mid-17<sup>th</sup> century as a passing pitch alteration (probably limited to descending melodic contexts), although only two examples in the entire *sabâ* corpus<sup>29</sup> of the *MSS* and *Turc 292* suggest that it was not yet fully integrated into the structure of the *makâm*.

Nonetheless, the evidence of the other pieces we have analysed, and indeed the fact that ‘Alî Ufkî notated two quite different versions of this *semâ’î*, demonstrates that there was considerable variability within the structure of the mode, and, where no explicit indication is given in the score, an indiscriminate and retrospective application of the modern pitch set (i.e. with *d*<sup>b</sup> and *f*) of *makâm sabâ* therefore remains inappropriate. Rather than being a straightforward case of neglect on the part of the author (which seems unlikely considering the care with which the *MSS* was prepared in comparison to *Turc 292*), the fact that the notation of *d*<sup>b</sup> was not regarded as obligatory implies that there was considerable latitude in its practical application.

The absence of accidentals in the *MSS* version could, for example, indicate that the *semâ’î* (as a whole or in certain sections) was sometimes played with *d* and sometimes with *d*<sup>b</sup> depending on instrumentation, tempo, or placement within a performance. The coexistence of *d* and *d*<sup>b</sup> is evidenced by the *semâ’î* on f<sup>o</sup> 96r (Ex. 10), where *d*<sup>b</sup> is written as *c*<sup>#</sup>.<sup>30</sup>

The likelihood of the inconsistent appearance of this pitch in the *MSS* being due to scribal inaccuracy is further reduced by the notational convention adopted in this piece, which clearly demonstrates that *d*<sup>b</sup> had been introduced by the mid-17<sup>th</sup> century, but had not yet replaced *d*. It is significant that the use of *d*<sup>b</sup> here coincides with another important feature of *sabâ* type 2, the initial descent from *c* to *A* in H1. However, there are important differences between this *semâ’î* and those pieces in the *Edvâr* which are most representative of *sabâ* type 2 (No. 42, 213 and 338/343). Apart from the alternation of *d* with *d*<sup>b</sup>, other characteristics which differentiate this piece from the later examples of *sabâ* type 2, and thus suggest an earlier phase of modal development, are the absence of *f* and the use of the *e-g* range in M.

[H1] M

[H2] 1. 2.

[H3]

Example 7. MSS f 89v.

H1

[M]

H2

H3

Example 8. MSS f 90r "At nakli".

Ture 292  
H1/M a  
MSS

b

b

b

c

[?]

Example 9. MSS f° 90v (*semâ?*).

It is noteworthy that the only other instrumental piece in *makâm sabâ* the *MSS* which explicitly indicates  $d^b$ , on f° 90r (*Edvâr* No. 96), includes an almost identical opening phrase in M. This feature also distinguishes these two pieces from *Edvâr* No. 95 (*MSS* f° 88r) and 276 (*MSS* f° 87v), which do not rise above  $e$  in their exposition, and thus do not include  $f^\#$ . Since the use of the  $e$ - $g$  range (including  $f^\#$ ) is a prominent feature of the “early” pieces, and does not occur in 42, 213 or 338/343, it might be argued that its occurrence in 96, as well as the *semâî* on f° 96r, indicates an earlier provenance than 95 or 276. However, this fails to explain the complete absence of accidentals to indicate  $d^b$  in 95 and 276, and it seems unlikely that, once  $d^b$  had been introduced, new pieces in *makâm sabâ* could have been composed exclusively with  $d$ . If, of course, 95 and 276 were played with  $d^b$  in the mid-17<sup>th</sup> century, they would already be closely identifiable with *sabâ* type 2. But if, as has been argued previously, the indications of  $d^b$  in the *MSS* largely represent contemporary performance practice, 95 and 276 are unlikely to be antecedent to 96 or the *semâî* on f° 96r. The occurrence of the  $e$ - $g$  range in these latter two pieces would therefore seem to be vestigial, particularly since it occurs only in passing, rather than structurally as in 12, 13 or 14.

The preceding discussion demonstrates perhaps most clearly the difficulty of accurately dating pieces based on their modal characteristics, since in some contexts these may have persisted despite belonging to an earlier historical layer. The fact that both ‘Alî Ufkî and Cantemir notated such a wide range of modal structures under a single rubric demonstrates that there was considerable scope for diversity in practice, and, in the case of ‘Alî Ufkî, inconsistencies in notation may indicate ambiguity or flexibility rather than inaccuracy. It is also worth considering that, since the ‘Alî Ufkî collections are the only notated documents we have for the early and mid-17<sup>th</sup> century, it is quite plausible (if not inevitable) that other musicians played the same pieces in different ways, according to their tastes and musical education.

Although 95 and 276, for example, seem to have been played by ‘Alî Ufkî without  $d^b$ , they may well have been played with this pitch by other musicians – perhaps of a younger generation, different line of transmission or musical background – and it was seemingly this practice which had become standard by the time of Cantemir. Therefore, while there clearly exists evidence of diachronic layering within the *sabâ* corpus, the various threads that make up the fabric of the *makâm* in the 17<sup>th</sup> century are also indicative of a level of synchronic diversity, and, at least with regards to some modal types, point to the period as one of musical flux rather than conservatism.

## VOCAL PIECES IN THE ‘ALÎ UFKÎ COLLECTIONS

The corpus of pieces assigned to *makâm sabâ* in the *MSS* includes eight vocal compositions, while one vocal piece in *Turc* 292 is entitled (in Latin script) “*mekam sabah*” (f° 265v). The latter appears to be something of a misnomer, however, since its melodic shape is quite unrelated to the two other (instrumental) pieces assigned to *makâm sabâ* in *Turc* 292. Although the fact that ‘Alî Ufkî explicitly indicates that the piece was in *sabâ* may suggest that there was yet another modally distinct form of the *makâm* which existed in the early or mid-17<sup>th</sup> century, in the absence of any further evidence this argument is untenable. Amongst the vocal pieces in *makâm sabâ* in the *MSS* are five *murabba*’s (f°s 92v-93r),<sup>31</sup> a *türkü* or popular song (f° 93r), and two hymns (*tesbîh*) (f° 94r) (Ex. 11.1-8). The pieces display some of the features that characterise the “early” instrumental repertoire, yet they also deviate from the *sabâ* type 1 model in important ways. This may be significant in terms of chronology, but is also likely to reflect the differing requirements of the vocal repertoire, and suggests an alternative path of modal development.

The formal limitations of the vocal genres are a factor in the modal structure of these pieces: all forms contain only two short sections (generally performed in the sequence AABA, with B as a contrasting section), with no subsections as in the *peşrev*, and melodic development is therefore usually restricted to 2-4 phrases. This may account for the narrow *tessitura* of all the vocal pieces – apart from *murabba*’ V on f° 93r,<sup>32</sup> which briefly touches  $f^\#$ , none of the pieces extend beyond  $e$  in the *zemîn*<sup>33</sup> section, and the *türkü* on f° 93r only reaches  $c$ . Extension to the upper register (centred on  $e$ ) occurs in the *miyân* of most pieces, though *murabba*’s I & II (f° 92v) instead modulate by introducing  $c^\#$ ,<sup>34</sup> and the B section of the *türkü* is simply a variation of the first section. Other features of *sabâ* type 1 are present, but can not be generalised to all the vocal pieces.

Thus, although in almost all pieces  $c$  has the expected prominence, *murabba*’ V does not conform to this pattern, and, while most pieces ascend from A to  $c$  in the *zemîn*, *murabba*’ II and *tesbîh* II (f° 94r) have a descending melodic profile; *murabba*’ III (f° 92v) and the *türkü* both begin with an ascending leap from G. Furthermore, the descending  $e$ - $c$  leap, which is one of the most distinguishing characteristics of *makâm sabâ* in the 17<sup>th</sup> century (appearing in all except one of the instrumental pieces in the *MSS*), does not occur in half of the pieces,<sup>35</sup> and in two of the pieces where it does appear (*murabba*’ II & *tesbîh* II), it is in the configuration  $d$ - $e$ - $c$ , rather than the more usual  $c$ - $e$ - $c$  or  $f^\#$ - $e$ - $c$ .

The musical score is written in 6/8 time with a key signature of one sharp (F#). It consists of eight staves of music. The first two staves are labeled 'H1' and the last two 'H3'. The middle two staves are unlabeled. The music features various melodic motifs, including a prominent e-c leap in the first staff. The score includes first and second endings for several phrases.

Example 10. MSS f° 96r (*semâ'î*).

One vocal piece (*murabba*<sup>c</sup> IV on f° 93r) includes a single accidental to indicate *d'*, which occurs cadentially following the *e-c* motive, but the remaining pieces do not appear to use this pitch.

The vocal pieces in the *MSS* seem to represent a similar phase of development to the two *peşrevs* on f°s 89v and 90r, discussed above. That is, they clearly are closer to *sabâ* type 1 than type 2, but at the same time display a

more limited range and simpler melodic construction than the *darb-i fetih* pieces.

Indeed, the melodic range of the vocal pieces is even narrower than the *peşrevs* on f°s 89v and 90r, and, in addition, the distinctive *e-c* leap is absent from many of them, which could indicate a stage prior to the establishment of this motive as a core feature of the *makâm*.

[A]  $\text{MSS } f^{\circ} 92v$  (*murabba' I/[evfer]*).<sup>36</sup>

[B]

Example 11.1. MSS  $f^{\circ} 92v$  (*murabba' I/[evfer]*).<sup>36</sup>

[A]  $\text{MSS } f^{\circ} 92v$  (*murabba' II/[sofyân]*).<sup>37</sup>

[B]

Example 11.2. MSS  $f^{\circ} 92v$  (*murabba' II/[sofyân]*).<sup>37</sup>

[A]  $\text{MSS } f^{\circ} 92v$  (*murabba' III/[semâ]*).

[B]

Example 11.3. MSS  $f^{\circ} 92v$  (*murabba' III/[semâ]*).

[A]  $\text{MSS } f^{\circ} 93r$  (*murabba' IV/[diyek?]*).<sup>38</sup>

[B]

Example 11.4. MSS  $f^{\circ} 93r$  (*murabba' IV/[diyek?]*).<sup>38</sup>

[A]  $\text{MSS } f^{\circ} 93r$  (*murabba' V/[diyek]*).<sup>39</sup>

[B]

Example 11.5. MSS  $f^{\circ} 93r$  (*murabba' V/[diyek]*).<sup>39</sup>

Example 11.6. MSS f° 93r (*türkü/semâî*).<sup>40</sup>

Example 11.7. MSS f° 94r (*tesbîh I/[diyek?]*).<sup>41</sup>

Example 11.8. MSS f° 94r (*tesbîh II/[semâî?]*).<sup>42</sup>

*Murabbaʿ* IV on f° 93r gives the only example of a cadential rather than structural use of  $d^b$  in the pieces in *makâm sabâ* notated by ʿAlî Ufkî, which later occurs in the “early” pieces as they were notated by Cantemir (in No. 13 and 14).

This illustrates the emergence of the pitch as a passing alteration in a cadential context, before it began to be used more consistently and prominently as in the *semâî* on f° 96r.

Feldman [1996, p. 181] has stated that the *murabbaʿ* (*beste*) emerged during the late 16<sup>th</sup> and early 17<sup>th</sup> centuries, and, while the basis for this assertion is not made clear, it is certainly true that the earliest Ottoman song-text collections (ca. 1650) reflect the establishment of the genre as a distinctly Turkish form; the term is not noted in mid-16<sup>th</sup> century collections [Wright, 1992, p. 215].

Therefore, if the vocal pieces do represent the most archaic phase of modal development in the *MSS*, this cannot be earlier than the late 16<sup>th</sup> century. However, as

with the instrumental pieces discussed in the previous section, it is uncertain whether the modal structure of the vocal pieces is a reflection of their early composition, of formal constraints, of performance function, or a combination of these factors. It might be argued that the inherently more conservative nature of the vocal repertoire is evidenced by the modal characteristics of these pieces, which do not include the extended range and typical motivic features which were developed in the instrumental repertoire. On the other hand, the long note values with which several of these pieces were originally written might also imply that they were intended as melodic outlines, to be elaborated by the performer.

Yet, although many of these pieces are melodically and rhythmically limited compared to the instrumental works we have considered so far, some pieces (e.g. *tesbîh* II) have a modal structure which is comparable to the *MSS* versions of 95 and 276, though somewhat more condensed. The limited range of the latter two instrumental pieces is not, therefore, necessarily indicative

of a late stage of development. Indeed, the evidence of the vocal pieces makes it more plausible that the extended range in the exposition of pieces 12, 13, 14 is related rather to the formal requirements of the *usûl*. Another important feature of *sabâ* type 2, the initial descent from *c* to *A*, can also be seen in the *murabbaʿ* II, which does not give any other indication of being a “late” composition. The evidence of these vocal pieces demonstrates that the early 17<sup>th</sup> century repertoire does not necessarily conform to the melodic profile of *makâm sabâ* seen in the *Edvâr* corpus. Although it can be said that these pieces correspond more closely to *sabâ* type 1 than type 2, an analysis of their modal characteristics – some of which might be related to historical factors, while others may be attributable to the formal limitations or performance function of the vocal repertoire – obliges us to broaden our definition of the structure of the mode, and perhaps to adhere less strictly to such a chronological/typological distinction.

## CONCLUSIONS

This study has attempted to outline the structural development of *makâm sabâ* during the 17<sup>th</sup> century. Pieces 95 and 276 display more archaic features in the *MSS* than the *Edvâr*, and it has been suggested that early forms of *makâm sabâ* were defined by the emphasis of *c* and low incidence or circumvention of *d*, rather than the use of *d*<sup>♭</sup>. However, it has been demonstrated with reference to 96 (as well as several other pieces in the *MSS* and *Turc 292*) that *d*<sup>♭</sup> had begun to emerge in the mid-17<sup>th</sup> century, though it had not yet been established as an essential feature of the mode. In most pieces in the *MSS* or *Turc 292* in which *d*<sup>♭</sup> is introduced, it is the alternation of this pitch with *d* rather than the consistent use of *d*<sup>♭</sup> which characterises this stage of modal development. The almost complete absence of *f* in the ʿAlî Ufkî repertoire, its introduction in the *Edvâr* version of 96, and the absence of *f*<sup>♯</sup> from later pieces, demonstrate that, while it was occasionally used in *makâm sabâ* in the mid-17<sup>th</sup> century, *f* had become a more integral feature of the mode by the end of the century.

We have aimed to interpret ʿAlî Ufkî’s use of accidentals, and it has been postulated that these reflect the performance practices of his time. Although the example of a *semâʿî* recorded both in *Turc 292* (with *d*<sup>♭</sup>) and the *MSS* (with *d*) implies that pitch alterations were not always notated, it has been argued that such inconsistencies themselves demonstrate a level of variability in performance. It is also probable that the ʿAlî Ufkî notations represent only one of several different musical practices, which are likely to have varied

according to the background of individual teachers and musicians.

The instrumental and vocal pieces of *Turc 292* and the *MSS* which do not appear in the *Edvâr* display seemingly archaic features, but it has been argued that modal structure is influenced by various factors apart from historical development. One of the pieces we have discussed is linked to the music of the janissary band, while others may have been intended as light compositions with which to end a performance, and these differing contexts should be considered in musical analysis. Furthermore, the formal limitations of particular genres and the length of rhythmic cycle are likely to have contributed to the modal characteristics of certain pieces. In particular, vocal compositions seem to be sharply distinguished from the instrumental repertoire, which may reflect the more conservative nature of vocal music as well as its formal limitations. However, the most archaic examples of vocal music in *makâm sabâ* in the *MSS* cannot be considered to date from earlier than the late 16<sup>th</sup> or early 17<sup>th</sup> century.

In conclusion, the analysis of the *sabâ* pieces in the *Edvâr* by Wright [2000, p. 124–133] is largely borne out by a comparison with the *MSS* and *Turc 292*, but an examination of other pieces assigned to *makâm sabâ* by ʿAlî Ufkî shows that a larger amount of data results in an even more variable conception of the structure of the mode. Wright’s [2000, p. 128] suggestion that a degree of historical layering had already taken place in *makâm sabâ* by the mid-17<sup>th</sup> century is supported by a more detailed evaluation of *Turc 292* and the *MSS*, which demonstrate that aspects of *sabâ* type 2 had already begun to emerge in the mid-17<sup>th</sup> century or earlier. Nonetheless, the mode displays a more heterogeneous form than is found in the *Edvâr* corpus, and this may be related not only to historical development, but also to other factors such as performance context, genre, instrumentation, or rhythmic structure.

The case of *makâm sabâ* in the early Ottoman repertoire demonstrates that the 17<sup>th</sup> century was a period of continuous musical development, which can only be hinted at in the surviving collections of notation. In the Ottoman tradition, the scarcity of notation before the 19<sup>th</sup> century means that any analysis of the early modal system is speculative and incomplete, and is in danger of limiting modality to its textual remains. However, by reversing this perspective and viewing the notated sources as a reflection of a living musical tradition, we can question the notion of modality as a static and predefined system, and instead consider the early Ottoman collections as embodying a diversity of practices within a changing and changeable musical culture.

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## Notes

<sup>1</sup> I am grateful to Owen Wright for providing valuable sources and suggestions during the writing of this article.

<sup>2</sup> Generally, modern Turkish spellings of extant musical terms are adopted in the text. In the case of personal names, titles of pieces, or where there is a direct reference to an Ottoman Turkish text, the transcription system of the *İslam Ansiklopedisi* is used.

<sup>3</sup> ‘Alî Ufkî (ca. 1610-75), known as Albert Bobowski or Bobovius in Western sources, was a Polish polymath who was brought as a captive to Istanbul sometime before 1650. He served as a court musician (playing the hammered dulcimer, *santûr*) at the Topkapı palace for a number of years, where he made the earliest known notations of Ottoman music (see note No. 5). See [Behar, 1990] and [Elçin and Ufkî, 1976].

<sup>4</sup> Demetrius Cantemir (1673-1723) was a Moldavian prince who was resident – as a hostage – in Istanbul between 1687-91 and 1693-1710. As well as producing an influential history of the Ottoman empire in Latin, he holds an important place as the author of a musical treatise which provides unparalleled information on 17<sup>th</sup> century Ottoman music, *Kitâb-i ‘ilm-i müsikî ‘alâ vechü’l-‘hurûfât* (“Book of the Science of Music by Means of Notation” – İstanbul Üniversitesi Türkiyat Araştırmaları Enstitüsü Kütüphanesi, Yazmalar No. 100). A collection of around 350 instrumental pieces written in alphabetic notation is appended to the treatise. For further information see [Cantemir and Wright, 1992; 2000] and [Popescu-Judet, 1999].

<sup>5</sup> The better known of these is the *Mecmûa-i Sâz ü Söz* (British Library, MS. Sloane 3114), containing around 475 notated works in various vocal and instrumental forms (see [Behar, 2005, p. 213–214]). The second (Bibliothèque Nationale de France, MS. Turc 292) is untitled; it contains a large quantity of miscellaneous material unrelated to music, in addition to around 290 vocal and instrumental notations [Behar, 2005, p. 224–226]. Although it is generally acknowledged that the latter work predates the *Mecmûa-i Sâz ü Söz*, there is much evidence to suggest that it could not have been completed before 1650 [Behar, 2008, p. 36–43; Wright, 1992, p. 7]. For the purposes of this study,

therefore, the two collections will not be considered as representing different historical periods or stages of modal development.

<sup>6</sup> Henceforth referred to as the *Eđvâr* (“[the book of] cycles”) – the title by which the treatise and accompanying collection of notations are commonly known in Turkey.

<sup>7</sup> See [Behar, 2008].

<sup>8</sup> Most notably, Wright [2000] and Feldman [1996].

<sup>9</sup> Transcriptions of all pieces from the *Eđvâr* which are discussed in this study may be consulted in [Cantemir and Wright, 1992].

<sup>10</sup> In accordance with modern Turkish notational conventions, the sixteen *tamâm perdeler* as given by Cantemir in the *Eđvâr* (p. 2) are: *D E F# G A B#c d e f# g a b#c’ d’ e’*. See Wright [2000, p. 15–17] for more detailed discussion.

<sup>11</sup> The main Ottoman instrumental genres featured in this study (*pesrev* and *semâ*) both consist of a ritornello (*mülâzime*) and at least three other sections (*hânes*), usually in the form AB(= *mülâzime*)CBDB (see [Feldman, 1996, p. 303–338]). “Exposition” here includes the first *hâne* and the *mülâzime*.

<sup>12</sup> For the modern form of *makâm sabâ*, the reader may consult [Özkan, 2006, p. 369–373]. See also [Yılmaz, 2007, p. 203–205]; [Signell, 2008, p. 63–65]; [Yekta Bey, 1922, p. 2998].

<sup>13</sup> Henceforth *MSS*.

<sup>14</sup> Henceforth *Turc 292*.

<sup>15</sup> Presuming that ‘Alî Ufkî’s “natural scale” consisted of the same pitches as Cantemir’s *tamâm perdeler* (see [Wright, 2000, p. 15–17]). Transcriptions from the *MSS* are notated here with an editorial *B<sup>6</sup>* and *f<sup>#</sup>* in the key signature to reflect this assumption. Although the *MSS* does not include any indication of the tuning system with which ‘Alî Ufkî was familiar, *Turc 292* includes a “scale of the frets of the *tanbûr*” on f° 74r. However, [Behar, 2008, p. 170] has dismissed (perhaps somewhat rashly) any attempt to gain insight into the 17<sup>th</sup> century pitch system from this diagram as being in vain.

<sup>16</sup> Feldman also argues that “the fact that he [‘Alî Ufîkî] did indicate accidentals fairly frequently [i.e. did not omit them entirely] suggests that the relative scarcity of accidentals in his notations is a faithful reflection of the musical style of the first half of the 17<sup>th</sup> century” – [Feldman, 1996, p. 417]. For Wright [2000, p. 128], however, ‘Alî Ufîkî’s treatment of accidentals is “somewhat cavalier”, and should not be considered an accurate representation of performance practice.

<sup>17</sup> One might argue, for example, that, since accidentals are marked in a different coloured ink from the main text in the *MSS*, the author intended to add them at a later stage but forgot.

<sup>18</sup> The Arabic letter  $\sphericalangle$  appears on the relevant line of the stave at the beginning of the subsection.

<sup>19</sup> In the *MSS*, the incidence of  $d$  in H1 is 2 time units (or 3 in the repeat with *seconda volta*), as against 4.5 time units for  $d^b$  in the corresponding subsection in the *Eđvâr* (where  $\downarrow$  = one time unit).

<sup>20</sup> Unfortunately, detailed information about the tuning system of the 17<sup>th</sup> century *santûr* is unavailable. However, the illustration of a *santûr* in the *Sâznâme* of Hızır Ağa (mid-18<sup>th</sup> century), shows an instrument with movable bridges, but little possibility for easy adjustments of intonation during the course of performance – this practical difficulty may have led to the avoidance of  $d^b$  in a piece which predominantly used  $d$ . Feldman has argued that the decline of the *santûr* was directly related to the expansion of the Turkish tonal system at the end of the 18<sup>th</sup> and the beginning of the 19<sup>th</sup> century (see Feldman [1996, p. 160–163]).

<sup>21</sup> *MSS*: 7.5 time units (7 for the *seconda volta*); *Eđvâr*: 5 time units.

<sup>22</sup> In support of this hypothesis we might draw a comparison with the other “intermediate” piece, *Eđvâr* No. 92 (not included in *MSS* or *Turc 292*), in which  $d^b$  is used in H1 but is replaced by  $d$  in M.

<sup>23</sup> The title of this piece is given in the *Eđvâr* as *Reftâr* (“graceful gait”). In the *MSS* this title is absent, but another hand has added *Dilnûvâz* (“heart’s ease”).

<sup>24</sup> Wright’s comment that “the editorial preference for  $d^b$  in the transcription of 96 Mb ... cannot be argued for on a strict reading of ‘Alî Ufîkî’s text” [Wright, 2000, p. 128] would thus seem to be an oversight.

<sup>25</sup> These are marked with asterisks in the comparative transcription (Ex. 6).

<sup>26</sup> Notes on transcriptions: Where no key signature is provided in the *MSS* or *Turc 292*,  $B^b$  and  $F^b$  have been given on the assumption that this reflects the basic pitch set of the 17<sup>th</sup> century; in pieces from the *Eđvâr*, accidentals reflect the transcription system adopted by Wright [1992]. In pieces from the *MSS* or *Turc 292*, # represents the signs #, /, or / of the original, and  $\flat$  represents the signs  $\flat$ ,  $\flat$  or  $\sphericalangle$ . Pieces from the *MSS* and *Turc 292* are generally transcribed with smaller note values than the original to facilitate comparison with the *Eđvâr* versions; likewise, where a repeated cycle or subsection which is written out in full in the *Eđvâr* is written with a repeat sign in the *MSS* or *Turc 292*, it has been transcribed in full here to aid comparison. Bar lines (apart from repeat bar lines) are rarely indicated in the *MSS* or *Turc 292*, and are therefore added here in accordance with the length of the relevant rhythmic cycle.

<sup>27</sup> Feldman himself [1996, p. 183] also argues that, within the 17<sup>th</sup> century instrumental *fasl* (suite), pieces with short *usûls* such as *diyek* were preceded by pieces in longer rhythmic cycles e.g. *darb-i fetûh*.

<sup>28</sup> In this regard, Wright [2000, p. 546] notes that any attempt to establish a chronology within the early Ottoman repertoire must

“avoid the pitfall of assigning pieces to different periods merely on the basis of relative simplicity and complexity, however defined”.

<sup>29</sup> Not including second and third *hânes*.

<sup>30</sup> The use of  $c^\#$  to indicate  $d^b$  may be related to the tuning system of the *santûr*, and might reflect a method of producing the desired pitch by pressing on the  $c$  string (rather than having to tune the  $d$  string down by half a tone), perhaps necessitated by the faster tempo of the *semâ’î* compared to the *peşrev*. I am indebted to Mehmet Uğur Ekinci for suggesting this interpretation.

<sup>31</sup> The *murabba’* (also known as *beste*) was the main vocal genre in Ottoman music during the 17<sup>th</sup> century, and is among the more “classical” vocal forms notated by ‘Alî Ufîkî (see [Feldman, 1996, p. 177–178; Wright, 1992, p. 157–158]). It has been noted by various scholars that the *MSS* displays a wide range of vocal forms, including genres such as the *murabba’* alongside popular and religious song types such as the *tîrkîi* or *ilâhî* (see [Behar, 2008, p. 51–71] for more detailed discussion). It is therefore interesting to note that only one example of a popular genre, the *tîrkîi*, is included amongst the pieces in *makâm sabâ*, compared with e.g. the *hüseynî* mode section, which includes 16 *tîrkîis* and 5 *varsâğis*, but only 10 *murabba’*s (see Wright [1992, p. 150]).

<sup>32</sup> Vocal pieces are referred to here by Roman numerals (i.e. *murabba’* I–V and *tesbîh* I–II) according to their order of appearance in the *MSS*.

<sup>33</sup> *Zemîn* (“ground”) refers to the first section (A) of a vocal composition. The contrasting section (B) is referred to as *miyân* (“middle”).

<sup>34</sup> It is not clear which *makâm* this rather unusual modulation refers to – possible candidates might be *uzzâl* or *pençgâh*, but the melodic shape would seem atypical in both instances. In any case, the brevity of the relevant passages prevents any conclusive analysis.

<sup>35</sup> The  $e$ - $c$  leap does not occur in *murabba’*s I, III & V and the *tîrkîi*.

<sup>36</sup> The *usûl* is not indicated, but the following pieces (*murabba’*s II & III) are assigned to *evfer* and *sofyân* respectively. The internal rhythmic articulations, however, make clear that these headings in fact apply to *murabba’*s I & II, while *murabba’* III is given the time signature  $\nabla$  and *semâ’î* is written in the margin. Repeat bar lines are not given in *murabba’* I, but repeats are implied by *seconda* & *terza volta* endings, of which one of several possible interpretations is given here. Bar line divisions are also editorial.

<sup>37</sup> Repeats are not indicated, but are implied by the *seconda volta* ending, for which the original has  $\downarrow$  (replaced here by  $\downarrow$  to allow for the following anacrusis).

<sup>38</sup> The *usûl* is not indicated. An extra minim has been added in section A, cycle I, by analogy with section B, cycle I. Above the heading is written “*rakş*” (“dance”).

<sup>39</sup> A transcription of this piece is found in [Wright, 1992, p. 166], where it is suggested that the same piece may be recorded in the song text collection of Hâfîz Post.

<sup>40</sup> The *usûl* is indicated with the time signature  $\nabla$ . The final note of each section is  $\downarrow$  (rather than  $\downarrow$ ) in the original. The finalis seems to be G, in which case the only feature which links this piece to *makâm sabâ* is the emphasis of  $c$ . However, since the piece is notated in the *sabâ* section it may also be a scribal error.

<sup>41</sup> The *usûl* (indicated by the time signature  $\nabla$ ) is clearly a duple metre. *Diyeğ* has been chosen here as one of several possibilities.

<sup>42</sup> The *usûl* is not indicated.

## LA MODALITÉ ÉCRITE

### UN EXEMPLE AVEC MĪKHĀ'ĪL MASHĀQA

#### AU XIX<sup>e</sup> SIÈCLE

Rosy Azar Beyhom\*

Si la « modalité » reste de nos jours un concept à définir, que ce soit dans le contexte de la musique arabe ou dans d'autres musiques, c'est que les théoriciens du passé ne semblent pas l'avoir fait pour nous dans leurs traités ; du moins est-ce ce que nous avons pu constater.

L'on pourrait se demander pourquoi les anciens Arabes n'auraient pas jugé opportun de préciser ce qui, pour eux, aurait été jugé « modal ». Une des réponses possibles à cette question serait qu'ils auraient été plutôt préoccupés à jouir de la musique qui les aurait entourés, ou bien, pour certains, à composer, pour un dignitaire, la mélodie qui aurait été la plus parfaite, faisant le tour du monde, même copiée et plagiée, pour la plus grande joie<sup>1</sup> de son auteur.

Il est fort possible aussi que cela aurait été tout simplement parce qu'ils n'auraient pas eu besoin d'y réfléchir et n'auraient pas perçu la nécessité d'en trouver une définition. On questionne difficilement un état normal dont on est entouré au quotidien, que ce soit à la cour de rois, de califes ou dans les rues du marché. Tout ce qu'on aurait chanté ou joué aurait été modal.

De nos jours, ceci n'est plus le cas<sup>2</sup>, et il nous semble que cette façon de penser est la cause principale qui mène les chercheurs à vouloir trouver une définition pour le terme « modalité ».

Les théoriciens de la musique arabe ont, pour la plupart, laissé des indices dans leurs traités qui auraient pu contribuer à la restitution de cette définition. On trouve notamment des descriptions d'échelles<sup>3</sup>, des dévoilements furtifs d'une pratique qui n'est pas souvent explicite<sup>4</sup> ou d'autres allant dans le sens d'une description de la pratique mélodique et correspondant, peut-être, à ce que nous pourrions, aujourd'hui, appeler « modalité ».

Ailleurs, on trouve aussi, et à titre d'exemple, un exercice de *'ūd* chez (al-) Kindī<sup>5</sup>, un *ṣawt*<sup>6</sup> chez (al-)

Urmawī, et une description littéraire d'échelles et/ou de modes chez Mashāqa<sup>7</sup>.

Nous nous sommes intéressée aux descriptions de Mikhā'il Mashāqa<sup>8</sup> au cours de recherches sur la musique arabe de l'époque moderne. Et c'était frappant de remarquer les différences de perception, et par suite d'interprétation et d'analyse, dans différents essais sur l'épître musicale de ce théoricien.

Le propos de cet article est de relever ces différences et ces aboutissements, tout en essayant de fournir au lecteur les indices dont il aurait besoin afin de décider pour lui-même ce qui lui semblerait le plus proche de ce que Mashāqa aurait voulu exprimer en son temps<sup>9</sup>.

### L'APPORT DE MĪKHĀ'ĪL MASHĀQA

#### À LA MUSIQUE ARABE

Les théories modernes de la musique arabe auraient débuté par les écrits de Mashāqa au XIX<sup>e</sup> siècle<sup>10</sup>. Cette modernité est exprimée à travers l'introduction de ce théoricien dès « la première formulation rationnelle du modèle de division de l'octave en vingt-quatre quarts de ton égaux »<sup>11</sup>. Ceci a été clarifié par les musicologues contemporains<sup>12</sup> qui ont montré que ce système en vingt-quatre quarts ne pouvait être que théorique, en se basant par exemple sur le fait que Mashāqa avait écrit clairement dans son traité que ce système existait bien avant son temps<sup>13</sup>. De même, dans la partie théorique de son épître, l'auteur ne cite pas le quart de ton en tant qu'entité dans son système<sup>14</sup> et ne parle que de tons et de trois-quarts de ton.

Farmer a mentionné Mashāqa dans un article sur l'histoire de l'échelle musicale arabe et trouve que :

« [Mashāqa] essaya d'établir le quart de ton comme base régulière pour avoir une échelle tempérée égale »<sup>15</sup>.

Cette constatation erronée a perduré avant qu'elle ne soit corrigée par les musicologues contemporains.

Erlanger, de son côté, considère que Mashāqa représentait :

« l'esprit scientifique moderne généralement ignoré à cette époque à Damas »<sup>16</sup>.

### CE QUI NOUS EST PARVENU DE MASHĀQA

Mashāqa a écrit un traité musical intitulé *Épître à l'Émir Shihab*<sup>17</sup> /الرسالة الشهادية في الصناعة الموسيقية/. Ce manuscrit a été traduit et publié en anglais pour la première fois par Eli Smith en 1849. Ce fut ensuite au tour de Louis Ronzevalle, en 1899, de proposer une édition arabe commentée et, ultérieurement en 1913, une édition et traduction en langue française suivies quelques décennies plus tard par une édition arabe d'Isis Fath-al-Lāh (en 1996). Enfin, en 2007, Nidaa Abou Mrad publiait un article autour de ce traité.

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Quant aux manuscrits que nous avons pu retrouver, nous possédons trois versions du même ouvrage : les copies numériques des manuscrits BO 220 et BO 221 qui nous ont aimablement été transmis par la Bibliothèque Orientale de Beyrouth ainsi que, découvert par le plus grand des hasards, un troisième manuscrit<sup>18</sup>, au Sud du Liban. Ce manuscrit porte le numéro OBS\_1741.

À l'aide de ces trois copies, nous tenterons de comprendre comment les éditions de ce traité ont été conçues et si les indications de Mashāqa ont été respectées.

Nous porterons notre attention sur un paragraphe simple mais dont les problèmes d'édition et de traduction se sont révélés caractéristiques d'un paupérisme musicologique<sup>19</sup> au sujet du *maqām*. Le paragraphe en question concerne le mode *Dūkā*<sup>20</sup> retrouvé chez Mashāqa dans son épître au chapitre cinq de la seconde partie sous l'intitulé : « Des *alḥān* [modes, mélodies]<sup>21</sup> dont le *qarār* [tonique, teneur, fondamentale] est sur le *burj* [degré, position] *dūkā*<sup>22</sup> » / في الألحان التي يكون قرارها على / برج الدوكاه. Dans ce paragraphe, Mashāqa propose une suite de degrés qui expliciteraient pour lui le mode en question. Cette énonciation des degrés représenterait pour nous un exemple de modalité expliquée par le *medium littéraire*.

Avant de commencer notre analyse, nous présentons le tableau en page suivante (Tab. 1) qui explique la répartition des degrés dans une octave suivant le système de Mashāqa. Il permettra de mieux comprendre le mode *Dūkā* et de mieux situer l'énoncé musical de l'auteur.

### Analyse du tableau

Nous avons construit, en nous inspirant d'un tableau de Mashāqa<sup>23</sup> et en suivant les degrés qu'il cite, une octave débutant sur le degré *dūkā* (*ré* en bas/grave) et finissant sur le degré *muḥayyar* (*ré* en haut/aigu). Cette octave est celle du (mode) *Dūkā*, qui débute traditionnellement sur le (degré) *dūkā*. Remarquons qu'il existe certaines notes altérées par un demi-bémol ou un demi-dièse<sup>24</sup>.

Le tableau comporte des degrés principaux, les *abrāj*<sup>25</sup> qui sont mis en relief sur un fond gris, et des degrés secondaires, les *nīm* (qui abaissent le degré d'un quart de ton approximatif) et les *tīk* (qui haussent le degré d'un quart de ton approximatif) et des degrés qui se trouvent à mi-chemin entre ceux qui ne sont pas altérés ; ces derniers sont les *anṣāf*<sup>26</sup> – ou « moitiés » d'intervalles comme le *shahnāz* (vers le haut du tableau) ou le *hijāz* (vers le centre du tableau).

Nous avons représenté, sur une portée occidentale, chacun des degrés de cette octave. Les notes se lisent en ajoutant une clé de sol sur la 2<sup>e</sup> ligne de la portée. Les *nīm* sont indiqués par un « - moins » et les *tīk*, par contre, le sont par un « + plus ».

Nous avons ajouté les noms des degrés en français translittéré. Remarquons d'emblée que les degrés principaux et les *anṣāf* ont une identité et une existence qui leurs sont propres<sup>27</sup>. Les nombres figurant à droite correspondent au nombre de « quarts de ton » entre chaque *burj*, par exemple, entre *dūkā* et *sikā* il y a « 3 » ce qui veut dire trois quarts de ton.

### À TRAVERS LES TEXTES – LA PROBLÉMATIQUE DU PREMIER LAḤN DE MASHĀQA

Nous présenterons cinq textes interprétatifs à titre de comparaison pour le mode *Dūkā*. Trois versions en arabe (en plus de leur translittération), celle de Ronzevalle comparée à une édition plus tardive du même auteur et celle de Faṭḥ-al-Lāh ; une édition en français, celle de Ronzevalle, et une édition en anglais, celle de Smith.

Nous n'analyserons pas la version anglaise du fait que son auteur déclare que :

« [...] In translating, I have abridged [Mashāqa's] work a good deal, have not always observed his order in the arrangement of the sections, and have frequently taken the liberty to express his thoughts in my own style »<sup>28</sup>.

Dans un deuxième temps, nous comparons ces versions avec les manuscrits disponibles.

### Observations premières

Nous commentons ici les comparaisons contenues dans le Tableau n°2 intitulé *Le premier Laḥn* ; les termes encadrés sont les noms des degrés *rāst* et *dūkā* ainsi que les lettres représentant ces degrés dans la version française de Ronzevalle<sup>29</sup>. Au premier abord, nous remarquons la différence du nombre des degrés du premier *laḥn*.

Le problème commence par la ponctuation, en l'occurrence les virgules qui se trouvent dans la version de Faṭḥ-al-Lāh et qui pourraient changer le nombre de degrés. Ainsi, une traduction libre de sa version donnerait, à partir du premier encadrement et en tenant compte de la ponctuation qu'elle place :

« [...] *dūkā, rāst, dūkā, rāst, dūkā, rāst* trois fois, puis *nawā, jhārkā, sikā, dūkā, rāst, dūkā, [...]* ».

Une reproduction sur portée donnerait pour Faṭḥ-al-Lāh, en respectant le texte et la ponctuation et les mises en relief qu'elle propose, la version suivante (Not. 1) :



Notation 1. Première partie du premier *laḥn* selon les indications de Faṭḥ-al-Lāh : « [...] *dūkā, rāst, dūkā, rāst, dūkā, rāst* trois fois, puis *nawā, jhārkā, sikā, dūkā, rāst, dūkā, [...]* ».

<b>محرير</b>		<b>muḥayyar</b>	
تیک شهنآظ		tik shahnāz	<b>4</b>
شهنآظ		shahnāz	
نیم شهنآظ		nīm shahnāz	
<b>ماهور</b>		<b>māhūr</b>	
تیک نهفت		tik nahuft	<b>3</b>
نهفت		nahuft	
<b>اوج</b>		<b>awj</b>	
عجم		'ajam	<b>3</b>
نیم عجم		nīm 'ajam	
<b>حسینی</b>		<b>ḥusaynī</b>	
تیک حصار		tik ḥiṣār	<b>4</b>
حصار		ḥiṣār	
نیم حصار		nīm ḥiṣār	
<b>نوا</b>		<b>nawā</b>	
تیک حجاز		tik ḥijāz	<b>4</b>
حجاز		ḥijāz	
نیم حجاز		nīm ḥijāz	
<b>چهارگاه</b>		<b>jhārkā</b>	
تیک بوسلیک		tik būsālīk	<b>3</b>
بوسلیک		būsālīk	
<b>سیکاه</b>		<b>sīkā</b>	
کردی		kurdī	<b>3</b>
نیم کردی		nīm kurdī	
<b>دوگاه</b>		<b>dūkā</b>	

Répartition des degrés dans l'octave de *dūkā* à *muḥayyar*

Tableau 1. Répartition des degrés dans une octave : inspiré d'un tableau de Mashāqa.

<b>Le premier laḥn<sup>30</sup></b>	
<b>Version de Ronzevalle<sup>31</sup> (1899) basée sur le Ms. BO 220 et le manuscrit de El-Khoury (C)</b>	<b>Version de Faḥ-al-Lāh<sup>32</sup> (1996) basée « sur cinq Ms. » dont l'édition de Ronzevalle (1899)<sup>33</sup></b>
<p>[...] في الألهان التي يكون قرارها من<sup>34</sup> برج الدوكاه</p> <p>هي واحد وأربعون لحنًا الأول "الدوكاه المسمى عشاق الأتراك" وهو من<sup>35</sup></p> <p>دوكاه رست دوكاه رست ثلاث مرات دوكاه رست دوكاه رست ثم نوى جهارگاه سيكاه دوكاه دوكاه</p> <p>دوكاه رست دوكاه رست ثم تصعد إلى برج الحسيني برجا برجا مظهرًا برج الحسيني ثم عجم ثم نوى وجهارگاه مظهرًا ثم سيكاه دوكاه.</p> <p>وهذا اللحن يلحقه أكثر علماء البلاد الشامية بلحن البياتي بواسطة قراره على برج الدوكاه ولكنه يستعمل فيه ربع العجم بدلاً من برج الأوج وسيظهر لك فرقه عند تعريف البياتي وأنواعه</p>	<p>[...] في الألهان التي يكون قرارها على برج الدوكاه</p> <p>وهي واحد وأربعون لحنًا الأول (الدوكاه)، المسمى (عشاق الأتراك note 1 par l'auteur) وهو دوكاه رست دوكاه رست دوكاه رست ثلاث مرات، ثم نوى، جهارگاه، سيكاه، دوكاه (note 2 par l'auteur)، رست، دوكاه note 3 par l'auteur، ثم تصعد إلى برج الحسيني برجا برجا مظهرًا لبرج الحسيني، ثم عجم، ثم نوا وجهارگاه/ مظهرًا، ثم سيكاه، دوكاه.</p> <p>وهذا اللحن يلحقه أكثر علماء البلاد الشامية بلحن البياتي بواسطة قراره على برج/ الدوكاه، ولكنه يستعمل فيه ربع العجم بدلاً من برج الأوج، وسيظهر لك فرقه عند تعريف البياتي وأنواعه<sup>36</sup></p>
<b>Version de Ronzevalle translittérée</b>	<b>Version de Faḥ-al-Lāh translittérée</b>
<p>[...] fi l alhān l latī yakūn qarāruhā min burj al dūkā.</p> <p>Hiya wāḥid wa arbaʿūn laḥnan al awwal "al dūkā l musammā 'ushshāq l atrāk" wa huwa min dūkā rast dūkā rast thalāth mirār thumma nawā jhārkā sikā dūkā dūkā dūkā rast dūkā thumma taṣʿad ilā burj l ḥusaynī burjan burjan muzhīran burj l ḥusaynī thumma 'ajam thumma nawā wa jhārkā muzhīran thumma sikā dūkā.</p> <p>Wa hādha l laḥn yulḥiquhu akthar 'ulamā' l bilād sh shāmiyya bilāḥn l Bayyāti biwāsīṭat qarārihi 'ala burj l dūkā wa likawnihī yustaʿmal fihī rub' l'ajam badalan min burj l awj wa sayazhar laka farquhu 'inda taʿrif l Bayyāti wa anwāʿih</p>	<p>[...] fi l alhān l latī yakūn qarāruhā 'alā burj al dūkā.</p> <p>Wa hiya wāḥid wa arbaʿūn laḥnan al awwal (al dūkā) l musammā ('ushshāq l atrāk) wa huwa dūkā, rast, dūkā, rast, dūkā, rast thalāth marrāt. thumma nawā, jhārkā, sikā, dūkā, dūkā, rast, dūkā thumma taṣʿad ilā burj l ḥusaynī burjan burjan muzhīran burj l ḥusaynī, thumma 'ajam, thumma nawā wa jhārkā muzhīran, thumma sikā dūkā.</p> <p>Wa hādha l laḥn yulḥiquhu akthar 'ulamā' l bilād sh shāmiyya bilāḥn l Bayyāti biwāsīṭat qarārihi 'ala burj l dūkā wa likawnihī yustaʿmal fihī rub' l'ajam badalan an burj l awj wa sayazhar laka farquhu 'inda taʿrif l Bayyāti wa anwāʿih</p>
<b>Version anglaise de Smith (1849)<sup>37</sup></b>	
<p><i>Dîgâh</i>, called <i>Ashshâq of the Turks</i>. It is 5, 4, 5, 4, 5, 4, 8, 7, 6, 5, 4, 5, then ascends note by note distinctly to 9, then 9b, 8, 7 distinctly, 6, 5. Most of the Syrians consider it a variety of the tune <i>beyâtî</i>, by reason of its being keyed on 5, and the use in it of 9b for 10. The difference will be pointed out in treating of <i>beyâtî</i> and its varieties</p>	
<b>Version française de Ronzevalle (1913)<sup>38</sup></b>	
<p>Le 1<sup>er</sup> est D, appelé « <i>Uššāq ul-atrāk</i> [les Amants chez les Turcs] » Le voici : <math>\underline{D}</math>, <math>\underline{R}</math>; <math>\underline{D}</math>, <math>\underline{R}</math>; trois fois; puis N, <math>\underline{G}</math>, S, <math>\underline{D}</math>, <math>\underline{D}</math>, <math>\underline{D}</math>, <math>\underline{R}</math>, <math>\underline{D}</math>. On monte ensuite, degré par degré, jusqu'à H que l'on soutient; puis 'ajam, N, <math>\underline{G}</math> app., puis S, D. La plupart des musiciens syriens font succéder<sup>39</sup> cet air à celui de « <i>Bayātî</i> », au moyen de sa tonique D, et aussi, parce qu'on y fait entendre le quart 'ajam au lieu du degré A. On en verra cependant la différence quand il sera question du « <i>Bayātî</i> » et de ses espèces</p>	

Tableau 2. Comparaison des différentes versions du premier laḥn.

On ne retrouve cependant pas cet agencement des notes dans sa transposition sur la portée<sup>40</sup> malgré son assurance au lecteur qu'elle traduit littéralement ce que Mashāqa propose comme énoncé<sup>41</sup>.



Notation 2. Reproduction de la portée de Faṭḥ-al-Lāh dans [Mashāqa, 1996, p. 64, note n°4] ; première partie de la notation qu'elle propose pour traduire les indications de Mashāqa.

Il manque clairement « [...] *rāst* trois fois [...] », nonobstant le soin pris par Faṭḥ-al-Lāh de bien le mettre en exergue par le biais des virgules dans sa version littérale<sup>42</sup>. Cependant elle passe tout de suite du *rāst* au *nawā* (entourés par un cercle pointillé) et continue l'écriture<sup>43</sup> sur une portée. Remarquons aussi qu'elle ne donne aucune valeur rythmique aux notes. À ce stade, la ponctuation ne nous semble présenter, dans son édition, aucun intérêt.

Les raisons pour lesquelles Faṭḥ-al-Lāh aurait choisi de ponctuer son texte nous sont pour le moment obscures. Par ailleurs nous présumons que les manuscrits dont elle se servait pour son édition ne répétaient pas ce même détail puisque l'exemple du manuscrit de la version de Ronzevalle<sup>44</sup> montre une différence du même contenu, cité parmi ses sources<sup>45</sup> mais non ponctué.

Poursuivons par la traduction de Ronzevalle. Du premier encadrement jusqu'au dernier, et en guise de comparaison avec la version de Faṭḥ-al-Lāh qui donnerait : « [...] *dūkā rāst dūkā rāst* trois fois puis *nawā jhārkā sikā dūkā dūkā dūkā rāst dūkā* [...] ».

Ce texte, transposé sur une portée, offre plusieurs possibilités. Dans la première, nous avons considéré que Mashāqa aurait voulu que l'expression entière avant le « trois fois » se répète trois fois, parce que dans le cas contraire il aurait écrit « *rāst rāst rāst* » comme il l'a fait pour le *dūkā* vers la fin de cette première partie :



Notation 3. Première version de la première partie du premier *lahn* selon les indications de Ronzevalle : « [...] *dūkā rāst dūkā rāst* trois fois puis *nawā jhārkā sikā dūkā dūkā dūkā rāst dūkā* [...] ».

Il est possible de saisir autrement la répétition, ainsi que Faṭḥ-al-Lāh avait choisi de le faire, et de considérer qu'elle s'était rapportée uniquement à la dernière note indiquée, le *rāst*, ce qui résulterait en une deuxième version (voir la portée suivante – Not. 4).



Notation 4. Deuxième version de la première partie du premier *lahn* selon les indications de Ronzevalle : « [...] *dūkā rāst dūkā rāst* trois fois puis *nawā jhārkā sikā dūkā dūkā dūkā rāst dūkā* [...] ».

Il reste une version qui aurait consisté à répéter uniquement les deux notes citées avant le « trois fois », la notation dans ce cas aurait été :



Notation 5. Troisième version de la première partie du premier *lahn* selon les indications de Ronzevalle : « [...] *dūkā rāst dūkā rāst* trois fois puis *nawā jhārkā sikā dūkā dūkā dūkā rāst dūkā* [...] ».

Enfin une dernière version qui aurait répété les trois dernières notes qui se seraient trouvées avant le « trois fois » :



Notation 6. Quatrième version de la première partie du premier *lahn* selon les indications de Ronzevalle : « [...] *dūkā rāst dūkā rāst* trois fois puis *nawā jhārkā sikā dūkā dūkā dūkā rāst dūkā* [...] ».

Ceci prouve qu'il n'est pas facile de comprendre ce que Mashāqa avait voulu dire dans sa relation littéraire de la succession des degrés du mode, et qu'il serait presque impossible, en conséquence, d'en établir une recension.

Nous en avons une démonstration supplémentaire à travers l'exemple suivant, qui est la version<sup>46</sup> que propose Abou Mrad<sup>47</sup> pour ce premier *lahn* :

« *dūkā, rāst, dūkā, rāst*, trois fois, puis *nawā, jahārkā, sikā* mis en valeur, puis *ḥusaynī, nawā* mis en exergue, suivi de *jahārkā, sikā, dūkā, dūkā, dūkā, rāst, dūkā*, puis montée graduelle jusqu'au degré *ḥusaynī* qui est mis en exergue, suivi de '*ajam, nawā, jahārkā* qui est mis en exergue, puis *sikā* et *dūkā* »<sup>48</sup>.

L'auteur transcrit ensuite cette description en trois mesures binaires dans la forme suivante<sup>49</sup> :



Notation 7. Reproduction du premier *lahn* selon Abou Mrad, supposée traduire le texte : « *dūkā, rāst, dūkā, rāst*, trois fois, puis *nawā, jahārkā, sikā* mis en valeur, puis *ḥusaynī, nawā* mis en exergue, suivi de *jahārkā, sikā, dūkā, dūkā, dūkā, rāst, dūkā*, puis montée graduelle jusqu'au degré *ḥusaynī* qui est mis en exergue, suivi de '*ajam, nawā, jahārkā* qui est mis en exergue, puis *sikā* et *dūkā* ».

Remarquons comment Abou Mrad a interprété le « trois fois », en considérant (probablement) que Mashāqa, au lieu d'ajouter encore une fois « *dūkā, rāst* » aurait décidé d'écrire « trois fois » pour indiquer qu'il aurait voulu ce résultat : « *dūkā, rāst, dūkā, rāst, dūkā,*

*rāst* [...]», et c'est de cette façon qu'Abou Mrad commence, sur une portée, sa notation du *lahn*.

Ce dernier auteur se base uniquement sur l'édition de Fath-al-Lāh et les deux éditions de Ronzevalle. Il propose ensuite des « échelles de recension pondérée » de certaines mélodies de Mashāqa, et justifie sa démarche en notant que « [ces échelles] sont élaborées, ci-après, en tenant compte à la fois des occurrences et des durées relatives telles qu'elles apparaissent dans le texte »<sup>50</sup>. Il ne précise cependant pas de quel texte il est question. Nous avons déjà montré que, entre deux versions du traité de Mashāqa en arabe, les interprétations peuvent varier, et qu'il existe au moins deux manuscrits qui ne rapportent pas exactement les mêmes propos.

Il en résulte qu'il n'est pas aisé d'attribuer de valeurs fixes aux occurrences des durées relatives telles qu'elles apparaissent dans le texte, et que celles « restituées » par Abou Mrad restent hypothétiques. De plus, cet auteur considère que les termes *مظهرًا muzhiran*<sup>51</sup>, *تلميحا talmiḥan*<sup>52</sup> et quelques autres employés par Mashāqa introduisent une fonction rythmique du degré qu'ils qualifient<sup>53</sup>. Nous pensons, de notre côté, que ces termes pourraient aussi bien indiquer une accentuation qui varierait entre *douce*, *faible* et *forte*, par exemple, ou une nuance dans le jeu ou le chant ou une autre façon d'interpréter qu'on ne connaît pas et qui aurait décliné avec le temps.

Remarquons par ailleurs que Ronzevalle traduit le terme *مظهرًا muzhiran* par l'expression « que l'on soutient »<sup>54</sup>, alors que Abou Mrad traduit par « mis en exergue ». Ces détails montrent encore une fois la difficulté de dégager une vérité quelconque de ces descriptions et la vraie « mission impossible » qu'est la transcription sur une portée<sup>55</sup> de l'énoncé de Mashāqa : d'un côté, il n'existe malheureusement pas de preuves qui confirmeraient que ces termes soient des indicateurs rythmiques, et de l'autre, il n'existe pas non plus, à notre connaissance, de sources qui indiqueraient que ce soient des consignes de nuance, tout comme il n'y a pas dans l'épître d'indications plus précises de Mashāqa quant à la signification exacte de ces termes.

Nous arrivons maintenant à la question suivante : pourquoi Mashāqa aurait-il écrit les degrés et donné des consignes tout en s'abstenant de transcrire lui-même ses mélodies par une méthode autre que littéraire ? Est-il possible qu'il ait préparé, en parallèle, un autre traité, peut-être perdu, plus axé sur la pratique de cette musique ? Ou bien est-ce que sa démarche aurait eu pour but d'affirmer l'oralité de la musique arabe ? Si c'est le cas, pourquoi donc certains musicologues<sup>56</sup> arabes qui ont travaillé sur son traité se sont efforcés de limiter les mélodies sur une portée, recenser les degrés et, pour l'un d'entre eux, faire des statistiques ?

Nous entreprenons, en section suivante, l'étude des manuscrits originaux afin d'essayer d'en extraire une réponse, même partielle, à ces questions.

## LA VERSION DE RONZEVALLE – 1899

Poursuivons maintenant notre quête avec les quelques manuscrits disponibles pour essayer de comprendre comment Ronzevalle a procédé afin d'établir ses éditions de 1899, surtout en ce qui concerne le premier *lahn*.

Les versions manuscrites dont Ronzevalle s'est servi pour l'édition de ce traité sont partiellement disponibles<sup>57</sup>. Le catalogue<sup>58</sup> des manuscrits de la Bibliothèque Orientale rapporte que Ronzevalle s'est basé sur le Ms. BO 220 pour son édition de 1899 ; et ensuite sur un autre manuscrit, le Ms. BO 221, pour sa deuxième édition et sa traduction de 1913.

Dans son avant-propos<sup>59</sup>, l'éditeur explique qu'il se base sur deux manuscrits sans toutefois citer leurs numéros, mais il dit que l'un des deux est conservé à la BO.

Ce catalogue précise<sup>60</sup> que le Ms. BO 221 a été acheté en 1912. C'est donc bien plus tard que l'édition de 1899. Cela nous assure que la comparaison suivante a lieu entre le Ms. BO 220 et le texte de Ronzevalle. L'autre manuscrit appartenait à Louis El-Khoury<sup>61</sup> qui avait donné à Ronzevalle l'autorisation de s'y référer pour établir son édition critique en arabe : ce manuscrit est probablement celui que nous avons récemment retrouvé au Couvent Saint-Sauveur à Joun.

Procédons pour le moment avec un seul manuscrit, pour la vérification de la ponctuation du texte (Fig. 1) : nous remarquons qu'il n'existe aucune ponctuation dans cet extrait<sup>62</sup>. La comparaison de la première partie du premier *lahn* entre notre manuscrit et l'édition de 1899 montre un manque au niveau du degré « *dūkā* ». Les deux hexagones entourent deux « *dūkā* », que l'on retrouve au nombre de trois dans l'édition de 1899.

Ronzevalle inscrit trois « *dūkā* » au lieu de deux : peut-être s'est-il basé sur l'autre manuscrit qui en rapporterait trois. Bien que la différence d'un degré soit évidente entre sa version et celle du manuscrit, l'éditeur n'explique pas comment il a choisi son texte final. Par ailleurs, la version française de Ronzevalle<sup>63</sup> rapporte le premier *lahn* de la façon suivante :

« Le 1<sup>er</sup> est *D*, appelé «*Uṣṣāq ul-atrāk* [les Amants chez les Turcs]»  
Le voici :  $\underline{D}, \underline{R}; \underline{D}, \underline{R}$ ; trois fois ; puis *N, G, S, D, D, D, R, D*. On monte ensuite, degré par degré, jusqu'à *H* que l'on soutient ; puis '*aḡam, N, G* app., puis *S, D*. La plupart des musiciens syriens font succéder cet air à celui de «*Bayāti*», au moyen de sa tonique *D*, et aussi, parce qu'on y fait entendre le quart '*aḡam* au lieu du degré *A*. On en verra cependant la différence quand il sera question du «*Bayāti*» et de ses espèces ».

Les trois *dūkā* qui se suivent sont clairement cités dans cette version. L'explication de ce choix vient tardivement<sup>64</sup> dans l'édition française où l'auteur raconte qu'il a eu le temps de mieux étudier les manuscrits sur lesquels il s'était basé pour son édition précédente (de 1899). Il confirme par la suite qu'il a publié l'édition de

1899 à partir du manuscrit de 1887 qu'il symbolise par (A) et le manuscrit de Louis El-Khoury qu'il symbolise par (C). Il trouve que le second manuscrit (B), récemment acquis par la bibliothèque, ressemble au manuscrit qui se trouve à Damas et qu'il symbolise par (D).

Ensuite, Ronzevalle écrivait que les manuscrits (A), (B) et (C) s'accordent sur des points minimes contre (D), ce qui prouverait selon lui que Mashāqa aurait retouché son propre manuscrit après que les premières copies aient été faites.



Fig. 1. Extrait n°1 du Ms. BO 220 et exposant le premier *lahn* selon Mashāqa.<sup>65</sup>

Il déclare, à la fin, qu'il a préféré suivre (D) pour l'édition arabe qui se trouve à la suite de la française, dans le même volume. Puis il propose une liste de corrections<sup>66</sup>.

Nous nous intéressons en particulier aux lignes suivantes, qui concernent la correction de la fin de ce premier *lahn*. Dans l'extrait n°1 (Fig. 2) Ronzevalle donne la correction concernant le premier *lahn*, cette correction touche seulement la fin et n'affecte pas la première moitié de ce *lahn*. La fin, par contre, augmente de deux degrés, « R » *rāst* et « D » *dūkā*.

p. 40, l. 4, vers la fin : corriger ainsi : « N, Ġ, S, D, R, D ». Le Ms D porte « N, Ġ, S, D, R, R, D ».

Fig. 2. Extrait n°1 de l'édition 1913 de Ronzevalle, p. 118, reproduisant les lignes qui indiquent les corrections à apporter à la description du premier *lahn* selon Mashāqa.

Regardons maintenant la ligne 4, dans l'extrait n°2 (Fig. 3) qui suit, et poursuivons notre examen de ce

premier *lahn* et notons les différences avec le Ms. BO 221 (Fig. 4).

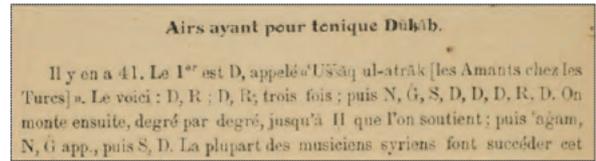


Fig. 3. Extrait n°2 de l'édition 1913 de Ronzevalle, p. 40, les premières lignes correspondant au début de la description du premier *lahn* selon Mashāqa.<sup>67</sup>

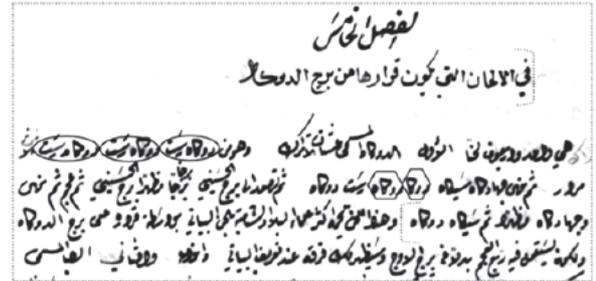


Fig. 4. Extrait n°1 du Ms. BO 221 exposant le premier *lahn* selon Mashāqa. Les trois ovales entourent chacun « *dūkā rāst* » et les deux hexagones chacun un « *dūkā* ».

Translittération de l'extrait entre parenthèses  
du Ms. BO 221

[...] fi l alhān l latī yakūn qarāruhā min burj l dūkā.

Hiya wāhid wa arba'un lahnān al awwal al dūkā l musammā 'ushshāq l atrāk wa huwa min dūkā rāst dūkā rāst dūkā rāst thalāth mirāi; thumma nawā jhārkā sikā dūkā dūkā rāst dūkā thumma taṣ'ad ilā burj l husaynī burjan burjan muzhiran burj l husaynī thumma 'ajam thumma nawā wa jhārkā muzhiran thumma sikā dūkā [...]

La différence avec le Ms. 220, juste pour ces premières lignes, est remarquable. Le Ms. 221 présente deux degrés de plus que le Ms. 220. Ces degrés sont entourés d'un ovale : *dūkā* et *rāst*.

Observons maintenant le manuscrit (Fig. 5) récemment retrouvé à Joun<sup>68</sup> qui est, à notre avis, le manuscrit (C) dont parle Ronzevalle. Nous avons en principe ainsi les trois manuscrits sur lesquels il se serait basé pour établir sa version française<sup>69</sup>. Nous soulignons ici la ressemblance de la première partie du premier *lahn* de l'extrait de la Figure 5 avec celui du Ms. BO 220.

Comme conclusion de ce point, nous reproduisons à titre de comparaison les deux reproductions numériques des versions complètes de ce *lahn* selon Abou Mrad et Fath-al-Lāh (Fig. 6).

Enfin, nous proposons un simple exposé du contenu de l'échelle relative à ce *lahn* constituée du degré le plus bas jusqu'au degré le plus haut avec leurs noms respectifs

en arabe<sup>70</sup> et leur place correspondante sur une portée (Fig. 7). Nous nous éloignons ainsi de la recension qui, comme nous l'avons écrit plus haut, est futile vu les problèmes d'interprétation et les possibilités multiples de compréhension des indications de Mashāqa.

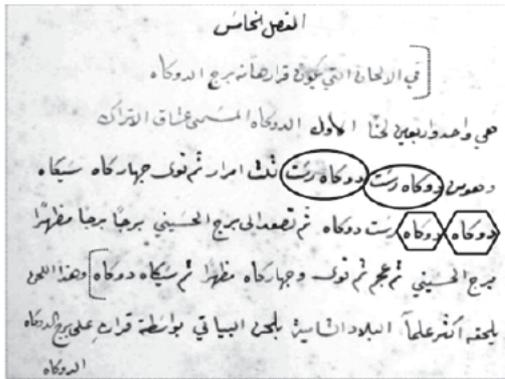


Fig. 5. Extrait du Ms. OBS\_1741, exposant le premier *lahn* selon Mashāqa<sup>71</sup>.

Translittération de l'extrait entre parenthèses  
du Ms. OBS 1741

[...] fi l alhān l latī yakūn qarāruhā min burj l dūkā.

Hīya wāhid wa arba'in lahnān al awwal al dūkā l musammā 'ushshāq l atrāk wa huwa min dūkā rast dūkā rast thalāth amrāi thumma nawā jhārka sīkā dūkā dūkā rast dūkā thumma taṣ'ad ilā burj l ḥusaynī burjan burjan muzhīran burj l ḥusaynī thumma 'ajam thumma nawā wa jhārka muzhīran thumma sīkā dūkā [...]

EN CONCLUSION

Faut-il revoir toute une manière de faire et appliquer une autre méthodologie pour l'analyse des manuscrits énonçant, de façon ambiguë ou non, des échelles et des mélodies ?

Il semblerait, sur l'exemple que nous produisons de cette épître de Mikhā'il Mashāqa, que chercher une exactitude des significations et de leur interprétation de la

part du musicologue dans le but d'en extraire des portées et des statistiques est une mission qui ne peut pas aboutir, en l'état de nos connaissances, à des résultats cohérents.

C'est du moins ce que montre ce paragraphe de l'épître que nous venons d'exposer dans toutes ses interprétations connues<sup>72</sup> jusqu'à présent. Pour éviter ce genre de problèmes, nous souhaiterions pouvoir un jour formuler une méthodologie qui permettrait à tout chercheur de retenir l'essence théorique des manuscrits spécialisés sans se perdre dans des interprétations spécieuses.

Peut-être faudrait-il ne pas recenser ni compter. Peut-être faudrait-il s'éloigner des calculs et chercher la sensibilité dans cette musique qui, avant même de retrouver son éclat du passé, commence déjà à se perdre dans l'*a priori* analytique.

Nous devons cependant plus particulièrement, en ce qui concerne cette épître, garder à l'esprit que Mashāqa, homme intelligent aux talents multiples, avait, sans aucun doute, un but à travers ces énoncés musicaux, et qu'il n'est pas impossible qu'il n'ait pas voulu noter ces mélodies, bien qu'il aurait pu le faire<sup>73</sup>. Ce sont les raisons de ce choix qui sont importantes dans notre démarche. On pourrait argumenter que c'était par paresse et qu'il cherchait le moyen le plus simple de faire les choses ; cependant, et vu l'ampleur et la cohérence de son épître, cette option paraît devoir être écartée.

Notons par ailleurs que l'épître était destinée dès le début<sup>74</sup> à un émīr de la famille Shihāb dont on ne sait que peu de choses jusqu'à la rédaction de cet article. C'est là que nous pouvons supposer que Mashāqa aurait voulu que le destinataire<sup>75</sup> de son épître comprenne son propos, et que c'est pour cette raison qu'il aurait énoncé ses *alhān* de manière littéraire, lui permettant ainsi de les exposer à l'émīr, et à ses autres lecteurs potentiels, d'une manière intelligible.

Il est facile d'imaginer à partir de là un scénario selon lequel Mashāqa aurait voulu présenter *personnellement* son traité à l'émīr<sup>76</sup>, lui expliquant le contenu et le guidant dans la compréhension et la lecture : ce serait ainsi dans ces paroles perdues dans le temps que se seraient trouvés les vrais sens de ses descriptions et la compréhension de la modalité que cet auteur aurait essayé de transmettre.

Abou Mrad <sup>77</sup>	
Fath-al-Lāh <sup>78</sup>	

Fig. 6. Reproduction totale de la notation du premier *lahn* selon Abou Mrad et Fath-al-Lāh.



Noms arabes	راست	دوكاه ♦	سيكاه	جهاركاه	نوا	حسيني	عجم
Noms translittérés	rāst	dūkā ♦	sikā	jhārkā	nawā	ḥusaynī	‘ajam

Fig. 7. Échelle représentative du premier *lahn* chez Mashāqa<sup>79</sup>.

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## Notes

<sup>1</sup> Cachée, comme nous le déduisons en lisant entre les lignes du traité musical d'Ibn aṭ-Ṭaḥḥān (musicien et théoricien du XI<sup>e</sup> siècle – voir [Ṭaḥḥān (ibn a-t-~ al-Mūsīqī), 1976; 1990]).

<sup>2</sup> La musique de variété et la musique populaire d'aujourd'hui dans les pays arabes se basent, pour la grande majorité, sur le système tonal occidental et sur l'harmonie.

<sup>3</sup> Par exemple, (al-) Fārābī (théoricien et philosophe du IX<sup>e</sup>-X<sup>e</sup> siècles) – voir [Beyhom, 2010, v. 1, Chapitre II].

<sup>4</sup> Par exemple, (al-) Kindī (surnommé « Le Philosophe des Arabes », théoricien du IX<sup>e</sup> siècle) – voir [Beyhom, 2010, v. 1, p. 168–179] et [Wright, 2006].

<sup>5</sup> [Kindī (al-), 1965, p. 27–31].

<sup>6</sup> Forme vocale de l'époque abbasside. (Al-) Urmawī (musicien et théoricien du XIV<sup>e</sup> siècle) propose (voir [Urmawī (al-), 1984, p. 93–94])

une notation et des paroles suivant un code alphabétique de transcription. Une reproduction musicale de ce *sawt* a été faite par Abou Mrad en 2004 ([Abou Mrad, 2004]).

<sup>7</sup> Trois copies de manuscrits sont en notre possession, deux de la Bibliothèque Orientale de Beyrouth ([Mashāqa, 1887] et [Mashāqa, s.d. (XIX<sup>e</sup> siècle)]) et un manuscrit [Mashāqa, s.d. (XIX<sup>e</sup> siècle)] du Couvent des Moines Basiliens Salvatoriens à Joun, ainsi que les éditions de Smith (en anglais [Mashāqa, 1849]), Ronzevalle (en arabe, dans la revue Al-Mashriq en plusieurs parties [Mashāqa, 1899a], et sous forme de tiré à part [Mashāqa, 1899b] et bilingue français-arabe [Mashāqa, 1913]), Fath-al-Lāh (en arabe, [Mashāqa, 1996]), et finalement l'article d'Abou Mrad [2007] (en français). Il faut noter ici que (selon le musicologue Amine Beyhom en discussion privée) au moins trois auteurs importants (l'Anonyme auteur de *A-sh-Shajara dhāt al-Akmām* [Anonyme, 1983], le traité de (al-) Ṣafādī [[Ṣafādī (a-ṣ-)], 1991] ainsi que celui de (al-) Dimashqī [Ṣaydāwī (a-ṣ-); Ṣaydāwī (a-ṣ-)

and Thérèse B. Antar, 1979; Şaydāwī (a-ṣ-) and Thérèse (soeur) Antar, 2001]), intermédiaires entre Urmawī et Mashāqa, utilisent des descriptions formulaires des modes: il aurait cependant été trop complexe de traiter de ces écrits dans cet article, la comparaison de la description d'un seul mode selon diverses interprétations d'un même écrit (ici celui de Mashāqa) demandant déjà plusieurs pages.

<sup>8</sup> Qui est, selon Fruma Zachs [2005]: «Born in 1215/1800 in the village of Rashmayyā, 12 km southeast of Beirut, M.M. grew up in Deir al-Qamar, on Mount Lebanon. He was a descendant of Yūsuf Batrākī, a Greek Orthodox merchant from the island of Corfu who moved to Tripoli to take up the silk trade. There, in an allusion to his new profession, Yūsuf adopted the name “Mishāqa,” (a term used in reference to the process of filtering silk fibers). M.M.’s great-grandfather was a convert to Catholicism [...] In Damascus [...] He studied astronomy, mathematics, geography and music with the renowned Muslim scholar Allama Muhammad Attar. He also undertook the study of medicine, for which he was awarded a diploma in Egypt in 1261 [de l’Hégire]/1845”.

<sup>9</sup> Première moitié du XIX<sup>e</sup> siècle.

<sup>10</sup> Nous écrivons ceci à la lumière de ce que les musicologues comme Farmer, Erlanger et d’autres ont avant nous, écrit sur Mashāqa. Nous notons la raison directe et simple qui l’a élevé à leurs yeux à cette position de pionnier des théories modernes: il nous est parvenu de lui en premier une description écrite de la division en vingt-quatre quarts de ton égaux. Il est fort possible que d’autres auteurs arabes aient décrit cette division avant lui mais leurs manuscrits ne sont pas parvenus jusqu’au temps présent.

<sup>11</sup> [Abou Mirad, 2007, p. 118].

<sup>12</sup> Par exemple [Beyhom, 2005, p. 66]: «Si l’utilisation du cadre des 24 quarts de ton à l’octave permet une description qualitative (et satisfaisante dans la pratique) des intervalles utilisés en musiques arabes, elle ne suffit néanmoins pas à décrire le système modal préconisé par les théoriciens et praticiens de cette musique»; signalons également que, au cours d’une communication personnelle [12-1-2010], ce musicologue nous avait dit que l’idée du «quart de ton» existait dans la région avant que Mashāqa ne l’introduise, cependant son origine et le contexte de sa genèse ne sont pas trouvés jusqu’à présent. Isis Fatḥ-al-Lāh explique (dans [Mashāqa, 1996]) cette erreur à la page h (ح), précédée par Ronzevalle qui la relevait en 1899 dans son introduction à l’édition arabe (dans [Mashāqa, 1899b]).

<sup>13</sup> [Farmer, 1934, p. 653] fait déjà part de ce fait en présentant l’école moderne.

<sup>14</sup> Voir le début du traité édité par Ronzevalle, [Mashāqa, 1913, p. 14].

<sup>15</sup> [Farmer, 1934, p. 654].

<sup>16</sup> Dans le quatrième chapitre (Livre I) du Tome 5, [Erlanger, 1949, v. 5, p. 32].

<sup>17</sup> Intitulé retrouvé chez [Erlanger, 1949, v. 5, p. 32]. L’intitulé en arabe est écrit sur tous les manuscrits, selon Fatḥ-al-Lāh dans [Mashāqa, 1996, p. ٢١ (ط)]. Un autre intitulé est proposé, dans la traduction intégrale du manuscrit selon Ronzevalle [Mashāqa, 1913, p. 10]: «Lettre sur l’art musical par le Dr. Michel Mušāqa dédiée à l’Émir Chéhab».

<sup>18</sup> Une copie de ce manuscrit nous a aimablement été fournie par le Couvent Saint-Sauveur des Moines Basiliens Salvatoriens, Joun – Saida, Liban-Sud, dans la bibliothèque duquel se trouve l’original, probablement autographe comme nous le verrons plus loin dans le texte.

<sup>19</sup> [Beyhom, 2007, p. 15]. Le problème des aspects théoriques de la musique arabe est détaillé dans le dernier paragraphe et il nous semble correspondre aux problèmes que nous indiquerons au fur et à mesure du présent article.

<sup>20</sup> Ce mode est apparenté au mode très connu *Bayyātī*, comme l’explique Mashāqa et d’autres auteurs dans la suite de l’article.

<sup>21</sup> *Alḥān*, pluriel de *lahn*, terme arabe qui a plusieurs significations selon le dictionnaire encyclopédique de Ibn Manẓūr, le *Lisān al-‘Arab*. En ce qui concerne la musique ce terme regroupe, dans ses déclinaisons, les belles mélodies d’un chant, le chant (*al-ghinā’*) de manière générale ainsi que la bonne prononciation (*al-qirā’*) et le manche du *ūd* – l’endroit d’où sont produites les mélodies – «ملاجن العود: حُرُوبٌ تَمَنَاتُهُ». Ces connotations sont en partie reliées à l’islam et au Coran, comme le montrent les exemples donnés par (ibn) Manẓūr. Cependant, il n’est pas possible pour le moment d’attester de l’ancienneté du terme, ni du temps de son apparition dans la langue arabe, puisque (ibn) Manẓūr débute son entrée par une connotation musicale «الْحُنُّ: مِنَ الْأَصْوَاتِ الْمَصْنُوعَةِ الْمَوْضُوعَةِ، وَجَمَعَهُ الْاَلْحَانُ وَالْحَوْنُ» avant de poursuivre avec la compréhension de *lahn* selon l’islam pour ensuite donner d’autres références ayant lien à la musique dont «والْحُنُّ فِي قِرَاءَتِهِ إِذَا عُرِدَ وَطُرِبَ فِيهَا بِالْاَلْحَانِ الْحُنُّ الَّذِي هُوَ الْبِنَاءُ وَتَرْجِيحُ» «الصَّوْتِ وَالنَّطْرِيْبُ وَيَقَالُ: فَلَنْ لَا يَعْرِفُ لِحُنِّ هَذَا التَّمْرِ أَيْ لَا يَعْرِفُ» «كَيْفَ يُخْبِرُهُ». Pour toutes ces définitions et exemples, voir [Manẓūr (ibn – 1232-1311), 1981, p. 4013-4015].

<sup>22</sup> Degré arabe considéré de nos jours, dans les pays arabes, comme l’équivalent du *ré* occidental.

<sup>23</sup> Repris par Ronzevalle dans [Mashāqa, 1913, p. 86].

<sup>24</sup>  $\flat$ : pour une note demi-bémolisée (abaisse une note de l’équivalent d’un quart de ton);  $\sharp$ : pour une note demi-diésée, (hausse une note de l’équivalent d’un quart de ton).

<sup>25</sup> Pluriel de *burj*, «degré» comme expliqué précédemment dans l’intitulé.

<sup>26</sup> Pluriel de *nusf*, «moitié».

<sup>27</sup> Les degrés en «*tik*» ou «*nīm*» se rapportent exclusivement aux *ansāf*, et l’ensemble est asymétrique: tous les *ansāf* n’ont pas *et tik* et *nīm*, puisque, dans ce système (voir Tableau 1) le «*nīm-nahuf*» et le «*tik-‘ajam*» correspondent au degré *awj* et le «*nīm-bisalik*» et le «*tik-kurdi*» correspondent au degré *sikā*; dans une discussion privée, Amine Beyhom nous a fait remarquer cet état de fait et nous a indiqué qu’il était très important pour la compréhension du système intervallique de la musique arabe dans la période qu’il appelle «intermédiaire» (entre le XV<sup>e</sup> et le XVIII<sup>e</sup> siècles).

<sup>28</sup> [Mashāqa, 1849, p. 174].

<sup>29</sup> Voir la version française de Ronzevalle dans le tableau pour identifier les différences entre degrés.

<sup>30</sup> [Abou Mirad, 2007, p. 137], traduit le terme *lahn* par «mélodie» ou «formule mélodique».

<sup>31</sup> [Mashāqa, 1899b, p. 43].

<sup>32</sup> [Mashāqa, 1996, p. 64].

<sup>33</sup> Fatḥ-al-Lāh se réfère à cette édition en tant que manuscrit.

<sup>34</sup> على dans la version arabe [Mashāqa, 1913, p. 92].

<sup>35</sup> Dans [Mashāqa, 1913, p. 92], cette préposition est absente.

<sup>36</sup> [Mashāqa, 1996, p. 64]: Fatḥ-al-Lāh explique dans la note (1) «on veut dire par ce nom *Ushshāq* ture et son parcours est à la façon du *maqām Husaynī* sur le *dūkā* avec la nécessité qu’il s’imprègne du parcours du *jins rāst* sur le *nawā* avant de terminer sur le *Bayyātī*». Dans la note (2), Fatḥ-al-Lāh dit: «Dans la copie (S [س])[,] le degré *dūkā* est répété trois fois». Enfin, dans la note (3), Fatḥ-al-Lāh dit: «Dans la copie (Y [ي]) les deux dernières notes (*rāst*, *dūkā*) sont éliminées». Une quatrième note explique qu’elle transcrit littéralement sur portée ce que Mashāqa propose comme degrés pour ce *lahn*.

<sup>37</sup> [Mashāqa, 1849, p. 187-188].

<sup>38</sup> [Mashāqa, 1913, p. 40]. Nous avons gardé sans changement la façon de translittérer de Ronzevalle.

<sup>39</sup> La traduction de « *yulhiqūhu akthar ‘ulamā’ l bilād sh shāmiyya bilāhñ l Bayyātī* » paraît ambivalente, ici, puisque le sens de la phrase dans la traduction de Smith serait plutôt que les « savants » « ramènent » le *Dūkā* au *Bayyātī*, plutôt qu'ils font « succéder » le second au premier.

<sup>40</sup> [Mashāqa, 1996, p. 64], note n° 4.

<sup>41</sup> [*ibid.*].

<sup>42</sup> Revoir le Tableau 2 dans lequel figure sa version.

<sup>43</sup> Sa note n°2 au bas de la page 64 de [Mashāqa, 1996] explique, que dans la version de Ronzevalle, *dūkā* est répétée trois fois, ce qui est vrai. Mais cette remarque n'a aucun lien avec sa traduction sur portée.

<sup>44</sup> [Mashāqa, 1913, p. 43]. Voir plus bas dans le texte.

<sup>45</sup> [Mashāqa, 1996, p. ٤ (ط)]: Fath-al-Lāh l'appelle « la version [ou « copie »] imprimée » (النسخة المطبوعة).

<sup>46</sup> La plus récente et qui ne correspond pas à la version française de Ronzevalle, ce qui laisse penser que c'est la propre traduction de l'auteur (Abou Mrad).

<sup>47</sup> [Abou Mrad, 2007], consulter la bibliographie de son article qui ne rapporte aucune autre source que les trois que nous citons.

<sup>48</sup> [Abou Mrad, 2007, p. 147].

<sup>49</sup> [Abou Mrad, 2007, p. 147]. Il est très possible que l'auteur se soit trompé et ait mélangé deux mélodies en une seule parce que sa transcription en trois mesures ne contient pas le texte complet tel qu'il l'a traduit. Cependant, nous n'avons pas trouvé à quel texte arabe du traité de Mashāqa cette traduction pourrait correspondre, même avec l'erreur.

<sup>50</sup> [Abou Mrad, 2007, p. 140].

<sup>51</sup> De la racine arabe *zahara*, qui signifie principalement d'après le dictionnaire classique arabe, le *Murjīd* [Ma'lūf, 1997, p. 482]: « se montrer après s'être caché, se manifester » (ظهر ظهوراً؛ برز بعد الخفاء). Cependant le terme peut être une variante d'un autre dérivé de cette même racine et signifier dans ce cas: « cacher derrière son dos » (أظهر (الشيء؛ جعله وراء ظهوره). Il existe d'autres significations mais nous n'allons pas nous y attarder; nous voulions simplement souligner qu'un terme peut, en partant d'une même racine, avoir plusieurs sens pouvant être contradictoires.

<sup>52</sup> Dans le dictionnaire de traduction Arabe-Français, le [Abdelnour, 2008, p. 326], ce terme signifie: « qui contient une allusion, une insinuation ». Dans le *Murjīd* [Ma'lūf, 1997, p. 733], le mot signifie: « indiquer quelque chose, montrer [du doigt] » (لمنح تلميحاً إلى الشيء؛ أشار إليه).

<sup>53</sup> Il note à la page 139 de son article que cette méthode d'énoncer les mélodies est héritée et découle d'une tradition. Nous avons vérifié les sources indiquées par Abou Mrad. Cependant, rien ne prouve que c'est la seule traduction possible de ces termes et que la rythmique est sous-entendue par ces mots. Il s'agit bien d'une hypothèse parmi d'autres et Abou Mrad ne le dit pas, laissant sous-entendre que l'interprétation rythmique qu'il propose est la seule valable; cet auteur a même sorti un CD [Abou Mrad, 2006] avec ce type d'interprétation.

<sup>54</sup> Et par « en appuyant », en d'autres endroits du traité.

<sup>55</sup> [Mashāqa, 1913, p. 6]. Ronzevalle reproche à Mashāqa de ne pas l'avoir fait lui-même.

<sup>56</sup> Fath-al-Lāh et Abou Mrad en l'occurrence.

<sup>57</sup> Acquis en 2009 par reproduction de la Bibliothèque Orientale (à partir de ce point « BO ») à Beyrouth, les Ms. BO 220 et BO 221 sont en notre possession.

<sup>58</sup> Catalogue, p. 133, qu'on retrouve sur [Université St-Joseph (Liban), 2012a].

<sup>59</sup> [Mashāqa, 1899, p. 4].

<sup>60</sup> Page 134 du catalogue – [Université St-Joseph (Liban), 2012b].

<sup>61</sup> [Mashāqa, 1899, p. 4].

<sup>62</sup> Ms. BO 220 – [Mashāqa, 1887, p. 58].

<sup>63</sup> [Mashāqa, 1913, p. 40].

<sup>64</sup> [Mashāqa, 1913, p. 116-120].

<sup>65</sup> Le numéro de la page est indiqué en haut au milieu et entouré d'un ovale en pointillés. Les deux ovales dans le texte entourent chacun « *dūkā rāst* » et les deux hexagones chacun un « *dūkā* »; le premier *lahñ* commence avec la première parenthèse (en pointillé) sur la première ligne et finit sur la deuxième parenthèse de la huitième ligne.

<sup>66</sup> [Mashāqa, 1913, p. 3-4 et 116-117].

<sup>67</sup> Cette image et les suivantes ont été traitées pour plus de lisibilité.

<sup>68</sup> Nous pensons, pour le moment et à la lumière des indices que nous avons, que ce manuscrit (C) est probablement celui de El-Khoury. Notons aussi que ce manuscrit est probablement un autographe, écrit de la plume de Mashāqa (il n'y a pas d'indication ou de nom de copiste), ce qui ajouterait à la valeur de son contenu par rapport aux manuscrits de la BO qui sont des copies.

<sup>69</sup> Quant au manuscrit (D), qui se trouverait à Damas, il est pour le moment difficile d'aller enquêter et d'essayer de le trouver, mais nous espérons pouvoir un jour le faire.

<sup>70</sup> En commençant de gauche à droite, le *do* correspondant au *rāst* et ainsi de suite.

<sup>71</sup> Les deux ovales entourent chacun « *dūkā rāst* » et les deux hexagones chacun un « *dūkā* ».

<sup>72</sup> Et que nous avons pu retrouver.

<sup>73</sup> Mashāqa était en contact, selon ses biographes et comme nous avons pu le voir, avec des Occidentaux et avait probablement, puisque s'intéressant à la chose musicale, pu se familiariser avec la notation occidentale (ou en avait simplement connaissance).

<sup>74</sup> Et selon l'auteur lui-même en introduction à son épître – voir par exemple la 2<sup>e</sup> page du Ms. BO 220.

<sup>75</sup> Non musicien ?

<sup>76</sup> L'introduction de l'épître nous montre que l'émir avait demandé à Mashāqa d'écrire quelque chose sur la musique et c'est la raison pour laquelle elle lui est dédiée à travers l'intitulé. Mashāqa nous dévoile un intéressant détail, toujours dans cette introduction, en expliquant qu'il n'avait pas l'expérience nécessaire pour rédiger un travail de ce genre mais qu'il a dû faire beaucoup de recherches avant d'établir son texte. Ceci pourrait être la cause des (et une réponse aux) énoncés musicaux littéraires. Et n'oublions pas pour autant que Mashāqa aurait très bien pu comprendre au cours de ses recherches l'importance de l'apport « oral » pour cette musique, notamment en ce qui concerne son apprentissage; mais d'autres raisons, qui restent inconnues à ce jour, pourraient être à la base des énoncés musicaux dans son épître.

<sup>77</sup> Reproduction numérique de la portée de [Abou Mrad, 2007, p. 166]. Cet exemple musical rappelle, selon Riccardo Eichmann (communication d'évaluation du présent article datée du 17/04/2012) le système d'ornementation introduit par (al-) Hītāmī en 1983 en Égypte (nous n'avons pu retrouver que la référence de cet ouvrage – el Hītāmī: *Majmū'at al-mūsīqā al-ālīyya* [Classical instrumental music of Egypt] (Cairo, 1983) – dans le *New Grove* [Wright, Poché, and Shiloah, 2001]).

<sup>78</sup> Reproduction de la portée de Fath-al-Lāh dans [Mashāqa, 1996, p. 64].

<sup>79</sup> Les degrés sont représentés par déduction de l'énoncé de Mashāqa et rangés du plus grave au plus aigu avec les degrés correspondants en arabe et translittérés.

## كشف الأسرار عن كركرة الأخبار في تأويل الأدوار

### KASHF AL-ASRĀR ʿAN KARKARAT AL-AḤBĀR FĪ TAʾWĪL AL-ADWĀR<sup>1</sup>

Amine Beyhom\*

“In guise of introduction”<sup>2</sup>

The reason behind this article is such that I feel compelled to write it down as an introduction.

As I was researching the first issue of my book on the theory and practice of Arabian music [Beyhom, 2010c], I was amazed at certain texts which were either written in the form of *urjūzāt*<sup>3</sup> or attempted at explaining the unexplainable as if it were common truth. I reacted in an Occidental manner expecting rationalism in an irrational planet. However, I was not alone in my wonderings, as my parallel research on the Indian musical scale was gradually showing that there was no satisfactory explanation to the phenomenon of the well-known 22 *śrutis*<sup>4</sup> to an octave.

Having spent years studying various forms of octave divisions<sup>5</sup> as well as meticulous analyses of specific scores,<sup>6</sup> I found myself on the way of solving, gradually, a good deal of Arabian music riddles which had always intrigued me. At the same time, I was struggling with my understanding of the *śruti* for the reason that early Indian treatises are written in Sanskrit, a language which is obscure to me. Neither could I understand commentators<sup>7</sup> and read the treatises in their original languages and attempt at understanding if previous researchers did not wear blinkers<sup>8</sup> comparable to the ones of their counterparts for Arabian music.<sup>9</sup>

These approaches of a wide panel of music theories, combined with a critical point of view on previous Pythagorean-biased and nationalist-influenced<sup>10</sup>

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studies allow me, at present, to make two hypotheses for riddle solving, characteristic of modal musicology.

### THE 28 “QUARTERTONES” OF SHIHĀB-A-D-DĪN (19<sup>th</sup> CENTURY)

A poet and scholar,<sup>11</sup> *Shaykh*<sup>12</sup> Shihāb-a-d-Dīn Muḥammad ibn Ismāʿil ibn ʿUmar al-Makkī al-Ḥijāzī<sup>13</sup> studied at (al-) Azhar university in Cairo. In a treatise published in 1864,<sup>14</sup> *Safīnat al-Mulūk wa-Nafīsat al-Fulūk*, Shihāb-a-d-Dīn describes a division of the octave in 28 “quarters”. This division attracted many musicological considerations, most of them inspired by Scott Marcus’ opinion that the Sheikh did not really understand the music he described<sup>15</sup>. At least one Egyptian musicologist, on the other hand, tends to agree that the Sheikh was “the real inventor of the 24-quarternotes scale”,<sup>16</sup> and denies the fact that the latter division seemed to be already present in the Middle-East at the time: the Lebanese Mikhāʿil Mashāqa tells us that he had heard from it in about 1820, in Damascus, from Sheikh al-ʿAṭṭār.<sup>17</sup>

We will attempt at showing, in the next sections, that Shihāb-a-d-Dīn’s division is probably a continuation of previous attempts with the Arabian scale, and that his thoughts may have shifted towards a *practical* way of explaining the music he wrote about.

### Shihāb-a-d-Dīn’s explanations of the “quarters”

As a first observation of Shihāb-a-d-Dīn’s scale, it is possible to say, indubitably, that the Sheikh attests of 28 “quarters”<sup>18</sup> in his treatise.

In his *Safīnat al-Mulūk* the author explicitly counts 28 *maqāmāt* which are differentiated pitches within the octave, as shown from the lithographic version (Fig. 1):

“and the number of *maqāmāt* is twenty-eight, divided into *uṣūl* and *furūʿ*; as for the *uṣūl*, their number is seven only, and they hold names ordered in ascension [...] and the first is *Y[Ā]JKĀ*<sup>19</sup> and the second *DŪKĀ* and the third *DŪKĀ* [sic. See endnote and Figure 2]<sup>20</sup> and the fourth [p. 12] *JAHĀRKĀ* [or *JHĀRKĀ* or *GAHĀRKĀH*, etc.] and the fifth *BANJKĀ* [other possible transliterations] and the sixth *SHĀSHKĀ* and the seventh *HAFKĀ* [... p.13] concerning the *furūʿ*, their number is twenty-one and they are divided in three [types] into ‘*arabāt*, *nīmāt* of ‘*arabāt* and *tīkāt* of ‘*arabāt* according to the distance [«the interval»<sup>21</sup>] between the degrees, and the proof of this is that the interval [*al-burʿ*] comprised between two *uṣūl* of the seven cited can be complete and is called a *burda*, and can be [... p. 14] incomplete and is called a ‘*araba* or a *nīm* of ‘*araba*; because if you emit a sound beginning with one of the seven *uṣūl* and move on [upwards] you cross either the distance of the interval between [the *aṣl*] and the following degree, and you stop there [on it], or you cross [only] half, or a quarter or three-quarters of the distance, and you halt there. By crossing the complete distance and stopping there, you stop on the *burda*, and the interval [*buʿd*] is complete; by crossing half the distance and stopping there, you are on the ‘*araba*, and if you cross a quarter

only, you stop on the *nīm* of the ‘*arabā* which is its half, and the half of the half is the quarter; by crossing three-quarters of the distance, you stop on the *tīk* of the ‘*arabā* and the distance [*bu‘d*] will be incomplete. In this, the consequence is that the number of the ‘*arabāt* is seven, as well as the number of the *nīmāt* and of the *tīkāt*, and that each of the seven ‘*arabāt* is between two of the degrees of the *uṣūl*.”<sup>22</sup>



Fig. 1.1 to 1.4 Excerpts from pages 11, 12, 13 and 14 of the lithographic edition of Shihāb-a-d-Dīn’s *Saḥnāt al-Mulūk wa Naḥsāt al-Fulūk* explaining the process of division of the octave in 28 *maqāmāt*.<sup>23</sup>

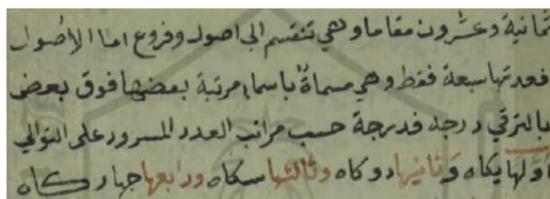


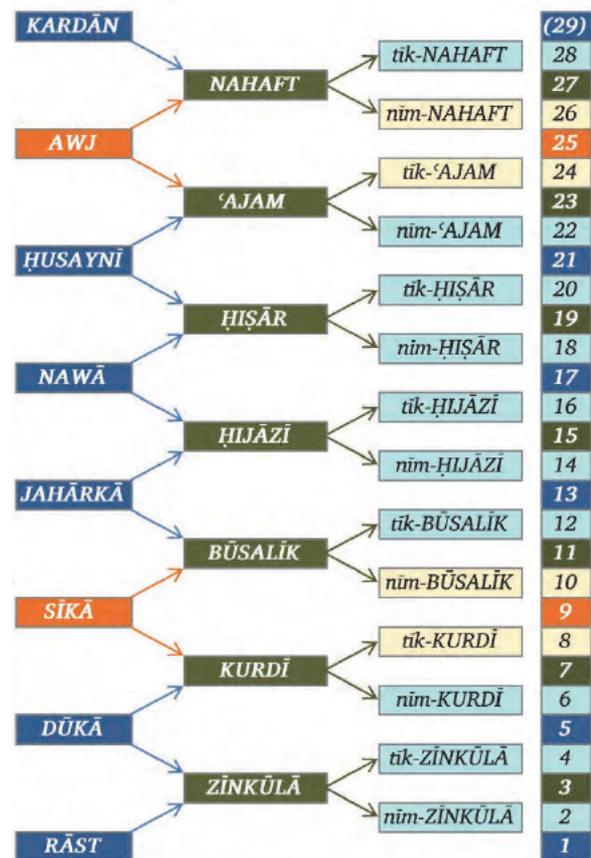
Fig. 2. Excerpt from the Ms. z 2935<sup>24</sup> matching our excerpt (Fig. 1.1) from page 11 of li 1864 above: the third degree (*aṣl*) is clearly here *SĪKĀ*, and not *DŪKĀ* as written in the lithographic copy.

Shihāb-a-d-Dīn also explains [1864, p.14–15] how the names of the main degrees of the scale evolved and became the ones shown in Figure 3.<sup>25</sup>

KARDĀN	↔	rā <sub>2</sub>	c'
AWJ	↔	aw <sub>2</sub>	b <sup>hf</sup>
ḤUSAYNĪ	↔	ḥu <sub>2</sub>	a
NAWĀ	↔	na <sub>2</sub>	g
JAḤĀRKĀ	↔	ja	f
SĪKĀ	↔	sī	e <sup>hf</sup>
DŪKĀ	↔	dū	d
RĀST	↔	rā	c

Fig. 3. Modern names of the main scale degrees of Arabian music<sup>26</sup> (left) and proposed solmisation (2<sup>nd</sup> column from the right); corresponding Western pitches are shown in the column to the right.<sup>27</sup>

The author mentions the names of the seven ‘*arabāt*, which are *ZĪNKŪLĀ*, *KURDĪ*, *BŪSALĪK*,<sup>28</sup> *ḤĪJĀZĪ*, *ḤIṢĀR*, ‘*AJAM*<sup>29</sup> and *NAHAFT*.<sup>30</sup> Adding to them the *tīkāt* and *nīmāt*, which are alterations of the ‘*arabāt* in the upper or the lower direction, we have the 28 “*maqāmāt*” of *Shihāb-a-d-Dīn* (Fig. 4).



7 *burdāt* + 7 ‘*arabāt* + 7 *tīkāt* + 7 *nīmāt* = 28 “*quarters*”

Fig. 4. The “*maqāmāt*” of Shihāb-a-d-Dīn divided into *burdāt*, ‘*arabāt*, *tīkāt* and *nīmāt*.<sup>31</sup>

However, this contradicts the Modern Arabian theory of the “quarters”, since 24 quartertones in an octave can not sum up to 28 “quarters”, unless the “quarters” are not equivalent to “quartertones”.<sup>32</sup>

As a conclusion to this point, let us note that Caron and Safvate (among others), in their retrospective study of the music of Iran,<sup>33</sup> underline that *Shihāb-a-d-Dīn*’s division corresponds to the seven main intervals of the Arabian scale, commonly stated in modern literature as composed of one-tone and three-quartertones intervals, in further halves and quarters of “tone”, regardless of the values of the “tone”<sup>34</sup> (Fig. 5).<sup>35</sup>

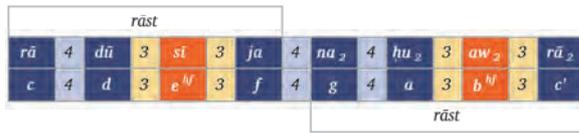


Fig. 5. Modern division of the octave of Arabian music in quartertones and two ascending *rāst* tetrachords (*c d e<sup>hf</sup> f* and *g a b<sup>hf</sup> c<sup>g</sup>* – “hf” stands for “half-flat”) joined by a “disjunction” tone (*f,g*).

The way to 28

Nowadays, the basic scale of Arabian music is usually given as a two-octave scale composed of one-tone and three-quartertones intervals (Fig. 6).

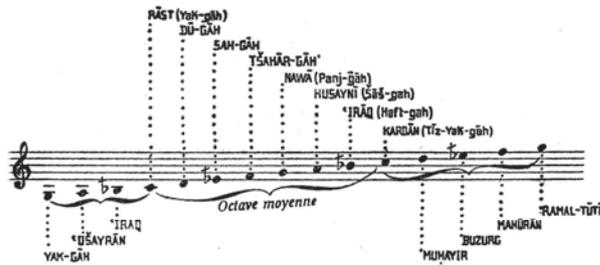


Fig. 6. Basic scale of the Arabian music according to Erlanger<sup>36</sup>:  $\text{♯}$  stands for “half-flat”.<sup>37</sup> The scale of Figure 7 corresponds to the first ascending octave on this figure.

It is important to keep in mind that the equal-quartertone division was implemented very late in the history of this music, under the influence of the Western 12-semitone scale.<sup>38</sup> Moreover, the equal-quartertones scale is far from corresponding exactly to the intervals used in the performance of Arabian music.<sup>39</sup> As a matter of fact, Arabian musicology still fails to determine which were the actual intervals used in early Arabian music, albeit clues exist in the specialised literature.<sup>40</sup>

Before we examine these clues and use them to explain the formation of *Shihāb-a-d-Dīn*’s scale, let us have a closer look at the scale which can be deduced from the anonymous *A-sh-Shajara*<sup>41</sup> and from the (a-ṣ-) Ṣafadi epistle. In these treatises,<sup>42</sup> the authors also use the

concept of *burdāt* for the main degrees of the scale, but also *aṣṣāf*, which are “halves” of the intervals.<sup>43</sup>

The resulting scale, expressed with nowadays Arabic names of the degrees, is showed in Figure 7. The scale comprises seven so-called “tone-intervals” (but the “tone” is undefined) with their “halves”,<sup>44</sup> which amounts to 14 intervals (“halves”) per octave.

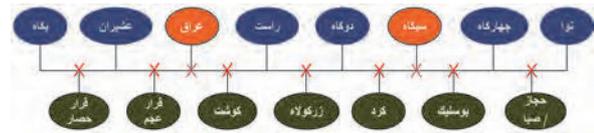


Fig. 7. The basic scale of Arabian music from *G* to *g* (left to right), with the seven *uṣūl* or *burdāt* (blue and orange ovals in succession above standing for *G a b<sup>hf</sup> c d e<sup>hf</sup> f g* – “hf” stands for “half-flat”) and the *aṣṣāf* (green ovals below *G<sup>#</sup> a<sup>#</sup> b<sup>#</sup> c<sup>#</sup> d e<sup>#</sup> f<sup>#</sup> g<sup>#</sup> or a<sup>b</sup> b<sup>b</sup>? c<sup>b</sup> d<sup>b</sup> e<sup>b</sup>? f<sup>b</sup>? g<sup>b</sup> a<sup>b</sup>*). The names of the upper degrees are, from left to right, *YIĀJKĀ USHAYRĀN IRAQ RĀST DŪKĀ SĪKĀ JAHĀRKĀ and NAWĀ*; the lower notes are (same direction) *qarār-HĪṢĀR qarār-AJAM KAWASHT ZIRKŪLĀ KURD BŪSALĪK and HĪJĀZ (or ṢABA)*.<sup>45</sup>

The study of the (a-ṣ-) Ṣafadi epistle shows that this division might have been too rough for his time, as the author uses a differentiation between “upper half” and “lower half”.<sup>46</sup> This could have meant a division in three of the “tone-intervals”,<sup>47</sup> or a further division in two of the “halves” resulting in “quarters” which would correspond to *Shihāb-a-d-Dīn* description of the scale.

However, the remaining question is to know what the nature of these “quarters” is, and how we can fit 28 “quarters” into the 24 quartertones one octave can normally contain.

Fitting 28 in 24

Let us first stress that the *Rāst* scale shown in figures 3 to 6 is quite recent in Arabian music, and that the first Arabian philosophers and theorists, mostly inspired by Ancient Greek theories,<sup>48</sup> used scale constructions<sup>49</sup> which favoured a regular perfect-fourth tetrachord + perfect-fourth tetrachord<sup>50</sup> build of the scale based on the tuning of the *ūd* in fourths (Fig. 14), resulting in what is today commonly known as the scale of the *maqām Yākā* (Fig. 8, Fig. 9).<sup>51</sup>

As I have argued elsewhere,<sup>52</sup> I strongly suspect that an equal string-parts construct (Fig. 14) was the originating point of the Arabian scale; 9<sup>th</sup> and 10<sup>th</sup> century polymaths such as (al-) Fārābī and (ibn) Sinā, who gave detailed theoretical explanations on the Arabian scale of their time, used equal-division of the string together with the Pythagorean so-called “diatonic” division in their description of the positioning of the fingers on the neck of the *ūd*.

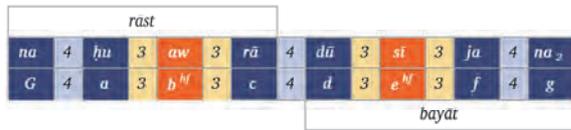


Fig. 8. First of two possible representations of the *maqām Yākā* scale commonly ascribed in contemporary literature with a lower (to the left) *rāst* tetrachord (↑4 3 3 – the “↑” is used for highlighting the ascending direction of the intervals) on G, and with an upper *bayāt* tetrachord (↑3 3 4 beginning on d).<sup>53</sup>

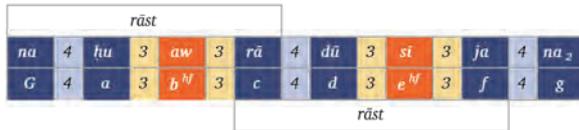


Fig. 9. Second of two possible representations of the *maqām Yākā* scale; this may be the original construct of the scale, with two conjunct *rāst* tetrachords (on G and c) completed (for the octave) by a “one-whole-tone” interval (between f and g).

The equal string-parts construct was used in particular<sup>54</sup> to determine finger positioning of the so-called “*zazalian*” intervals, known as “neutral” intervals in most of the Western specialised literature;<sup>55</sup> these intervals are at the core of modern Arabian and *maqām* music, and seem to be present from the origins of this music. There is however to date no proof that this equal string-part construct was used as the main basis for the division of the octave, although strong hints of its presence are present in the early Arabian literature on music.

Nonetheless, we know that at the time Shihāb-a-d-Dīn wrote his treatise equal division of the string was in use in music theory<sup>56</sup> and that the favoured string instrument of the Ottoman empire (which still ruled Egypt at that time) was the *ṭunbūr*,<sup>57</sup> (including for Byzantine music theory and teaching – Fig. 10)<sup>58</sup> and that other long necked lutes, such as the *nashʿat-kār*<sup>59</sup> (Fig. 11) usually tuned in alternated fifths and fourths, were in favour at that time and later (Fig. 12), besides evidently the introduction of the European violin in the Arabian musical instrumentarium. We also know that the most important to date Arabian Modern theorist, Mikhāʿil Mashāqa, used the *ṭunbūr* for his theoretical demonstrations (Fig. 13).

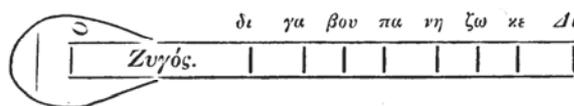


Fig. 10. Chrysanthos of Madytos’ depiction of a “*ṭunbūr*”, used in his explanations about Byzantine music, for theoretical purposes.<sup>60</sup>

So what if *Shihāb-a-d-Dīn* based his division of the octave on such an instrument tuned in alternative fifth(s) and fourth(s)?<sup>61</sup> The answer lies in Figure 15, which shows such a construct with a division of the octave on two strings tuned in fifth in 28 “quarters”, or equal string-parts, the upper fifth being divided in 16 equal parts and the lower fourth in 12 equal parts, which together amount to 28.

The main degrees are obtained from a division of the string in 12 equal parts; then these parts are divided in two in order to obtain the *ansāf* or “halves” of tones (which are now defined, but different from one another), with these halves divided in turn in two parts which give 4 “quarters” in one “tone”, which multiplied by 7 (main “tone” intervals) amount to the 28 “quartertones” of *Shihāb-a-d-Dīn*.

We can deduce from this hypothesis that the resulting main scale of Arabian music in the time of *Shihāb-a-d-Dīn* would be *d e<sup>hf</sup> f g a b<sup>hf</sup> c’ d’* (or ↑3 3 4 4 3 3 4 in standardised “quartertones” – the “↑” is for highlighting the ascending direction of the scale) which, if started on its fifth scalar degree and then transposed down an octave (starting on G) gives us the scale of *maqām Yākā* shown in Figure 9, with a standardised ↑4 3 3 4 3 3 4 (in quartertones) scale.<sup>62</sup>

In the *Shihāb-a-d-Dīn*’s construct as I propose it in Figure 15, however, the so-called “three-quartertones” intervals of the modern Arabian theories are conceptually closer to *Ṣafīyy-a-d-Dīn al-Urmawī*’s *mujannabāt*,<sup>63</sup> with a “small *mujannab*” between *d* and *e<sup>hf</sup>* on the first string (approx. 151 cents), and between *a* and *b<sup>hf</sup>* on the second, and a “great *mujannab*” between *e<sup>hf</sup>* and *f* on the first string, and between *b<sup>hf</sup>* and *c’* on the second (approx. 165 cents). The next intervals on the strings are the “minor tone” (approx. 182 cents) and the Pythagorean tone (approx. 204 cents).

This construct gives us a good idea of the process of the octave division and a good explanation for *Shihāb-a-d-Dīn*’s scale, but what if some *maqām* musicologist insisted that *maqām Rāst* scale is the only scale on which the Arabian general scale may be based?

The answer to this question lies again in starting the *Yākā* scale of Figure 9 a fourth higher (beginning on c), which gives us the typical ↑4 3 3 4 4 3 3 scale. Another clue for this is the fact that a common tuning of the *ūd* in the Middle-East today uses a supplementary string in the lower part of the scale, which is frequently tuned a major (or Pythagorean) tone lower than the next string, with results as a tuning in *G A d g c’* and *f’*.<sup>64</sup> Including the intermediate degrees *b<sup>hf</sup>* and *e<sup>hf</sup>* on the A- and d-tuned strings of Figure 14, we obtain a ↑4 3 3 4 4 3 3 scale which is the *maqām Rāst*.

This way of thinking gave me a clue as to the problematic of the 22-*ṣrutī* scale that I shall explain in the next sections.<sup>65</sup>



Fig. 11. A *nash'at-kār* made 1928 in Damascus by the famous lute-maker Anṭūn Nahḥāt.<sup>66</sup>



Fig. 12. The quality and production certificate (glued in the inner part of the belly) of the *nash'at-kār* in Figure 11.

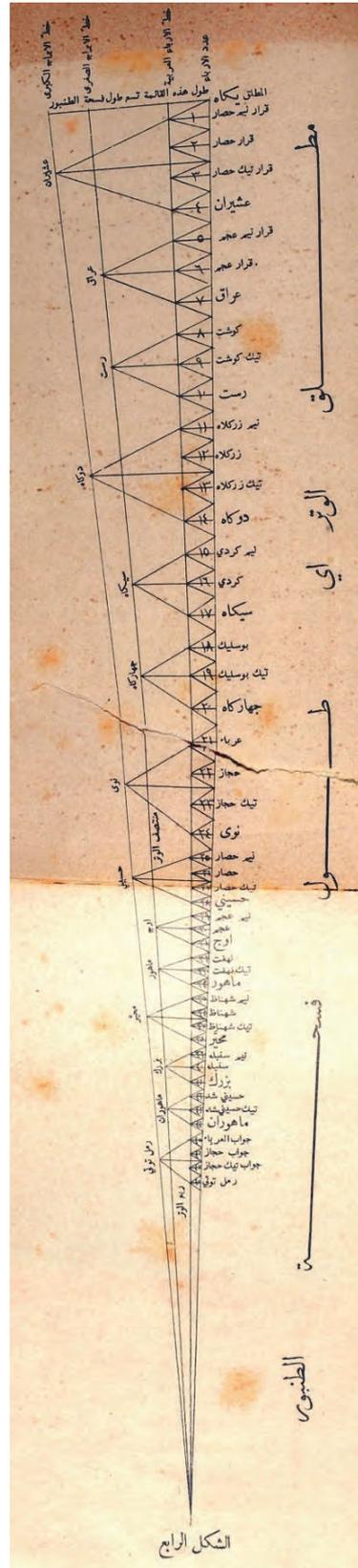


Fig. 13. Mashāqa's division of the string of the *turbūr* explaining how to establish an equal-division of the octave in 24 quartertones.<sup>67</sup>

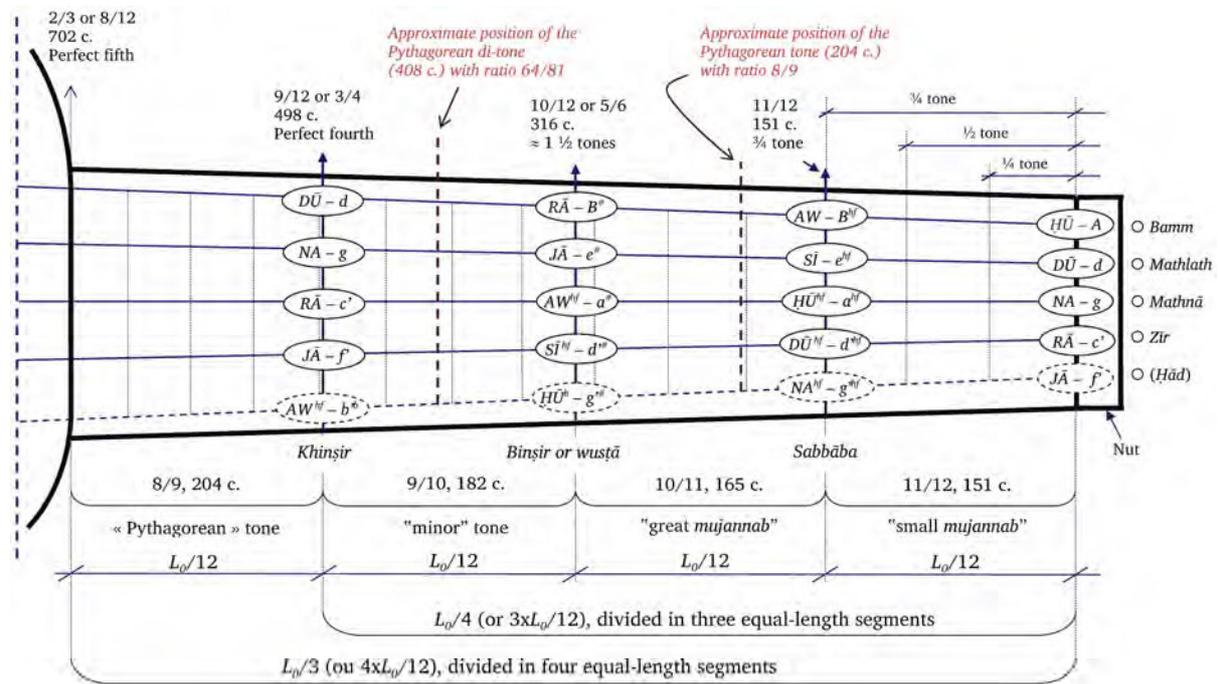


Fig. 14. The 12 equal string-parts construct based on a tuning of the *ūd* in fourths.<sup>68</sup>

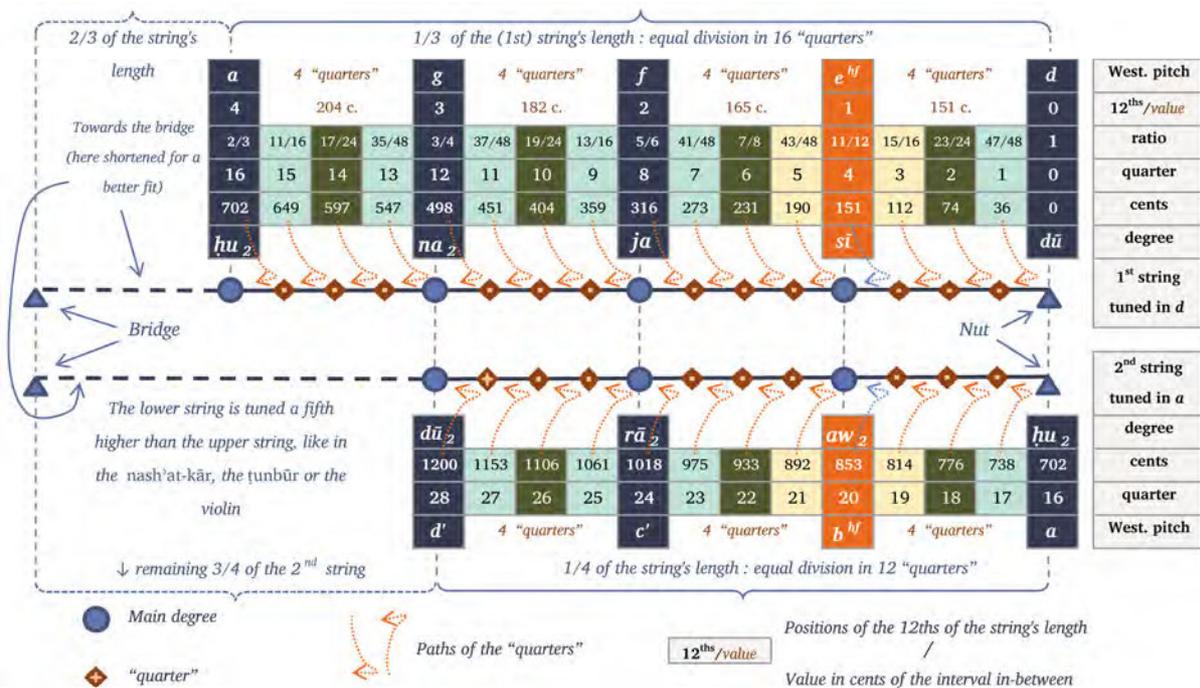


Fig. 15. An explanation of the construction of Shihāb-a-d-Dīn's scale in 28 "quarters" on the example of a "lute-type" string instrument tuned in fifth (or alternate fifths and fourths).<sup>69</sup>

*“It is impossible to say with any certainty  
whether it was the Pythagorean, the Just  
Intonation, or even some other major third  
which was used in ancient India”  
Nazir Jairazbhoy<sup>70</sup>*

#### A HYPOTHESIS ON THE FORMATION OF THE 22-ŚRUTIS SCALE

Twenty years ago, it would have been most unlikely that I would study Indian music. Fifteen years ago, and as I started reading about the theory of this music, it seemed an impossible task as there was only very little accessible material<sup>71</sup>. Ten years ago, I gave up on the *śruti*<sup>72</sup> system and decided to concentrate my efforts on Arabian music: there were enough riddles with this music to keep me and other musicologists busy for a few more decades.

However, and as there was more available specialised material due to digital archiving of scientific reviews and early books, I finally came across materials which, along with my continuous efforts to unveil Arabian or Byzantine music theory riddles,<sup>73</sup> triggered, at last, the solution that I am proposing in the present. I am first indebted to musicologists and writers, mainly Ananda Coomaraswamy<sup>74</sup> and Nazir Jairazbhoy<sup>75</sup>, and to Shihāb-a-d-Dīn al-Ḥijāzī whose 28 “quartertones” I believe to be a recent replication of a concept dating to the dawn of the literate period.<sup>76</sup> I am also greatly indebted to Ṣafiyīy-a-d-Dīn al-Urmawī whose scale with two unequal *mujannab(s)*<sup>77</sup> kept me busy for a long time before I could explain the fact that two intervals may be rather different in size, though conceptually equivalent.<sup>78</sup>

#### *The conceptual similarities between the Indian śruti scale and the Arabian scale*

To start with, I must confess that I always thought that the Indian and Arabian Art music were based on similar general rules, but that nationalism, Western influence, the different languages or simply the superficial cultural differences were preventing them to be compared.

The main influence of Western musicology was to be found in the avoidance of references to any possible existence of “neutral” intervals in Indian music (theory) and in the generalized use of Pythagoreanism in order to explain the scale and the intervals.<sup>79</sup> It is mainly through the effect of this musicology on local theorists that we may explain the stress on the octave scale as a whole, and not on smaller scalar, if not melodic units, *i.e.* the fourth and the fifth. Moreover, the Western tendency to idealize music as a science, a concept which spread very quickly among local musicologist (whether Arabs, Turks, Greeks

or Indians) enlisted in a competitive race trying to give their music a “respectable” basis (that is “Pythagorean”). A corollary to this is that music performance lost its role as the basis for theories, and that music theories *à la* European became the rule, apart from imposing normative instructions to the performers.

As a result of the refusal of the above influences, the hypothesis for the formation of the theory of the 22 *śrutis* I propose is based on one deduction and two assumptions.

- Firstly: the deduction to which I came after studying the internal composition of the “classical” *śruti* scale is that the  $\uparrow 4\ 3\ 2\ 4\ 4\ 3\ 2$  *śrutis* division found in Bharata-muni’s *Nāṭyaśāstra*<sup>80</sup> is, conceptually, very similar to the Arabian so-called “*zalzalian* scale”,<sup>81</sup> notably expressed by Ṣafiyīy-a-d-Dīn al-Urmawī in the 13<sup>th</sup> century.<sup>82</sup>
- Secondly: the first assumption I made was that the two Indian and Arabian general scales are not only conceptually equivalent, but that the original “tones” (*i.e.* the 4, 3 and 2 *śrutis* “tones” and the 4 and 3 “quartertones” of contemporary Arabian theories) should also be very close in practice, if not in theory. The assumption is that these intervals should be approximately the same in the original Indian music and Arabian music, and that the resulting theoretical intervals should express, at least in their proportions, the actual differences in sizes of the intervals used in performance.<sup>83</sup>
- Thirdly: the second assumption is that the Indian musical scale is originally based on the fourth, and that the *vinā* tuning should be the key to the solution.<sup>84</sup>

As the reader can deduce from these assumptions, I have tried to apply my knowledge of Arabian theories of scale formation to the problem of the construct of the *śruti* scale, with the results that I discuss below.

#### *Is the number of śrutis equal to 22 in an octave?*

The *śruti* system has challenged scholars for centuries, some of them discussing and disputing even the number of *śrutis* in the octave, as Kolinski puts it:

“[I]t is necessary to discuss the actual meaning of the allocation of twenty-two *śrutis* within one octave. For the supporters of the divisive concept it has been no easy task to arrive at the required number of *śrutis*. Hombostel and Lachmann have attempted to trace the origin of the system back to a hypothetical instrument supposed to be related to the Chinese *K’in*. After a whole series of alterations of the actual fingerboard of the *K’in* the two scholars finally arrive at a hypothetical fingerboard of Bharata’s *Vinā* which in fact includes twenty-two *śrutis* within the octave [...]; but a similar method would allow one to establish also any other desired number of *śrutis*. Fox-Strangways approaches the problem in a different way: he projects all 14 *murchanas*, that is, the whole of the theoretically possible modal varieties, mentioned by Bharata, into the same octave, but, unfortunately, gets only

twenty instead of the twenty-two expected *śrutis*; so he adds the lacking two *śrutis* ‘by analogy’.<sup>85</sup> Danielou [sic], on the contrary, was forced to eliminate one *śruti* when his calculations led him to the number of twenty-three.<sup>86</sup> Finally, Clements’ painstaking calculations yield twenty-five *śrutis* within the octave. This time, however, it is Bharata himself and the other old Indian theorists who are accused of having made a mistake, and Clements insists that the real number of *śrutis* is not twenty-two but twenty-five.<sup>87</sup> Still, the majority of the all-Indian Musical Conference has voted in favor of the consecrated number of twenty-two *śrutis* within the octave.<sup>88</sup>

Let us first note that the *śruti* is not an interval used as such in the scale, but should be considered as a “quartertone” of Modern Arabian theory, and as a component of such intervals, as Coomaraswamy writes:

“The scale of twenty-two notes is simply the sum of all the notes used in all the songs—no musician sings a chromatic scale from C to [c] with twenty-two stopping places, for this would be a mere tour de force. The ‘quartertone’ or *śruti* is the microtonal interval between two successive scale notes: but as the theme rarely employs two and never three scale notes in succession, the microtonal interval is not generally conspicuous except in ornament”.<sup>89</sup>

Let us also note that Kolinski, among other scholars, favours the harp-type *vinā* hypothesis<sup>90</sup> (and the cyclic one)<sup>91</sup> and bases his argumentation on Coomaraswamy’s article “The parts of a *Vinā*”.<sup>92</sup>

The simple solution that we propose for the *śrutis* scale formation is based on the (complementary) assumptions that the number of *śrutis* within one octave is effectively 22, and that the instrument cited in Bharata-muni’s *Nāṭyaśāstra* is a lute-type *vinā* (Fig. 18, Fig. 19).<sup>93</sup>

*The “small” Indian tones and Urmawī’s mujannabāt*

As I learned some time ago about performing *maqām Ṣabā* with my teacher and friend Saad Saab,<sup>94</sup> I came to the conclusion that not only the placement and intonation of the *SĪKĀ* and the *ĪRĀQ* degrees, equivalent in Middle-Eastern *maqām* theories to the Westernised *e<sup>fl</sup>* and *b<sup>fl</sup>*, are subject to changes according to the organology<sup>95</sup> and instrument making,<sup>96</sup> morphology<sup>97</sup> and *maqām* type, but that there are also two different positioning for (for example) *e<sup>fl</sup>*<sup>98</sup> degree according to the *family* type of the *maqām* or of the tetrachord.<sup>99</sup> In concrete terms and to put it simply, the *e<sup>fl</sup>* degree is much closer to “natural”<sup>100</sup> *e* in the *rāst* tetrachord than it is, for example, in the *bayātī* tetrachord, although both positions are considered to correspond to the *SĪKĀ* (*e<sup>fl</sup>*) degree.

As a result, in current practice the “neutral tones” or *mujannabāt*<sup>101</sup> in Arabian music are around 170 cents for the first, greater *mujannab* *M<sub>1</sub>*, and around 125 cents for the smaller one *M<sub>2</sub>*. The “one-whole-tone” interval is usually played at about 200 cents.

In the basic *maqām Rāst* of Arabian music, the scale may be (↑)T *M<sub>1</sub>* *M<sub>2</sub>* T T *M<sub>1</sub>* *M<sub>2</sub>*, where T stands for “one-whole-tone”, *M<sub>1</sub>* stands for “first (or greater) *mujannab*” (which is smaller than the one-whole-tone, but bigger than a semitone, whatever the latter may be), and *M<sub>2</sub>* stands for “second *mujannab*,” or “smaller *mujannab*” (which is smaller than the *first mujannab*, but still greater than one “semitone” interval). These *mujannab* intervals fit, conceptually if not in measurements, with the description given<sup>102</sup> by *Ṣafyy-a-d-Dīn al-Urmawī* about the two forms of *mujannab*, a “greater” one made out of two *limma* intervals, and a smaller one made of one *limma* + one (Pythagorean) *comma* (Fig. 16 – above). Urmawī, however, in his handling of tetrachords in Arabian music, uses the generic letter “ح” for the *mujannabāt* thus eluding theoretical differences between (L C) and (L L) as shown in Figure 16 (above); the intervals composing the *mujannabāt* intervals (Fig. 16 – below) are also approximately equal, which gives a supplementary indication in favour of an undifferentiated use of the two forms of the *mujannab* in (theoretical) practice.<sup>103 104</sup>

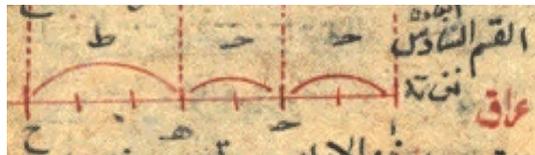
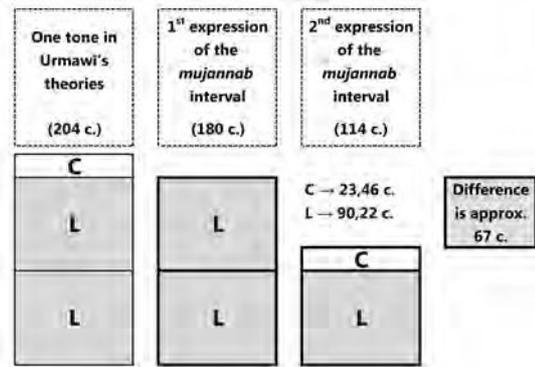


Fig. 16. Urmawī’s use of the *mujannab*: (above) explanation of the theoretical values of the *mujannabāt*<sup>105</sup>; (below) excerpt from a Ms. of the *Book of Cycles* by Urmawī<sup>106</sup> showing the undifferentiated use of the *mujannabāt* by the author (the letter “ح” – or “h” – above the two first intervals from the left) for the *Īrāq* genre (or tetrachord): both intervals “ح” (for “*mujannab*”) contain (roughly) equally divided smaller “elementary” intervals which compose them.<sup>107</sup>

In most of the current Arabian Middle-Eastern theories, the two forms of *mujannab* are also considered as equal, theoretically, and are equated to the three-quartertones interval, with the *maqām Rāst* scale expressed as ↑4 3 3 4 4 3 3 (in equal quartertones). However, *M<sub>1</sub>* and *M<sub>2</sub>* belong to early Arabian theory, and to nowadays (and yesterday’s recorded) Arabian music.<sup>108</sup>

It is difficult to equate the  $\uparrow 4\ 3\ 3\ 4\ 4\ 3\ 3$  (in theoretically equal quartertones) *maqām Rāst* scale in this form to the *śruti* main scale  $\uparrow 4\ 3\ 2\ 4\ 4\ 3\ 2$  (in *śrutis*) found in Bharata-muni’s treatise of music, equally as difficult as to equate the 24-quartertones scale with Shihāb-a-d-Dīn’s scale made up of 28 “quarters”.

However, considering performance practice that the  $T\ M_1\ M_2\ T\ T\ M_1\ M_2$  *maqām Rāst* scale is the closest to the intervals in praxis, we can compare this scale to the basic *śruti* scale  $\uparrow 4\ 3\ 2\ 4\ 4\ 3\ 2$  (in *śrutis* – see Figure 17 for an alternate formulation), on the basis that “*T*” = “4 *śrutis*”, “*M*<sub>1</sub>” = “3 *śrutis*” and “*M*<sub>2</sub>” = “2 *śrutis*”.<sup>109</sup> The two scales become thus conceptually equivalent, and the intervals are conceptually identical, if not (approximately) equal: the latter is the first of the two assumptions we made above; we examine the second assumption in the next section of this article.

	3	2	4	4	3	2	4	
sa	rī	gā	ma	pā	dha	ni	(sa)	
4	3	2	4	4	3	2		

Fig. 17. The *sa-grama* scale as explained by Kolinski<sup>110</sup>: The numbers in the lower row express the values of the leading (and ascending) intervals to the tone; the number in the upper row the values of the intervals between two successive tones: both interpretations have been challenged, although the  $\uparrow 4\ 3\ 2\ 4\ 4\ 3\ 2$  version seems to be today predominant.

### Two assumptions and one instrument

As I was undergoing research for my first book on Arabian music theory and practice, the preponderance of the *ūd* in early theories led me to undertake a detailed study of the origins of the instrument.<sup>111</sup> The result was that the first appearances of the short-necked (and unfretted) lute, either in the iconography or in literature, were situated beyond any doubt in Ancient India, close to the beginning of the first millenary a.d. This predates the Islamic-Arabian *ūd*, and the lute-*vinā* (Fig. 18, Fig. 19) is probably the direct ancestor of the Persian *barbat*, which seems to be an early form of the *ūd*.

Short-necked lutes are commonly unfretted instruments,<sup>112</sup> offering versatility for interval sizes. It is often difficult to make precise measurements in order to determine fret positioning,<sup>113</sup> or even to draw accurately fret marks on the finger-board. Halving a length is easier, with a... string.

Should we wish to determine, for example, the position corresponding to the fourth of a vibrating string, it suffices to fold an equal length string twice, and measure with the folded string the distance from the nut.

In Early Arabian music, further (equal) division of the string-part corresponding to the perfect fourth would be an easy task, and would result in the successive

tetrachords depicted on Figure 14. In the previous sections, we saw that further divisions of the resulting “tones” lead to a satisfactory interpretation of Shihāb-a-d-Dīn’s scale.

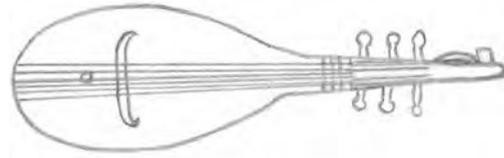


Fig. 18. Generic lute-type *vinā* depicted in *Amaravati*, *Nāgārjunakoṇḍa* and *Pawaya* (India), Gupta-period (320–480 a.d.).<sup>114</sup>

Now if we assume that early *vinā*(s) were tuned in perfect fourths, the next step would be to ask ourselves whether (and how) the string-part corresponding to the perfect fourth (i.e. one fourth of the string from the nut) could be divided in 9 equal parts, and what would be the result of such a division on the resulting scale.

Practically, dividing the fourth part of a string in 9 equal (more or less) parts was not challenging for the Early Indians: we have the privilege, in our time, to be able to compute very easily the resulting intervals.



Fig. 19. Line drawing of a musician playing a lute-type *vinā*.<sup>115</sup>

### The 22-śruti scale as an equal-division construct

The division in 9 equal parts of the string-part corresponding to the perfect fourth on the lute-type *vinā* is shown on Figure 20.

Dividing the first string (the upper string tuned in G in Figure 20) into 36 equal parts (i.e. of equal length), with 9 parts to the (perfect) fourth, we obtain a division which reproduces the *śrutis* spread in a perfect fourth as described in the Bharata-muni’s *Nāṭyaśāstra*, i.e. three “tones” in the fourth, with corresponding numbers of *śrutis* 4, 3 and 2. Let us call the first tone, with the 4 first *śrutis* (equal parts of the string), “Pythagorean,” as its length ratio is 8/9 [as (36-4):36 = 8/9]. It measures 204 cents.

We may decide to name the second “tone” “first (or greater) *mujannab*”, similarly to the Arabian theory.<sup>116</sup>

This *first mujannab* is made up of 3 *śrutis* (equal parts of the string divided in 36). It is theoretically equal to 170 cents. As for the *second mujannab*, it is made up of two *śrutis* (*idem*) and equates to 124 cents. We find equivalent “tones” in the second string, for the second perfect fourth (c-f). We thus obtain 6 degrees of the scale, containing successively 4 3 2 4 3 and 2 *śrutis*. The remaining “one-whole-tone” is obtained on the third string, with the resulting  $\uparrow 4\ 3\ 2\ 4\ 3\ 2\ 4$  scale (in *śrutis*).

Thus, *śrutis* are at the same time “equal” (as equal parts of the string) and “unequal” (as intervals measured by modern scientific methods<sup>117</sup>). Their exact value varies between 49 and 63 cents, with an average value of 55 cents.<sup>118</sup> This could explain why *śrutis* are considered as equal in Early Indian writings on music and that these *śrutis* are taken as unequal.<sup>119</sup>

Furthermore, transposing any scale in such a division<sup>120</sup> of the octave would result in small discrepancies due to the different sizes of the *śrutis* depending on their position on the fingerboard; this probably means that this division was taken as an *indication* for the effective positions of the fingertips on the fingerboard, *and* that this fingerboard was, consequently, *not* fretted.<sup>121</sup>

### Short discussion about the outcome

One of the objections to the theory of the 22-*śrutis* scale as an equal-division construct could be that the  $\uparrow 4\ 3\ 2\ 4\ 3\ 2\ 4$  scale is different from the  $\uparrow 4\ 3\ 2\ 4\ 4\ 3\ 2$  scale (both in *śrutis*), and that the scale deduced from Figure 20 begins on *pa* (G) and not on *sa*: my answer would be that the most important feature in this scale is the composition of the fourth, which is 4 3 2, and that by combining a fourth (4 3 2) with a one-whole-tone (4) and another fourth (4 3 2), we obtain *sa 4 ri 3 ga 2 ma 4 pa 4 da 3 ni 2 sa*.

Let us also remember that:

- Transpositions in fourths (or fifths) are frequent in melodic music, mostly whenever string instruments tuned in fourths (or fifths) are used in performance.
- Arabian lutes have a “zero” string that is very frequently (commonly) tuned in a “one-whole-tone” step with the first (second) string,<sup>122</sup> which gives us, if we start the scale a “one-whole-tone” lower,  $\uparrow 4\ 4\ 3\ 2\ 4\ 3\ 2$  (in *śrutis*). By starting the scale on the fifth degree we obtain *sa*  $\uparrow 4\ ri\ 3\ ga\ 2\ ma\ 4\ pa\ 4\ da\ 3\ ni\ 2\ sa$ .

Again, the octave is irrelevant in this matter since the fourth seems to prevail in Early and more recent<sup>123</sup> modal music.<sup>124</sup>

Now, with regard numbers 9, 4, 3, 2, and others that can be deduced from Figure 20, such as 36 (equal-parts of the string) and 29 (as the numerator of the 29/36 ratio of  $e^{\flat}$  and  $b^{\flat}$ ) what can be said? There may be religious or cultural explanations for those numbers, but I cannot resist the urge to propose another, simple explanation for their use in the construct.<sup>125</sup>

I have explained elsewhere<sup>126</sup> how numbers of small intervals composing a bigger conceptual interval can be used as qualitative markers for these intervals; in Şafiyiyy-a-d-Din’s theory of the scale, for example, the two *mujannab*(s) each host two intervals (Fig. 16), although the exact theoretical measures of this two-form interval are different. Conceptually, however, the two forms of the *mujannab* are considered by Şafiyiyy-a-d-Din (al-) Urmawī as being the same interval.

If we think of the numbers of *śrutis* amounting to an interval in the 22-*śrutis* scale, the 4, 3 and 2 clearly define different intervals, conceptually, although the exact measures of these intervals may slightly vary because of the positions of the *śrutis* on the fingerboard of the *vinā*. The question arising in this case is “why not begin with number 1 and use 3 2 and 1 for  $T\ M_1$  and  $M_2$ ?” The answer to such question can be given in three argumentative parts:

- Firstly: the numbers of small intervals composing the greater conceptual intervals must somehow reflect the actual sizes of the intervals; in this case, 124/204 as a ratio of cents value between the smallest “tone” (the “small *mujannab*”  $M_2$ ) and the “Pythagorean tone” of the 22-*śrutis* scale (Fig. 20) is closer to 2/4 (or 1/2) – which is the ratio of the *śrutis* contained in the corresponding intervals – than 1/3 in the other version.<sup>127</sup>
- Secondly: the 4 3 2 division of the fourth gives a perfect match for the Pythagorean tone as the result of the ratio 8/9, whenever 3 out of 24 divisions in all<sup>128</sup> in the “3 2 1” partition results in a 7/8 ratio.<sup>129</sup>
- Thirdly: the 29/36 ratio (374 c.), which may seem awkward at first, is a close match to the much simpler 4/5 ratio (approx. 386 c.),<sup>130</sup> and a practical way of approximating the latter.<sup>131</sup>

Another question that may arise is “why then only 9 *śrutis* in a fourth and not 10, 12 or more for more accuracy?”. There is a much simpler answer to this question: the main aim of this division of the octave was not *normative*, but *indicative*. In other words, the first objective of such a division would be to give simple *qualitative*<sup>132</sup> indications to the performer as how to perform a mode, and not to determine the exact sizes of the intervals in use.<sup>133</sup>

CONCLUSION

The equal division of the string is a plausible hypothesis for some of the scale constructs found in the *maqām* and other forms of modal music.

In this paper, I give two of these constructs, one of which is a full illustration of *Shihāb-a-d-Dīn*'s "28-quarters" scale; in the case of the 22-*śrutis* scale, further research is needed in order to determine whether the equal string-division may give answers and clues beyond the discussion undertaken here.<sup>134</sup> If such a hypothesis receives confirmation with Indian music, it would be legitimate to postulate that the introduction of the Western concept of "neutral" (i.e. "foreign") and "equal" intervals alongside (ironically) with the use of Pythagorean and just intonation concepts, and the evolution of concepts that ensued, transformed the Early *indicative* and *conceptual* theories into *normative* and *measuring* theories.<sup>135</sup>

This explains how the intervals which were in use until recently in the history of modal music were approximate,<sup>136</sup> tended to become fixed-sized intervals.<sup>137</sup> The normative trend represented by either equal-temperament or Pythagorean incantations to "science" prevent today most musicologists from understanding the basis from which early theories are built. This leads to very complicated explanations on phenomena which could well be, in substance, quite simple: these theories were mainly, if not all, conceptual in their essence, especially in the absence, in Ancient times, of accurate means of measuring intervals sizes.<sup>138</sup>

It suffices however to put aside Western misconceptions about modal music in order to find clues about early (or less early) theories, and to determine how they were distorted in the West, then afterwards or in parallel, in autochthonous modern musicology.<sup>139</sup>

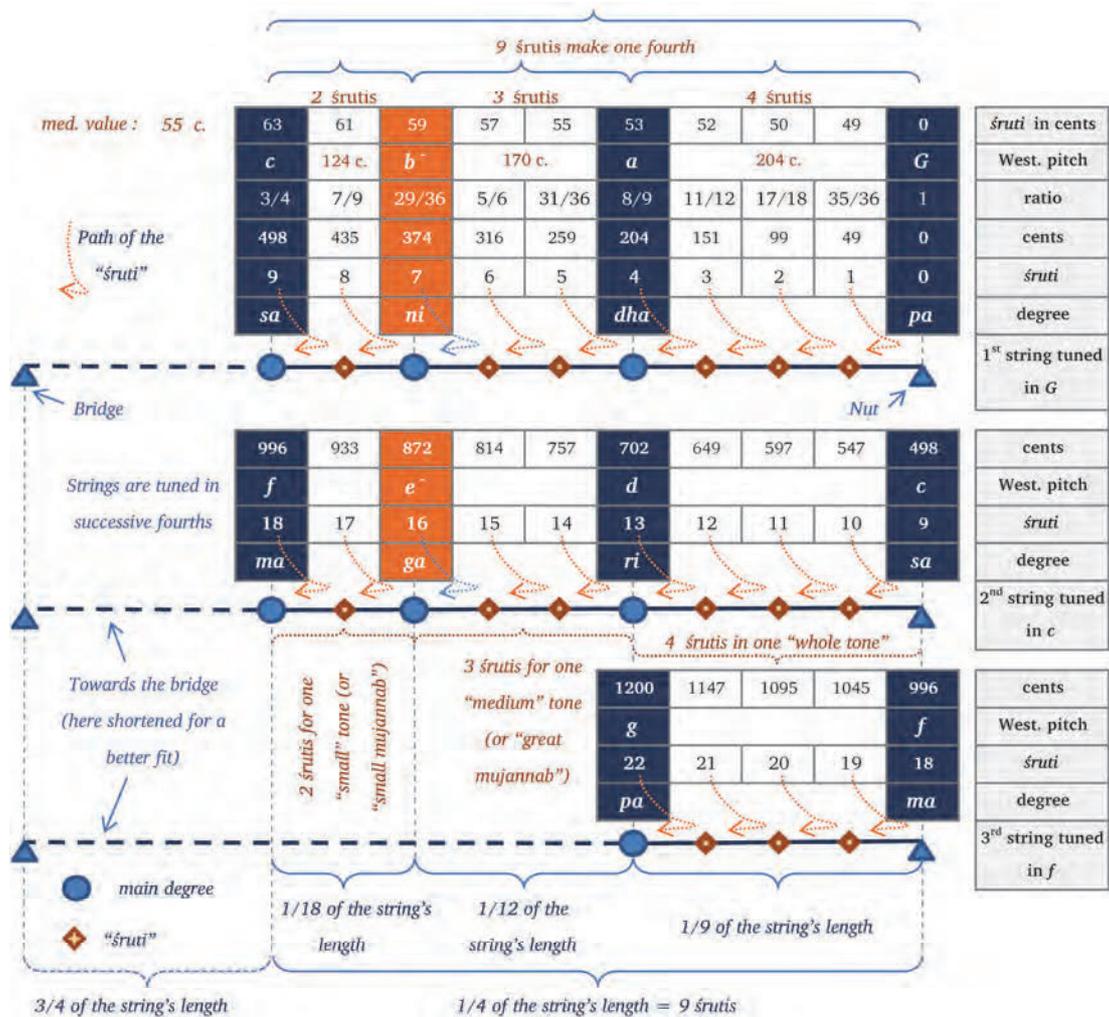


Fig. 20. Construction of the *śruti* scale based on a division in 9 equal parts (*śrutis*) of the fourth of the strings of the lute-type *vīnā*.<sup>140</sup>

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76. ZIRIKLĪ, Khayr-a-d-Dīn: *الأعلام* Al-A'lām (6), 5th ed. 6/8 (vols.), Dār al-'Ilm li-l-Malāyīn |Beyrouth, 1980-5|.

## Notes

<sup>1</sup> "Unveiling the repetitions of the scholars [another meaning for *ahbār* is priests] in explaining the modes." The three parts of the title are built in rhymes, as were often titles of poems and musical treatises in Arabian musicology. *Kashf al-Asrār*, or "Unveiling the secrets (of)" is a common beginning of titles of poems and treatises found in a wide panel of Arabian writings. The first part of this article is a tribute to my predecessors, mainly in the 19<sup>th</sup> and the 20<sup>th</sup> century, who "unveiled"

much. *Karkara[t]* means "repetition", and finds its contextual meaning with the following word *ahbār*, which means "prelates", "scientists", "scholars" – see [Ma'lūf, 1997, p. 678 & 113]. Most of the authors of the music "riddles" in modal music were prelates, who also happened to be scientists and scholars: these Uhr-musicologists have repeated the same or similar pattern of constructing the scale, albeit with differences in the details! As for *ta'wīl al-adwār*, the first term means

“explanation, interpretation, connected with” – see [Maʿlūf, 1997, p. 21], and *adwār* is used, at least since Safiyy-a-d-Dīn [Urmawī (al-), 1980; 1982; 1984; 1938] in the 13<sup>th</sup> century, as the original description of what could be called today a “modal scale” (an accurate study of the different ways of describing scales in relation to their modal characteristics is planned in [Beyhom, 2014], forthcoming). As a result, the title of this article is a tribute to all those, often prelates and scholars with cheerful spirit, who tried to explain, elucidate or transmit the problematic of the modal scale. As Ernest McClain affectionately put it in a recent correspondence [2012], “[t]he foundational attitudes of *Rg Veda* scribes is one of great amusement with themselves; it was pure genius to describe themselves as Holy Priests as ‘frogs croaking around a pond’”.

<sup>2</sup> “By way of introduction”. I would like here to thank François Picard, Professor at the Université de la Sorbonne and Scott Marcus, Professor at the UCSB, both being members of the Academic Board of NEMO-Online, for their useful (and numerous for the latter) comments, corrections and suggestions. I would equally like to thank Richard Dumbrill, our most respected administrator, for the huge amount of time he spent correcting my English.

<sup>3</sup> Plural of *urjūza*, a poem in the *rajaz* (corresponding to *mustafīlun* six times) prosodic meter ([Abdelnour, 2008, p. 62 & 69], [Maʿlūf, 1997, p. 250]).

<sup>4</sup> I use the plural for *śrutī* with an “s” (*śrutīs*), for reasons of convenience.

<sup>5</sup> For example the *lo-go* scales in my thesis [Beyhom, 2003b, p. 230–234 & 269–283], with variable numbers of intervals to an octave.

<sup>6</sup> See for example [Beyhom, 2003b; 2006a; 2006b; 2007a; 2007b; 2007c; 2007e; 2010a].

<sup>7</sup> Whose writings I could read only in some European languages.

<sup>8</sup> Mainly Pythagorean as I have tried to show in [Beyhom, 2010c], and as I plan to further demonstrate in [Beyhom, 2014] (forthcoming).

<sup>9</sup> In the meanwhile, the publication of my first book and the foundation of a research centre on Arabian music took also a lot of time and energy.

<sup>10</sup> The habit of differentiating music(s) whose general (and most important) features are so close that they should be originated from the same point: I document the influence of this nationalist attitude on the music in different regions of the *maqām* realm in [Beyhom, 2014] (forthcoming).

<sup>11</sup> Our main sources for Shihāb-a-d-Dīn’s biography are [Zirikī, 1980, v. 6, p. 38] and [Shiloah, 1979, v. 10, p. 327–328].

<sup>12</sup> A Muslim title for religious dignitaries, commonly translated as “Sheikh”.

<sup>13</sup> Born in Mecca, in the *Hijāz* (Arabia).

<sup>14</sup> There are a few manuscripts predating the published version of Shihāb-a-d-Dīn’s treatise [Hijāzī (al-Makkī al-), 1864], of which we know [Hijāzī (al-Makkī al-), 1843; 1855]; the latter are sometimes more accurate and were helpful in correcting typographical mistakes in the printed book as shown in Figure 2.

<sup>15</sup> See for example [Marcus, 1989, p. 71–72].

<sup>16</sup> This was for example the claim of Fathī (al-) Khamīsī, an Egyptian musicologist, during a conference organised by the Arab Academy of Music (AAM) in Cairo in 2007 [*The 1932 Congress on Music in Cairo, 75 years (A critical approach of the 1932 Congress on Arabian music held in Cairo in 1932)*]. This musicologist kept speaking in his conference about the “24-quartertones scale of Shihāb-a-d-Dīn,” and refused to answer our questions (with a few colleagues) about the fact that

Shihāb-a-d-Dīn clearly defines a 28-step scale in his treatise (the 28 “quarters”) and not a 24-step scale.

<sup>17</sup> Mashāqa has wrongly been ascribed as the “inventor” of the 24 quartertones scale common nowadays in the Middle-Eastern music theories: for a discussion on this matter and the fact that al-ʿAtṭār, as Mashāqa ascribes it, was well aware of this division, see Ronzevalle’s argumentation in [Mashāqa, 1899b, p. 4–5], or our [Beyhom, 2014] (forthcoming).

<sup>18</sup> Also called *maqāmāt* (plural of *maqām*).

<sup>19</sup> I use the following conventions for Arabian notes, tetrachords and modes (*maqāmāt*) names: a note name is written in capital letters, such as the degree *RĀST* (equivalent to the Western *c* in the Arabian contemporary theories of music); a tetrachord name is written in small letters, for example *rāst* for the tetrachord composed (in the same theories) of three successive ascending intervals comprising 4, 3 and quartertones each; as for the *maqāmāt*, I write them with a first (initial) capital letter, such as for *maqām Rāst*. This differentiation is helpful in such cases when all three *RĀST* note-degree, *rāst* tetrachord and *Rāst* mode bear the same name (please refer to the introductory part of my first volume on Arabian music [Beyhom, 2010c, v. 1, p. xvii–xxiv] for detailed information about the reasons underlying the use of *YĀKĀ* instead of *YAKAH* for example, or for other peculiarities of the transliteration).

<sup>20</sup> This should be “*SĪKĀ*” as in the Ms. z 2935 (Fig. 2).

<sup>21</sup> The author uses here the terms *masāfat al-buʿd*, which means “the distance of the interval” or, in another interpretation, “the distance corresponding to the interval”.

<sup>22</sup> [1864, excerpts from pages 11, 12, 13, 14 and 15].

<sup>23</sup> This lithographic version is referenced as *li* 1864 in this article.

<sup>24</sup> [Hijāzī (al-Makkī al-), 1864, feuillet 4 v<sup>o</sup>].

<sup>25</sup> The story of this evolution is complex and ascribed in [Beyhom, 2014] (forthcoming): we use in the following figures the standard contemporary names of the *burdāt* and *ʿarabāt*.

<sup>26</sup> Erlanger [1949, v. 5, p. 11–12] explains briefly the evolution of the names for these degrees.

<sup>27</sup> Degrees with orange background are the “neutral” *e* and *b* “half-flat”, and the degree *na* (*G* or *g*) determines the octave passage.

<sup>28</sup> Or *ʿUSHSHĀQ*.

<sup>29</sup> Or *NĪRIZ*.

<sup>30</sup> The vowels of most of these names may be different because of the lack of the former in the copy; the names are cited on [Hijāzī (al-Makkī al-), 1864, p. 14].

<sup>31</sup> The *ʿarabāt* figure on a dark green background (middle), the *tikāt* and the *nīmāt* on light green-blue and green-orange backgrounds. The result is a scale divided in 28 conceptually equal “quarters” (column to the right).

<sup>32</sup> We find clues to the latter and to the names used for the *maqāmāt* in two previous works on Arabian music, the anonymous *A-sh-Shajara dhāt al-Akrām al-Hāwiya li-ʿUṣūl al-Anghām* [Anonyme, 1983], and the treatise on music of *a-ṣ-Ṣafādī* [[Ṣafādī (a-ṣ-)], 1991]; Ṣalāḥ-a-d-Dīn a-ṣ-Ṣafādī lived from 1296 to 1363; some Arabian scholars told me in verbal communications that this epistle may be falsely attributed to him; they did not produce, however, any proof for the latter, and I continue for the time being (until further information is retrieved on this epistle) to use the name of Ṣafādī as the author of the *Epistle in the science of music*, albeit between square brackets in order to show that there may be an issue with the authorship. Detailed explanations about the two treatises cited can be found in [Beyhom, 2014] (forthcoming).

<sup>33</sup> [Caron and Safvate, 1997, p. 26].

<sup>34</sup> May they be “one-tone” or “three-quartertones” intervals.

<sup>35</sup> Let us note here that a certain Ibrāhīm Mustafā seems to have developed a similar division of the octave, or argued about it, as writes Ghrab [2005, p. 71]: “Meanwhile, we have to notice the work of Ibrāhīm [sic] Bey Mustafā [sic], [...] who contends that all *burdāt* [the main intervals of the heptatonic scale] are divided into four parts to get 28 intervals by octave.” Ghrab cites as a reference for this author “the article of Ibrāhīm [sic] Bey Mustafa, *La valeur des intervalles dans la musique arabe* [Value of intervals in the Arabic music], Bulletin de l’Institut Egyptien, II, 1888”. We could not find this article, but it would have surely been an interesting addition to the Egyptian point of view on Shihāb-a-d-Din’s division of the octave.

<sup>36</sup> In Erlanger’s descriptions of the Arabian general scale, transliterations of the names differ from ours and from other authors’ transliterations: this is a complicated matter as each European nation as well as various authors have used their own transliteration. Attempts have been made to unify the transliterations of Arabian terms, and two main systems co-exist today, one of which used in the *Encyclopedia of Islam* while the other is used in the *New Grove*. I explain in my first volume on Arabian music (please see also note No. 19) the reasons why I think these transliterations should be adapted to fit more closely the pronunciation rather than the lettering of the Arabic terms.

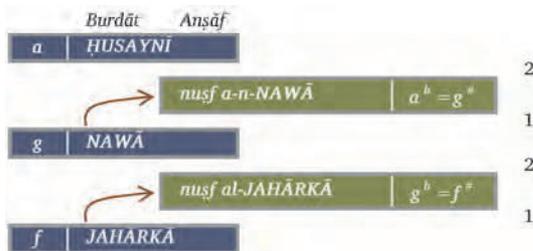
<sup>37</sup> [Erlanger, 1949, v. 5, p. 13 – Fig. 3]: reproduced by kind permission of the publisher.

<sup>38</sup> For more details on this phenomenon see [Beyhom, 2014] (forthcoming).

<sup>39</sup> See [Beyhom, 2001 ; 2003b ; 2006a ; 2007c] for more details.

<sup>40</sup> See [Beyhom, 2005 ; 2006a ; 2006b ; 2007a ; 2007b ; 2007c ; 2010c].

<sup>41</sup> A few clues to this scale are given in [Beyhom, 2005], notably in the sections concerning figures 3.15 and 3.17 [p. 84 and 88], and figures 3.21 to 3.23. Figure 3.15 explains, notably, how the tuning of the *ūd* in fourths have probably affected the scale (or reciprocally), and how the one-tone-and-a-half intervals resulting from this tuning were probably divided in two equal parts (of the string or of the interval?) which led in turn to the *zalzalian* general scale. The resulting scale deduced from the *A-sh-Shajara* treatise is shown on Figure 3.17 [Beyhom, 2005, p. 88]. The base for this scale is proposed in the figure below.

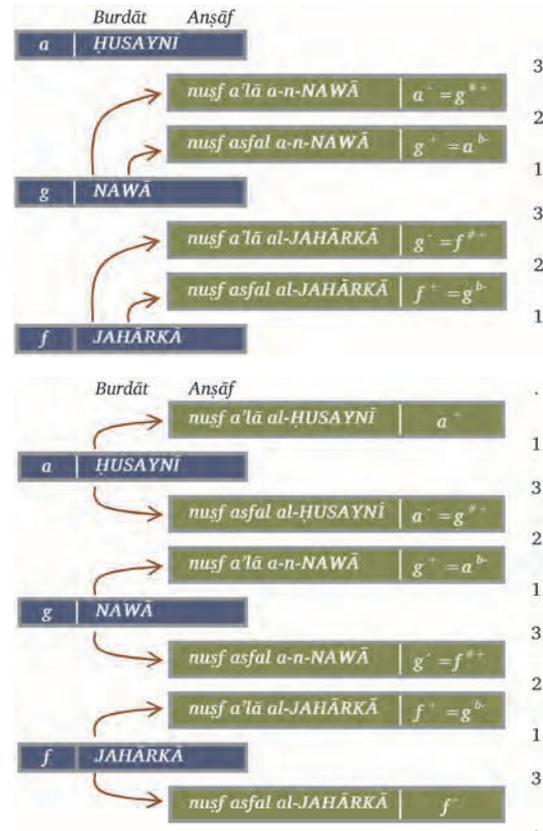


The most probable position of the *nusf* of a *burda* (degree of the Basic scale) is the upper one (this seems the case for all the “halves” cited in the *A-sh-Shajara* treatise, independently from the movement of the intervals, i.e. ascending or descending). Please note that *burda* (pl. *burdāt*) = “degree” or “interval”; *nusf* (pl. *anṣāf*) = “half”; *muṭlaq* = “free”; *muqayyad* = “tied”; *a'lā* = “higher, [a'lā min] higher than”; *asfal* = “low, lower, [asfal min] lower than”.

<sup>42</sup> Written probably around the 14<sup>th</sup> century or later (probably not later than the 17<sup>th</sup> century – see [Beyhom, 2014], forthcoming).

<sup>43</sup> For this and all details concerning the *A-sh-Shajara* and the (a-ṣ-) Ṣafādī epistle, please consult [Beyhom, 2014] (forthcoming).

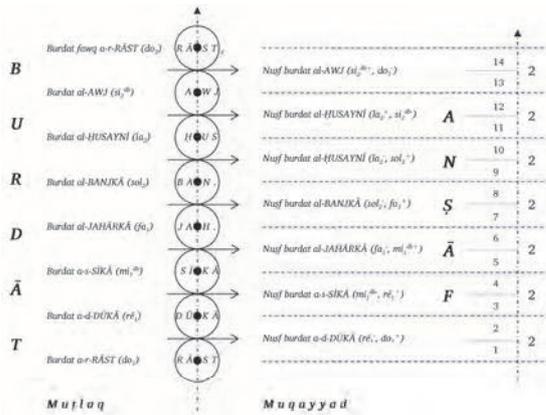
<sup>44</sup> Other representations of the scale, mainly in the (a-ṣ-) Ṣafādī epistle, are possible and are shown explicitly in [Beyhom, 2014] (forthcoming). Two possible explanations of the “upper” and “lower” positioning of the *anṣāf* are provided on the figures below.



<sup>45</sup> The anonymous author uses expressions like (here for example for the mode *Zinkulā* [Anonyme, 1983, p. 56] – please note that *Zinkulā* {for the mode} is another transcription of *ZĪNKŪLĀ* {the degree of the scale}): “ [then] you ascend [from the *JAHĀRKĀ*] to the half of the *burda* of the *BANJKĀ*”, or “تصعد إلى نصف بردة البنجكاد”. The following figure (below – which is an excerpt of [Beyhom, 2014], forthcoming) shows a possible conceptualisation of the *A-sh-Shajara* scale following diverse indications given in the treatise (including the numerous *formulae* in the treatise describing the “modes”). The main degrees (the *burdāt* on the left, also called *muṭlaqāt*) are seven with each a corresponding *nusf* (“half”) to the right (the *anṣāf* are also called *muqayyadāt*); the total number of successive intervals between the *burdāt* and the *anṣāf* is 14. The main degrees of the scale are (ascending) *RĀST* → *DŪKĀ* → *SĪKĀ* → *JAHĀRKĀ* → *BANJKĀ* → *ḤUSAYNĪ* → *MAQLŪB* [I use “*AWJ*” – the common modern name – instead in the figure] → *Fawq A-r-RĀST*. The circles shown on the figure are a possible interpretation of the phrase “the characteristics of the *muqayyada* and the *muṭlaqa* are that for the *muṭlaqa* the line going through the centre of the eyes arrives at the centre of the circle, and that for the *muqayyada* the said line arrives on the periphery”:

[...] وعلامات المقيدة والمطلقة، في أصول الشجرة وفروعها، أن المطلقة يكون الخط المار بمراكز واصلاً إلى مراكز الدائرة، والمقيدة يكون الخط المذكور واصلاً إلى محيطها [...]»، –

in [Anonyme, 1983, p. 36].



46 This problematic was clarified in [Beyhom, 2007a; 2007e; 2010b]; a detailed discussion of the scales resulting from this interpretation are to be found in [Beyhom, 2014], forthcoming (see also endnote No. 47). The following are two excerpts giving an example of differentiation between upper and lower *nusf* (singular of *anṣaf*):

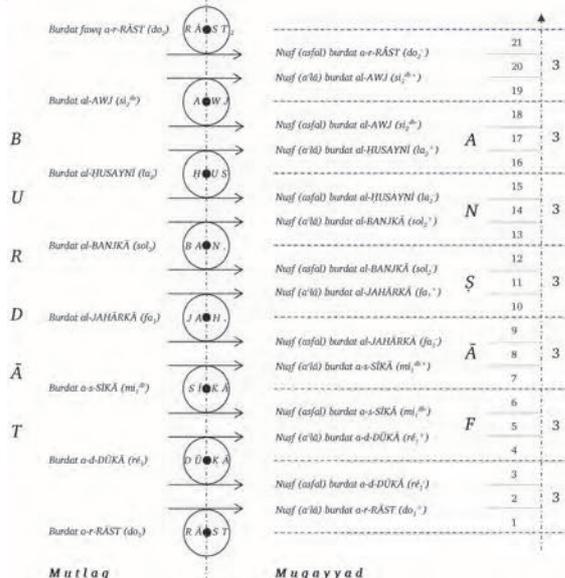
”من النجاءه هابطاً إلى نصف برده الجهاركاه، ثم إلى السيكاه ثم الدوكاه وتمد فيه مداً، ثم تُسقط برده السيكاه وتصعد دفعة إلى النصف الأعلى من الجهاركاه.”

Concerning the mode *H[ajumāyūr*: “[from the *BANJKĀ*] descending to the half of the *burda* of the *JAHĀRKĀ*, then to the *SĪKĀ* then to the *DŪKĀ* and you rest on [it], then you avoid the *SĪKĀ* and you go up in one movement the upper half of the *burda* of the *JAHĀRKĀ*” – [[Ṣafādī (a-ṣ)], 1991, p. 152].

”تهبط [من النجاءه] إلى النصف الأسفل من برده الجهاركاه.”

Concerning the mode *Nūrīz-Arab*: “descend [from the *BANJKĀ*] to the lower half of the *burda* of the *JAHĀRKĀ*” – [[Ṣafādī (a-ṣ)], 1991, p. 153].

47 This division (below) is effectively one of the solutions for the explanations of the (a-ṣ) Ṣafādī epistle on the composition of the modes – cf. [Beyhom, 2005; 2007a; 2007e; 2010b; 2014 – forthcoming] and the figure below (which is also an excerpt from [Beyhom, 2014], forthcoming).



48 Most notably (al-) Fārābī and (ibn) Sinā – please see [Beyhom, 2010c] for more details.

49 For other details on the scale construction of the Arabs from the 9<sup>th</sup> to the 13<sup>th</sup> century please see [Beyhom, 2010c].

50 To which a “disjunctive one-tone” interval is added in order to complete the octave. The «one-tone» interval was added in all possible three positions, before, between or after the two tetrachords.

51 The tetrachords are considered to be based on open strings, as with *Ramaḷ-Māya* (↑3 3 4 3 3 4 4 in standard Modern quantification in quartertones) or *Hijāzayn* (or *Hijāz-Gharīb* – ↑2 6 2 2 6 2 4) in Arabian music – see for example [Beyhom, 2003c, p. 56] and [Beyhom, 2010b, p. 34].

52 Most notably in [Beyhom, 2010c].

53 Other *maqāmāt* using this scale can be found in [Beyhom, 2003c, p. 57 – see hypersystem 4334334], of which an excerpt corresponding to the ↑4 3 3 4 3 3 4 scale is proposed below.

Yikā EL- BASKIO BASI J3, Dhil(M) M19 Ishāhūn Esir. (Dikashidā E47-*)	SOL:	I: (0,19,5,7,4334343) +4262 on 4352
Nayrūz JS M39. (Irāq-Algerie M39). Nayrūz-Rāst E297- Ishāhūn(2) A10 H63, Muhayar- Irāq Esir M35 M39 Sultān- Irāq E68(- → (0,19,4,7,4334334)	DO: RÉ:	

54 Also by Ṣafīyī-a-d-Dīn al-Urmawī in his *Risāla a-sh-Sharāfiyya fi-n-Nisab a-t-Taḥfiyya* – cf. [Beyhom, 2007a; 2007e; 2010a; 2010b; 2014].

55 I follow here Owen Wright’s usage of the term *zalzalian*: “We shall term all species and scales containing neutral intervals *Zalzalian*, whether or not the *wuṣṭā Zalzal* itself would have been used to produce them” – in [Wright, 1978, v. 28, p. 82, note No. 4]. The establishment of the *zalzalian wuṣṭā* on the neck of the *ūd* is explained for example in [Wright, 1978, v. 28, p. 31–32].

56 For example the division of half the string’s length in 24 quarters that Mashāqa attributes to Sheikh *al-ʿAṭṭār* in Damascus (see also note No. 17 on Mashāqa above). This constitutes yet another riddle for which I give clues in [Beyhom, 2014].

57 See [Hassan et al., 2007], [Farmer and Chabrier, 2000] and, for a detailed discussion on the *ṭunbūr* and the *ūd*, Appendix A in [Beyhom, 2010c].

58 In what concerns the teaching and practice, please see note No. 60.

59 “The [*nashʿat-kār*] is a half-size Turkish *ūd* with guitar pegs and six courses, used to be played mainly by amateurs; like other relics of Turkish influence, it has almost disappeared” – in [Hassan, 2001].

60 [Chrysanthos (de Madytos) and Pelopidēs, 1832, p. 28]. The title states: “The diatonic scale on the diapason system, on which the beginners are taught the quantity of melody” (in [Chrysanthos (de Madytos) and Rōmanou, 1973, p. 24]). Chrysanthos explains: “Among the melodic instruments the one that appears easier for teaching and the one found to be the most clarifying for the learning of the tones, the semi tones and, simply, of all the intervals, is the *pandouris*. This is also called *pandoura* and *pandouros* and, by us, *tamboura* or *tambour*. It has two parts, the body and the neck. On the neck the tones and semitones can be fretted” – in [Chrysanthos (de Madytos) and Rōmanou, 1973, p. 17, note No. 2]. Rōmanou (the translator and editor of Chrysanthos’ treatise on Byzantine music *Theōrētikōn mega tēs mousikēs*) further comments [Chrysanthos (de Madytos) and Rōmanou, 1973, p. 267]: “These names—in addition to *tambouras* and *tambourin*—designated in Byzantine and post-Byzantine periods the instrument known today as ‘bouzouki’. (In Crete the name *tamboura* is still in use today.) The instrument has three pairs of strings at the intervals of a perfect fifth and a perfect fourth and is played with a plectrum. Its size varies from 0,70 m. to 1,00 m”.

61 There is no evidence that Shihāb-a-d-Dīn worked with an instrument tuned with two strings a fifth apart, and we can not be sure

that such an instrument was used by him for his theoretical and practical researches on music (if any); we know however that these instruments were contemporary to the author and that other theoreticians of the same period, such as Chrysanthos (for Byzantine Chant) and Mashāqa (for Arabian music) explained their theories with the help of the *turbūr*. It would be most probable, anyhow, that a theoretician would use a lute-type instrument (with stoppable strings) for the establishment of his theory rather than his voice which would be to the least hesitant for the establishment of the degrees of the scale, especially for the intermediate notes between the main degrees; hints exist in the specialised Arabian literature concerning the use of instruments (in the following citation most probably a lute-type string instrument) for a better location of the degrees of the scale, like this one in [Anonyme, 1983, p. 37]:

”وأعلم أيضاً أن تلك النصف البُرْدَة التي نَبَهْنَا عليها هي نصف نغمة ومنها إلى نصف أخرى نغمة كاملة، ثم إلى نصف أخرى نغمة كاملة ثالثة، وهكذا إلى جوابها، وإدراك ذلك بالحلّق صعبٌ جدًّا وبالآلة يُعرف حقيقة قولنا هذا، لأنّه بالآلة يمكن ظهيرة نغمتين وثلاثة بين بعدين، لكن متنافرات“.

“And know also that the *nusf al-burdā* [« half of the interval »] we already cite is half of a *naḡma* [« melodic sound, note, degree, interval »] and from it to another half [you get] a complete *naḡma* [you get to the next degree of the scale] then to the half of another a [then a] complete [second then] third *naḡma*, and so on until the octave, [knowing that] it is difficult to perceive this with the voice [only] which makes it possible to know the truth of our present saying only through the use of [musical] instruments, because we can produce [with it] two or three notes between two distances, but they would be dissonant”.

Beyond the difficulty of properly translating this passage, this is also a hint on the possible recourse to a division of the main intervals of the scale in three parts, as in the (a-ṣ) Ṣafādī treatise.

<sup>62</sup> The *Rāst* scale with interval values (ascending) ↑4 3 3 4 4 3 3 would be found starting logically on *c*. Following this reasoning, the common Basic scale of the Arabs, as given in Figure 14, would then be a *Ḥusaynī*-type scale ↑3 3 4 4 3 3 4 (traditionally based on *D*) based on *A*.

<sup>63</sup> See [Beyhom, 2010a, p. 177 – Fig. 5] and the next sections devoted to the *śruti* scale.

<sup>64</sup> The *G* string is today often tuned in *F* in order to obtain a double octave from *F* on the first string till *f* on the sixth string.

<sup>65</sup> Please note that both scales deduced from the *A-sh-Shajara* treatise and from the (a-ṣ) Ṣafādī epistle may also be conceptualized as equal divisions of the string: a detailed treatment of this problematic is planned (as already mentioned) in [Beyhom, 2014] (forthcoming).

<sup>66</sup> This instrument belongs to Saad Saab (Lebanon), who took the pictures for this and the next figure.

<sup>67</sup> [Mashāqa, 1899a, plate inserted between p. 1076 & p. 1077].

<sup>68</sup> Adapted from [Beyhom, 2010c, v. 1, p. 99 – Fig. 40]: this figure represents a stylised finger board of a common *ūd*; the vertical grid with fine blue lines shows the (approximate) positions of exact quarters of the tempered tone. The first *mujannab* (commonly known as “neutral tone” in Western specialised literature) resulting from this division (to the right) measures approx. 151 cents, and the second *mujannab* approx. 165 cents; “hf” stands for “half-flat” and “+” for “one comma plus” (with the “comma” approximately equal to 24 cents) alteration. The “minor tone” between the *binṣir* (“ring finger” or “annular”) and the *khinṣir* finger (“little finger” or “auricular”) positions measures 182 cents; the “major tones” in this construct lie between the perfect fourth and fifth. The fifth lower string was as a rule hypothetical; its first known appearance in practice is mentioned in the 11<sup>th</sup> century by (ibn a-ṭ) Ṭahhān al-Mūsīqī (see the edition by

Neubauer [Ṭahhān (ibn a-ṭ ~ al-Mūsīqī), 1990, p. 177, f<sup>o</sup> 90r] or our transcription in [Beyhom, 2010c, v. 1, p. 504]):

”ولمّا الأوتار فمصلها أربعة وشدّ بعض المتقدمين وترًا خامسًا سمّاه الزير الحذّ“

(“Concerning the strings: their number is originally four but some of the moderns tie a fifth string which they call the *zīr al-hād*”).

The Western notation of the resulting degrees of the scale (we use mainly the Arabian solmisation) is based on the Pythagorean interval basis, which shows the difficulties for the use of such a notation on the *binṣir* or *wustā* line: in the Pythagorean system, flats and sharps lower or raise a note with the *apotome* (roughly equal to one *limma* + one *comma*, or 90c. + 24 c. = 114 c.). In the case of *B<sup>#</sup>*, *e<sup>#</sup>*, *a<sup>#</sup>* and *d<sup>#</sup>* (and the hypothetical *g<sup>#</sup>*) on the figure, a more “traditional” Western notation would have been *c* (or *c<sup>+</sup>*), *f<sup>b</sup>*, *b<sup>b</sup>* and *e<sup>b</sup>*; however, if the corresponding pitches *c*, *f*, *b* and *e* were to be placed (logically) at 408 cents from the nut (with a Pythagorean ratio of 64/81), *c*, *f<sup>b</sup>*, *b<sup>b</sup>* and *e<sup>b</sup>* would correspond to their unaltered counterparts minus one *apotome*, (roughly) 408 – 114 = 294 c. This is however not the case, and the *B<sup>#</sup>*, *e<sup>#</sup>*, *a<sup>#</sup>* and *d<sup>#</sup>* notations reflect more faithfully the reality of the positioning, as adding an *apotome* to the *B*, *e*, *a* and *d* pitches from the Pythagorean position at 204 cents (with an 8/9 ratio) would give an interval of 204 + 114 = 318 c. (to the cent) which is much closer to the 316 c. value corresponding to the ratio 5/6. Please note that I have also avoided using “Just Intonations” notations in the figure as this would have been introducing a bias upon Arabian music, notwithstanding the fact that this would be anachronistic.

<sup>69</sup> The upper string’s perfect fifth interval (from the nut) is divided into 16 equal parts (“quarters”) and the second’s string perfect fourth interval (also from the nut) is divided into 12 equal parts. This is equivalent to the division of the octave in 28 “quarters”, or equal parts of the string and quarters of the intervals between the 12 equal parts division, which gives as a result the main degrees of the Arabian scale.

<sup>70</sup> [Jairazbhoy, 1975, p. 44].

<sup>71</sup> Available in languages that I could read.

<sup>72</sup> Like many other musicians or scholars, my first reaction to the *śruti* system was to consider them as equal intervals: “It has been necessary to clarify the connection between the seven *svaras* and Bharata’s two series of *śrutis* values before proceeding to the examination of the nature of the *śrutis* themselves. Since Bharata distinguished twenty-two *śrutis* within one octave, it seemed self-evident that one *śruti* was equal to one twenty-second of an octave; this would mean that the octave was divided into twenty-two equal parts. This was the generally accepted conception until the beginning of the 20<sup>th</sup> century.” – in [Kolinski, 1961, p. 4].

<sup>73</sup> I present in [Beyhom, 2014] (forthcoming) a few propositions for a better understanding of the latter theories.

<sup>74</sup> Mainly his article on Indian music [Coomaraswamy, 1917].

<sup>75</sup> More precisely, for the latter, his article on the 22-*śruti* scale [Jairazbhoy, 1975] as his book [Jairazbhoy, 1971] deals mainly with “modern” Indian music.

<sup>76</sup> And to the least beginning with the *śruti* scale found in Bharata-muni’s treatise on music, as I further explain in the text.

<sup>77</sup> A particularity of the Arabic language is that it has two different plurals: the dual, and the plural proper; two *mujannab*(s) should be termed *mujannab<sup>du</sup>*, whenever more *mujannab*(s) (or *mujannabs*) would be transcribed *mujannabāt*: as transcription of the Arabic language is already a complicated matter, we use the undifferentiated *mujannab*(s) for ease of understanding for the reader.

<sup>78</sup> The range of thank expands far beyond these few authors, but it would be too long to list them all here; please note also that a comprehensive and maybe helpful review on Indian music theories and their evolution can be found in [Powers and Widdess, 2001].

<sup>79</sup> Alain Daniélou was the champion of such explanations, notably in [Daniélou, 1968], in which he uses [see for example p. 32-36] Pythagorean ratios to explain his “66-*śrutis* scale”; the 66-*śrutis* scale is also (and already) present in [Daniélou, 1949, p. 50-56], not to mention [Daniélou, 1943] and [Daniélou, 1959] in which Pythagoreanism is omnipresent; A. H. Fox Strangways openly acknowledges in [Strangways, 1908, p. 30] that his “article seeks to establish some underlying principles for Hindu *rāga*, to trace the connection between the early music of Greece and of India”, and deploys considerable efforts in his book on “Hindustani music” in order to express the sizes of the intervals in the scale in Pythagorean-like ratios. Despite his frequent references to Aristoxenus (see for example [Strangways, 1908, p. 464] and [1914, p. 103, 114, 125, 156 etc.]), the author’s scale in his table [Strangways, 1965, p. 117 of the lithographic reprint of the 1914 edition] contains three different *śrutis* the sizes of which 22, 70 and 90 cents; the final construct carefully avoids any “neutral” tones in the scale. However, “[t]he crucial question [...] is whether the system as a whole is based on the cyclic or on the divisive principle, to use the terms suggested by Sachs,” (as put in [Kolinski, 1961, p. 4]), knowing that “[t]he divisive hypothesis assumes that 7 *śrutis* represented the major third 4:5 or 8:10, and that this interval has been divided into the major whole tone 8:9 of 4 *śrutis* and the minor whole tone 9:10 of 3 *śrutis*.” – in [Kolinski, 1961, p. 5].

<sup>80</sup> “The number of the *Śrutis* in the *Ṣaḍja Grāma* are as follows: three in *Rṣabha* (*rī*), two in *Gāndhāra* (*ga*), four in *Madhyama* (*ma*), four in *Pañcama* (*pa*), three in *Dhaivata* (*dha*), two in the *Niṣāda* (*nī*) and four in the *Ṣaḍja* (*sa*)” – [Bharata, 1961, v. 1581, p. 6 (XXVIII.25.26 & XXVIII.27.28)]: this scale corresponds to †3 2 4 4 3 2 4 (in *śrutis*), a perfect conceptual match for the scale of *maqām Ḥusaynī* (ascending †3 3 4 4 3 3 4 in quartertones, with a *bayātī* + *rāst* ascending tetrachordal structure – or *bayātī* †3 3 4 + disjunctive tone 4 + *bayātī* †3 3 4) in Arabian music. By beginning on *sa* instead of *rī*, we obtain the †4 3 2 4 4 3 2 (in *śrutis*) scale. The author further states (same page) that the structure of the *Madhyama Grāma* is as follows: †4 3 4 2 4 3 2 (in *śrutis* and beginning with *ma*), which is a perfect conceptual match for the scale of *maqām Rāsd-a-dh-Dhīl* as shown in the figure below (taken from [Beyhom, 2003b, p. 56]), and for a few others *maqām*(s) (different names in different *maqām* regions).



<sup>81</sup> i.e. a scale using the so-called “neutral tones”: the word “*zalzalian*” originates in the name of Maṅṣūr Zalzal, an 8<sup>th</sup> to 9<sup>th</sup> century *ūd* player at the *Abbāsīd* court of Baghdad, reputed to be the first to use positions for “neutral thirds” on the fingerboard (see for example [Farmer, 2001]). The question whether “*zalzalism*” (or “*zalzality*”) originated with this musician remains however highly controversial.

<sup>82</sup> In his book *The modal system of Arab and Persian music: A.D. 1250-1300* Wright explains how the Pythagorean positionings of the pitches in Urmawī’s theory are to be considered *zalzalian*, i.e. based on intervals approximately equal to the 3-quarter or 5-quarter tones used in Modern Arabian theories of the scale. Ṣafīyy-a-d-Dīn al-Urmawī even formulated in his second epistle on music (the *Risāla a-sh-Sharāfiyya* – see [Urmawī (al-), 1982; 1938]) an explicit *zalzalian* third (which he calls “Persian” for reasons explicited in [Wright, 1978] and that I further explain in [Beyhom, 2010b] and in [Beyhom, 2014] – forthcoming) with the ratio 59/72 corresponding to 345 c. and an explicit *zalzalian* second with the ratio 59/64 corresponding to 141 c., as I have already reminded in a number of papers ([Beyhom, 2006a; 2007a; 2007e]). Both these *zalzalian* third and second are found on the neck by halving the string length corresponding to other intervals

obtained through a Pythagorean construct, which shows that the equal division of the string is one of the ways used by the Arabs in order to include *zalzalian* intervals in a scale (see for example [Urmawī (al-) and Jurjānī (al-), 2001, v. 3, p. 110-120], with also useful information on the undifferentiated use of the *mujannabāt* for describing the tetrachords of Arabian music by Urmawī). I have also explained (in [Beyhom, 2010a]) how Ṣafīyy-a-d-Dīn’s “Pythagorean” theory is, basically, an attempt to force *zalzalian* intervals in a Pythagorean costume – more details on Urmawī’s *zalzalian* conception of the scale are to be found in [Beyhom, 2014] (forthcoming).

<sup>83</sup> For example, a 3 *śrutis* interval is always greater than a 2 *śrutis* interval in the course of, for example once again, one same melodic phrase. Proportionality is the rule, but the exact measures of the intervals may (and do) vary.

<sup>84</sup> “The *Vīnā* is tuned thus; the two lowest strings at the distance of a Fifth, the rest in Fourths. It has at present four fretted strings on the fingerboard and three unfretted at the side played as a drone by the (armed) little finger of the right hand.” – in [Strangways, 1908, p. 454], and: “There is little doubt that the consonance of fourths and fifths was of fundamental importance in ancient Indian music” – in [Jairazbhoy, 1975, p. 42].

<sup>85</sup> (Ref. 6; p. 114) Here, Kolinski refers to [Strangways, 1914, p. 114]: “It appears from the table of *mūrcharas* that all the twenty-two *śrutis* except the first and twenty-first are accounted for. These two are inserted, by analogy, in the next diagram in square brackets as consonant notes from the eighth and tenth *śrutis* respectively.”

<sup>86</sup> Here, Kolinski refers to [Daniélou, 1943, p. 121-122], in which the latter notably states (p. 122): “If we exclude from this series G+ (Pa+) (Abb), the fifth being invariable, we obtain a scale of twenty-two sounds, the *śrutis*”; Daniélou further compares [1943, p. 122-123] the 22-*śrutis* system to the “Arabian” and “Ancient Greek” scales: “This scale is identical to the one given by Arab mathematicians as having been that of the ancient Greeks, and it still remains the division used by the Arabs themselves. The major tone is thus divided into minor tone, apotome (or major half-tone) and limma”; this shows that Daniélou can hardly be considered as a supporter of the “divisive” theory, but should rather be considered as a promoter of the Pythagorean (“cyclic”) system applied to the Indian scale.

<sup>87</sup> Kolinski refers here to [Clements, 1913, p. 101], in which the author concludes: “The fallacy underlying the theory of the equality of the *śrutis* is demonstrated by the numbers given. They are calculated on the basis that a one-*śruti* interval is 22 cents, two *śrutis* 112, three *śrutis* 182, and four *śrutis* 204. The 3 *śrutis* interval of the *Gandhara Grama* is 134 as explained in the text. It will be seen that the ancient system required 25 *śrutis*, and not 22, three of them being confounded with their neighbors”.

<sup>88</sup> [Kolinski, 1961, p. 5]; Powers, in his review of Kolinski’s article [1962], strongly criticises some major points of his reasoning and confirms ([Powers, 1962, p. 223]) that “Mr. Kolinski’s basic premise is that the system of 22 *śrutis* must somehow or other be connected with the ‘cyclic’ method of tuning by fifths, rather than with the ‘divisive’ method based on just intonation”. Please note that the only systematic homogenization of the transliteration of Indian musical terms (throughout the numerous citations in the article) was applied to the word *śruti*. Most of the other transliterations were left unchanged in order to reflect the time, but also the place of transliteration.

<sup>89</sup> [Coomaraswamy, 1917, p. 165].

<sup>90</sup> [Kolinski, 1961, p. 4-5].

<sup>91</sup> “[S]ince each of the twenty-two *śrutis* has its proper name, one should infer that each of these twenty-two names has its distinctive meaning. Does this, then, involve the assumption of a basic division of the octave into twenty-two tones? By no means. Both the general tonal

structure of Indian music and the nature of the quintal principle from which, as we saw, the 22-*śruti* complex must have originated converge into the concept of a system of twelve tones within the octave, that is, a collective chromatic scale into which all heptatonic and other Indian scales and modes may be projected if differentiations in intonation of secondary structural importance are not taken into account” – in [Kolinski, 1961, p. 6].

<sup>92</sup> [Coomaraswamy, 1930].

<sup>93</sup> As Jairazbhoy [Jairazbhoy, 1975, p. 54 – note n° 12] puts it: “Coomaraswamy (referring to [Coomaraswamy, 1930]), has argued, on the strength of textual descriptions, that the ancient Indian *vinā* was a bow harp. This seems to be corroborated by early Indian bas-reliefs. Bake (referring to [Bake, 1957]) has, on the other hand, argued with some justification that Bharata’s experiment only makes musical sense on a stopped stringed instrument”. Another corollary assumption is that the *śruti* is not necessarily an equal size interval over the octave, as Popley [1921, p. 26] puts it: “The *śruti* or microtonal interval is a division of the semitone, but not necessarily an equal division” (although I do not really understand why the *śruti* should divide the semitone, and not the tone or the fourth as two other possible examples) – see also [Dick, Widdess, and Geekie, 2001], notably: “In South Asia, short-necked lutes first appear in the Graeco-Buddhist art of the 1<sup>st</sup> to 3<sup>rd</sup> centuries C.E. of Gandhāra. They appear in Buddhist art from the 2<sup>nd</sup> to 6<sup>th</sup> centuries C.E., and thereafter sporadically in Hindu art to the end of the millennium. They generally occur in the same contexts as harps”. Let us note that the equality of the *śrutis* may also have been a hypothesis of Indian musicologists and researchers or musicians: “Um die europäischen Forscher mit der genauen Intervallgröße der *Śrutis* bekannt zu machen, sandte Tagore 1886 an Ellis eine *Vīṇā*, auf der die vollständige 22-stufige Leiter durch feste Bünde fixiert war. Die Teilung der Oktave war in der Weise vorgenommen, daß die Saitenlänge in zwei Hälften, die so entstehende untere Quarte in 9, die obere Quinte in 13 gleiche Teile zerlegt wurde. Ellis bestimmte die den Bünden der ‘*Śruti-Vīṇā*’ entsprechenden Tonhöhen und berechnete, vom Grundton aus folgende Werte in Cents (Hundertstel des temperierten Halbtons): 0 45 111 169 222 267 316 389 436 505 534 583 640 712 [...] 749 807 855 917 954 1013 1077 1136 1220 [...] Ellis vermutet, daß eine 22-stufige temperierte Leiter intendiert war” – in [Abraham and Hornbostel, 1904, p. 382].

<sup>94</sup> To whom I am indebted for most of my practical knowledge on Middle-Eastern Arabian music today.

<sup>95</sup> The different kinds of instruments, with different tunings.

<sup>96</sup> In traditional non-standardised instrument making, the “same” two instruments can have differences, albeit sometimes small, in tunings, measurements etc.

<sup>97</sup> On the fingerboard of a *ūd*, for example, thicker finger tips or smaller hands (or longer fingers) can change the way in which the musician performs, thus inserting additional (sometimes very small) discrepancies of intonation between the intervals used by two different musicians; such differences of intonation remain whatever the musical practice is, as long as the instruments themselves are not completely standardised and equally tempered. This, and other factors which contribute in introducing differences of intonation and heterophony into modal music are discussed in some of my writings, including [Beyhom, 2001; 2003a; 2003b; 2003d; 2004; 2007c; 2008; 2010a], and especially [Beyhom, 2007d].

<sup>98</sup> Or for its transposed equivalents.

<sup>99</sup> This is common knowledge for any educated musician or teacher (of Arabian traditional music) in the Middle-East.

<sup>100</sup> The term “natural” should be considered with considerable caution here: this expression is, to the least in this article and in my other

writings, used in a mere conventional way in order to indicate that the degree *e* conforms to the usual unaltered *e* in the Western scale.

<sup>101</sup> (Reminder): Plural of *mujannab*, a term used in Ancient Arabian manuscripts to define the position of the finger, on the fingerboard of the *ūd*, for what was to be called “neutral tones” (i.e. tones that are neither “major” nor “minor” in Western music standard theory) by Western musicologists.

<sup>102</sup> In the *Kitāb al-Adwār* – see one of the references [Urmawī (al-), 1980; 1984; 1986; 1938; 2001], and [Beyhom, 2010a].

<sup>103</sup> Information about performance practice in Urmawī’s writings is very scarce: all details on this subject are to be found in Owen Wright’s magisterial book on the Systematists [Wright, 1978].

<sup>104</sup> More detailed information about Urmawī’s use of the *mujannabāt* is to be found in [Beyhom, 2010a], and in [Beyhom, 2014] (forthcoming).

<sup>105</sup> This is the replica of Figure 5 in [Beyhom, 2010a].

<sup>106</sup> [Urmawī (al-), 2001, p. 6].

<sup>107</sup> Please note that in Urmawī’s theory two consecutive *mujannab(s)* are never equal and have the form (L C + L L) or (L L + L C), the total of which is a “minor” third equal to one tone plus one *limma* (or 3L + C, as the tone value is L L C, or two *limmata* plus one *comma*, in combination). The reader may find detailed explanations on the different type of intervals used in Arabian music theories beginning with the 9<sup>th</sup> century and on the way they are used in these theories, especially in Urmawī’s *Book of cycles*.

<sup>108</sup> For Ancient Arabian music theories, see [Beyhom, 2010c]; for modern performance, this is a reality of today’s teaching and of yesterday’s (the turn of the 19<sup>th</sup> to the 20<sup>th</sup> century) music on old records (see [Beyhom, 2014], forthcoming).

<sup>109</sup> Indian music specialists compare sometimes the “3 *śrutis*” interval to a “small”, or “minor,” tone, and the “2 *śrutis*” one to a “semitone” – see for example [Popley, 1921, p. 31], or [Bake, 1957, p. 61]: “Indian music recognizes two, three, and four-*śruti* tones which roughly correspond with our semi, minor, and major tones”. The same author asserts: “As it was quite clear, even after the first attempt to translate Bharata’s extremely concise text, that this *pramāṇa-śruti* was an interval equal to the difference between a major and a minor tone, investigators accustomed to the mathematical approach of the Greeks to their music, at once applied Greek standards to determine the measurement of the standard *śruti* (*comma* of Didymus) and from those premises began detailed calculations as to the exact measurement of the 22 *śrutis* which find a place within the compass of the Indian octave” – [Bake, 1957, *ibid.*].

<sup>110</sup> [Kolinski, 1961, p. 3].

<sup>111</sup> See [Beyhom, 2010c, *Appendix A*].

<sup>112</sup> To the least in Arabian music, contemporary and Ancient: the (somewhat successful) attempts to depict ancient *ūd(s)* as “fretted” are mere attempts to impose a fixed temperament (often based on a Pythagorean division of the octave) to Ancient Arabian music – see [Beyhom, 2010c, *Appendix A*] and [Beyhom and Makhlouf, 2009], as well as [Beyhom, 2011].

<sup>113</sup> Especially when these positions are determined by complex ratios such as the ones used for the Pythagorean *limma* and *comma*, for example.

<sup>114</sup> This is an exact copy from [Subramanian, 1985, p. 12 – Fig. 8] previously used for the exposé on the origins of the *ūd* in [Beyhom, 2010c, v. 1, p. 304 – Fig. 105].

<sup>115</sup> From [Marcel-Dubois, 1937, Fig. i]: by kind permission of Rosy Azar Beyhom who made the line drawing.

<sup>116</sup> Please note that there is no origin issue here as the Ancient Indian treatises predate with no doubt the first Islamic treatises on music, as well as the *vinā* predates (to our knowledge) the *ūd* – see for example [Jairazbhoy, 1972, p. 63]: “Musical theory in India stems from the *Nāṭyaśāstra*, ascribed to the author Bharata, which is generally dated from the second to the fifth century A.D.”. As the first extant writings on Arabian music theory are the epistles of (al-) Kindī, the *Philosopher of the Arabs* (9<sup>th</sup> century), *mujannab* is only used conveniently as an interval which is well known in Arabian music theories.

<sup>117</sup> Logarithmic computation is relatively modern though musicologists tend to forget about it. As a consequence many believe that “equality” can only be conceived in modern terms.

<sup>118</sup> These numbers are rounded to the closest integer unit. Please note that, obviously, multiplying 55 cents by 22 *śrutis* will give us a value which is not a perfect match for the octave (exactly 1217,44 if using the accurate mean value of the *śrutis* – rounded to 1217 cents to an octave, which is 17 cents surplus); this is however no issue for an Ancient theorist because the octave is still divided in 22 equal *śrutis*, the ones used to divide the perfect fourth in 9.

<sup>119</sup> “The two main theories which find support are both based on sound musicological principles. The first of these, described by Fox Strangways, derives the *śrutis* from the ‘divisive’ principle where the tones are determined on the basis of simple fractions of string length. The second, described by Kolinski, derives the *śrutis* by the ‘cyclic’ or ‘up and down’ method in which the tones are determined by perfect fourths and fifths. [...] Both theories arrive at the conclusion that the *śrutis* were of three different sizes; 22, 70 and 90 cents in the ‘divisive’ and 24, 66 and 90 cents in the ‘cyclic’. The evidence in the *Nāṭyaśāstra*, however, seems to suggest that the *śrutis* were of one constant size, or at least, that they were thought to be so.” – in [Jairazbhoy, 1975, p. 38].

<sup>120</sup> Except for transpositions to the perfect fourth, due to the nature of the tuning and of the division (the first in perfect fourth and the second dividing this interval in equal parts). This can be easily checked on Figure 20.

<sup>121</sup> It could however bear parallel marks indicating the theoretical positions of the *śrutis* division, or other small marks playing the same role on the top of it.

<sup>122</sup> As already explained above in the text.

<sup>123</sup> The octave interval is not, for example, a necessary characteristic of the *maqām* scale, as some *maqām(s)*, and specifically *maqām Šabā* of Arabian music for example, are constructed in such a way that they avoid the octave interval (in this case the ascending scale as can be seen on the figure below from [Erlanger, 1949, v. 5, p. 282 – Fig. 123], reproduced by kind permission of the publisher).



<sup>124</sup> Let's also remember that the octave is not an interval resulting from the cycle of fifths cherished by most musicologists dealing with Indian music – see [Beyhom, 2010a; 2010c, v. 1, p. 56–70].

<sup>125</sup> Jairazbhoy's explanation on this subject ([Jairazbhoy, 1975, p. 54]) is noteworthy: “The total number of *śrutis* in the octave, twenty-two, is only incidental, being determined by the size of the unit of measure”.

<sup>126</sup> In [Beyhom, 2010a] as one example.

<sup>127</sup> The same does not apply to the ratio between  $M_2$  and  $T$  expressed in cents and expressed in *śrutis*, as  $2/3$  ( $=0.67$ ) and  $3/4$  ( $0.75$ ) are nearly the same.

<sup>128</sup> In the “3 2 1 3 2 1 3” division, the fourth's value would be  $3+2+1=6$  elementary intervals (*śrutis*?), which means that the *string*'s division is on the basis of 24 division in all (the perfect fourth emplacement on the neck is at one fourth of the string and it contains 6 elementary intervals – this corresponds to a division of the string in 24 equal string-parts, and of the octave – from the nut to half of the string – in 12-equal string-parts).

<sup>129</sup> As  $(24-3)/24=21/24=7/8$ . If we were to divide the half of the string in 15 (which is the sum of the elementary intervals in the “3 2 1 3 2 1 3” division), the ratio would be based on a division of the string in 30 equal-parts (15 for the octave between the nut and the half of the string, and 15 for the other half of the string), and the ratio of the first 3 elementary intervals (the “tone”) would be  $27/30$ , or  $9/10$ . In other terms, the first result ( $7/8$ ) is based on a tuning of the strings in fourths and the subsequent division of the length of the fourths in 6 equal string-parts, whenever the second result ( $9/10$ ) is based on a division of half of the string in the 15 elementary intervals that would result as a whole from the “3 2 1 3 2 1 3” division. This is just another example of the numerous possible uses of the equal division of the string technique.

<sup>130</sup> It is much easier to get to the  $4/5$  ratio than to the  $29/36$  ratio as the calculations are much simpler (and an eventual folding of the string even simpler); if it was to be used as such in the division of the string, however, this would have changed all the overall division in equal string-parts which I think is the basis of the *śrutis* system.

<sup>131</sup> Compare this discussion with: “Perhaps a musicologist could have determined empirically that tones of three different sizes were used in Samavedic chant. Further, he may have determined that the largest tone was about double the size of the smallest and the third tone was somewhere between these two in size. Since presumably he had no way of determining the size of this intermediate tone with any accuracy, nor an objective standard of intervallic measure against which to compare it, the obvious way would be to attempt to relate it to the other tones. In practice this is virtually impossible to do by ear alone and the most convenient approximation which suggests itself is to consider it as being half-way. Thus, if the smallest tone is expressed by the numeral one, the large tone would be two and the intermediate tone one and a half. Fractions are clumsy to handle and in this case would easily be eliminated by doubling each of these numbers. This would mean that the size of the small tone is now assigned the number, two; the intermediate tone, three; and the large tone, four. These are in fact, the *śrutis* values of the tones given in the *Nāṭyaśāstra*” – [Jairazbhoy, 1975, p. 52]. Please note also that number 36 can be divided by a variety of smaller numbers like (1) 2, 3, 4, 6, 9, 12 and 16; this gives many possibilities for ratio simplifications, as we can see for example for the second, third and fourth *śrutis* on Figure 20 (with ratios  $17/18$ ,  $11/12$ ,  $8/9$ , as well as the sixth, the eighth and the ninth (with ratios  $5/6$ ,  $7/9$  and  $3/4$ ).

<sup>132</sup> As opposed to “quantitative”.

<sup>133</sup> With probably an exception in what concerns the perfect fourths and fifths; this is the case in most of the theories of modality, including *maqām* and Byzantine chant theories, as we show in [Beyhom, 2014] and [Beyhom, 2013] (forthcoming).

<sup>134</sup> For example applying to this scheme the well-known experience of the two *vinās* of Bharata Muni [Bharata, 1961, v. 1581, p. 7–9]: due to the impossibility to check by myself the original manuscripts (and language – these two conditions are, in my experience, very important because of the tendency of the commentators to interpret the manuscripts at their convenience), I simply can not know if this experience is compatible with the equal string-division of the fourth.

<sup>135</sup> It seems however that the 28-quarters division of Shihāb-a-d-Dīn is superfluous as a conceptual construct, as only 14 or 17 degrees in

the general scale have names of their own; the further division in *Safinat al-Mulk* of the 14 *arṣāf* (or halves) found in previous theories seems to be a step towards more accuracy in the determination of interval sizes or degree positions, *i.e.* supplementary intermediate positions between the degrees used for small intonations or unusual transpositions. On the other hand, the fact that almost all the degrees (or the intermediate intervals between them) of the old Indian scale are accounted for (see [Strangways, 1914, p. 114]) seems to mean that the 22-*śruti* construct is conceptual in its essence (see [Beyhom, 2010a] for more details about *conceptual* and *measuring* theories and their differentiation), or “more” conceptual.

<sup>136</sup> “Apart from the tempered instruments of modern Europe there scarcely exists an absolutely fixed scale. [...] [T]he meaning of the *śruti*

concept has to be discussed. Was it but a simple expedient to determine roughly the three different sizes of the *svaras* or did it involve an actual subdivision of the octave into twenty-two tones? The way in which Bharata utilizes the *śrutis* hints at the former interpretation” – in [Coomaraswamy, 1917, p. 165].

<sup>137</sup> Or aiming at fixing.

<sup>138</sup> The measurement of string and pipe lengths was conceivable since earliest times.

<sup>139</sup> See for example [Jairazbhoy, 2008] concerning this point.

<sup>140</sup> The *b* and *e* degrees could be here considered as *zalzalian* (and noted *b<sup>zf</sup>* and *e<sup>zf</sup>*) if not for the discrepancy between the corresponding interval and its “standardised” *zalzalian* form (on Figure 20: 350 c. from the nut).

## MODUS VIVENDI<sup>1</sup>

Richard Dumbrill\*

### Foreword

It is not possible, objectively, to define the original concept of mode since what we think it is may no longer be what it had been, and while we may satisfy ourselves with our current perception of it, a reconsideration of its origins needs to be addressed for the sake of academic probity. Every assumed exogenous and modern instance of it, is no longer the reflection of its possible historical and, or, ethnical authenticity for it has been contaminated by western dictates, for the past millennium, if not longer. And any instance of its assumed endogenous occurrence has also been corrupted in the course of the past two millennia, or more, by political, philosophical or theological<sup>2</sup> ideologies to suit whomever. Therefore, however futile may seem to be the purpose of this disquisition, it is nevertheless essential as a record of what we think might remain of it at the dawn of the twenty first century, and therefore is an academically defensible exercise.

### INTRODUCTION

Both “tone” and “mode” are inappropriate terms of imprecise meanings which are used to describe ill-defined pitches or pitch sequences, quantitatively and qualitatively. Greek and Latin dictionaries agree that “tone” stems from the Greek *τόνος*.

*Τόνοι* were modes or keys differing in pitch. The Latin “*tonus*” is the sound, tone, of an instrument, and the term is therefore slightly more accurate. But Latin “*modus*” is the measure of tones, melody, rhythm, and time<sup>3</sup>. Thus “tone” and “mode” appear substitutable. “Mode” is also anachronistic since in Early Greek contexts, but in modern argumentation, it defines something which had not yet been known, as a term, and probably not as the concept with which it is usually associated, “*a priori*”. Furthermore, it is still of common belief, even at the dawn

of the 21<sup>st</sup> century, that these terms may apply, erroneously, to all known systems<sup>4</sup>, intemporally and interculturally, *obscurum per obscurius*. This attitude may be construed either as musical neo-imperialism where all is ruled, measured, codified, notated, compared, studied and published by western scholarship, exclusively, and is strongly conditioned by Hellenocentric a prioricity<sup>5</sup> since this position finds reasonable to infer anything without any empirical evidence, infallibly, because in this case nothing can be taken as evidence against it.

There is a profusion of respectable reference volumes giving corpulent definitions which for the most obnubilate rather than enlighten. Classical metrology of musical systems is nothing but subjectivist convention and is therefore inappropriate. Additionally, Greek roots and etymology, although very convenient, tend to relate all that we qualify with them, to Ancient Greece.

Then, in the West, Roman; Mediaeval; Renaissance; Classical; Romantic and modern treatises have in the course of the centuries added to the confusion brought up by an almost universal belief in the reliability of Greek knowledge transmission. There are no Classical autographs. We have only late copies dating 1000 to 1500 years after their assumed composition, and mostly dating around the 11<sup>th</sup> century a.d. and later<sup>6</sup>, and Classical philologists may argue that on the basis of “x”, “y”, or “z”, that what we have from early to late Greek theoreticians was indeed from their own hands. However, without autographic material, I remain cautious. Mediaeval theoreticians often used the Greek medium for writing their own treatises making it difficult to distinguish their works from copies of older material. The meagre fragments of musical theory extracted from Oxyrhynchus, for instance, are hardly evidential of Aristoxenus’ work; and Suidas<sup>7</sup> 10<sup>th</sup> century Byzantine *Suda* is more of a biographical index than it is a collation of theses, and is therefore of little academic value for our purposes.<sup>8</sup>

Consequently, my attempt at defining the elusiveness of what mode may have been will be within archaeological sources of music theory, philology and iconography. The evidential material, should mode had ever been intended to be transcribed, may constitute its earliest appearance insofar as the cuneiform texts originating from the Ancient Near East are autographic, for the most, and date from about 2200 B.C., to around 600 B.C., at the dawn of Greek Orientalism, covering a period of some 1600 years of music theory<sup>9</sup>. This is a considerable period which has been researched, for the past fifty years, mainly by philologists<sup>10</sup> with no musicological background and the results are consequently, for the period under disquisition, of little scientific value.

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## THE EVIDENCE

The documentary evidence appears in the form of clay tablets written in the cuneiform system of writing. Some are written with agglutinative<sup>11</sup> non Semitic languages such as Sumerian and Hurrian, and others with Semitic languages<sup>12</sup> such as Akkadian and its development into Old, Middle and Neo-Babylonian and Old, Middle and Neo-Assyrian, for the Semitic. There are bilingual lexical texts written in Sumerian and Akkadian. These texts are invaluable for each other's elucidation. Some texts have been unearthed in context and are therefore datable with great precision but other documents, mostly having been acquired in the 19<sup>th</sup> century from various antiquarians can neither be sourced nor dated with certainty<sup>13</sup>. However, the nature of their content and sometimes their orthography may become useful for refining their identification.

The texts are of three types. Firstly there are mathematical documents which are essential in determining the counting system used for assumed pitch quantification, as the inhabitants of ancient Mesopotamia had different systems for different purposes, mainly sexagesimal (base 60) and decimal (base 10). Secondly, there is a lexical and literary texts. Thirdly we have theoretical texts and fourthly there is musical notation of songs, in Hurrian, constituting the “proof in the pudding”, as if the theory is well interpreted, then the written instructions will yield music lending itself to analysis and not amount to an aleatory succession of pitches which might have come straight from a “laundry list”.<sup>14</sup> Often, seal cylinders and other forms of iconography may contribute to the elucidation of the philological and theoretical narratives, and in relation to glyptographic contribution.

Most of the cuneiform texts we shall investigate in the present paper are autographic. Some are copies of older texts. However, scribal reliability is recognised in the Ancient Near East.<sup>15</sup> Thus we are quite confident with the quality of the transmission of the cuneiform corpus which is otherwise proven in the consistency of the terminology and its orthography often spreading through two millennia, and more, of scholarship.

## THE TEXTS:

1. Mathematical texts: *CBM* 11340 + 11402, obv. and rev.; *CBM* 11368, rev.; *CBM* 11902, obv.; *CBM* 11097, rev. These four texts were unearthed at the site of the Temple Library of Nippur in Southern Iraq, during the Babylonian Expedition of the University of Pennsylvania. Out of fifty thousand tablets found at the site, seven thousand of them were catalogued and published by Hilprecht in 1906.<sup>16</sup> More

recently, Margaux Bousquet<sup>17</sup> and Leon Crickmore<sup>18</sup> have re-evaluated other texts.

2. Lexical text: *nabnītu*<sup>19</sup> XXXII (*UET* VII, 126 = U.3011), obv., cols. i and ii. This text gives the names, number and qualifiers of a series of nine strings in both Sumerian and Akkadian. It was unearthed at Ur, at the site of *Dublamaḫ*, south of the main courtyard in the late twenties by Sir Leonard Woolley<sup>20</sup> who gave it the field number U.3011. It is a late Babylonian copy of 32<sup>nd</sup> tablet of the series *nabnītu*, one of the great lexical texts. It was originally published by Kilmer<sup>21</sup> in one of her early papers and published again by her in 1965.<sup>22</sup> The late Professor Gurney of the University of Oxford published his hand copy of the tablet in his VII<sup>th</sup> volume of the *Ur Excavation Texts*<sup>23</sup> (*UET*) and renamed it *UET* VII, 126, being the 126<sup>th</sup> text in his volume. Although this is a late copy of the first millennium B.C., I will advance that the Sumerian nomenclature originally dates from the early to mid-third millennium B.C.
3. Text of theory. *CBS* 10996. This tablet was published by Kilmer in 1960<sup>24</sup>. It was found at the site of Nippur and was originally thought to be from the Kassite Period, about 1500 B.C. It is probably Neo-Babylonian, early first millennium B.C. It lists a series of intervals “adapted” to a heptachordal instrument. However, the evidence and extrapolation reveal that the text had been devised, originally, for a span of 13 degrees. On this basis, the original theory would have dated from the early to mid-third millennium B.C. since the few stringed instruments in the iconography with a large amount of strings date from that period.
4. Text of Theory. *UET* VII, 74. This cuneiform tablet dates from the Old-Babylonian Period, about 1800-1750 B.C. It was excavated by Sir Leonard Woolley at Ur in southern Iraq and was published by Gurney<sup>25</sup> in 1968, and by others. This text has generally been mislabelled as a “tuning text” and a “re-tuning text”. It is neither for the reason that it does not say how to tune anything. It gives instructions for the construction of a system stemming from a generative pitch set the tuning method of which not being provided.
5. *CBS* 1766. Text of theory. This tablet with a heptagram inscribed in concentric circles shows evidence of an unqualified

heptatonic tuning system along with a possible device, a “computer” to guide the musician in his tuning and scale construction. It is unprovenanced and undated because it was not found in context but was acquired from the Khabaza collection<sup>26</sup>. The tablet is hosted at the University Museum of the University of Pennsylvania. However, many of the tablets in the collection seem to originate from Nippur. On the basis of its contents, I would date it from 1200 to 800 B.C.

6. Music notation. H. 6 = (RS 13.30 + 15.49 + 17.387). The tablet I have chosen to illustrate my argumentation is the only one, out of 29, which could be fully reconstructed from 3 fragments. It was excavated during pre and post Second World War French missions at Ras Shamra, (Ugarit) Northwest Syria, conducted by the French scholar Claude Schaeffer.<sup>27</sup>

### I - Mathematical Texts

CBM 11340 + 11402, obv. and rev.; CBM 11368, rev.; CBM 11902, obv.; CBM 11097, rev.

Sometime in 2007 I was researching cuneiform mathematical texts which might be inscribed with pitch quantification. More precisely, I was looking for numbers giving ratios of Just Intonation between them. Ancient Near Eastern music theoreticians would have used the sexagesimal system rather than the decimal, as the former is ideally suited to Just Intonation<sup>28</sup>. My investigation led me to Hilprecht’s work where I found what I was looking for<sup>29</sup>. Margaux Bousquet’s and Leon Crickmore’s aforementioned work confirm that these tables were well recognised, from pre-Hammurabi Elam, to Nippur and Sippar, and date from around 2200 B.C.

Hilprecht referred to the texts as tables of multiplication and division. However, he did not fully understand their purpose because in 1906, when he published them, texts of musical theory, which would have focused his mind on musicology, had not yet been published<sup>30</sup>. In all cases, Elamite and Babylonian, the tablets share two principal features:

1. The numbers inscribed are not consecutive. They are often separated from each other by comparatively large intervals.
2. Besides 3 and 5, no indivisible number or its multiple is multiplied and therefore there is absence of 7 ; 11 ; 13 ; 14 ; 17 ; 19 ; 21 ; 22 ; 23 ; 26 ; 28 ; 29 ; 31 ; 33 ; 34 ; 35 ; 37 ; 38 ; 39 ; 41 ; 42 ; 43 ; 44 ; 46 ; 47 ; 49 ; 51 ; 52 ; 53 ; 55 ; 56 ; 57 ; 58 ; 59 ; 61 ; 62 ; 63 ; 65 ; 66 ; 67 ; 68 ; 69 ; 70 ; 71 ; 73 ; 74 ; 75 ; 76 ; 77 ; 78 and 79.

The remaining numbers are regular numbers<sup>31</sup> as they evenly divide powers of 60. They can be characterized as having only 2, 3, or 5 as prime factors. This is a specific case of the more general *k*-smooth numbers, *i.e.*, a set of numbers that have no prime factor greater than *k*. In music theory, regular numbers occur in the ratios of tones of Just Intonation, also called “5-limit tuning” for this reason. Thus all remaining numbers would quantify a descending diatonic pitch set of Just Intonation from 27 to 81, descending because the ratios arising from them would be ratios of string lengths rather than ratios of frequency, and composed of diatonic intervals of just intonation *d-c-b-a-g-f-e-d-c-b-a-g*, on the basis of the ratios formed by the quantifiers which are regular numbers ( $2^p3^q5^r$ ). While it would be unreasonable to assume that these tables were only used for the purpose of music theory, it would be equally unreasonable to assume that they were not used for it.

The four fragmentary texts can be reconstructed as one table as follows:

1	8.640.000	<i>A-AN</i> <sup>24</sup>	25	518.000
2	6.480.000		27	480.000
3	4.320.000		30	432.000
4	3.240.000		32	405.000
5	2.592.000		36	360.000
6	2.160.000		40	324.000
8	1.620.000		45	288.000
9	1.440.000		48	270.000
10	1.296.000		50	259.000
12	1.080.000		54	240.000
15	864.000		60	216.000
16	810.000		64	202.500
18	720.000		72	180.000
20	648.000		80	162.000
24	540.000		81	160.000

Fig. 1. Reconstructed table<sup>32</sup>.

Hilprecht attempted at finding a reason for this table and found some answers in Plato’s Republic, Book VIII, 546, B-D.<sup>33</sup> It makes little doubt that Plato attempted at what proved to be a very successful numerological-mythological manipulation of a much older Babylonian story to which he never referred, as far as we know. As basis for all of his calculations, he uses the Pythagorean triangle. The right-angled triangle in question is one in which both sides are 3 and 4 with a hypotenuse of 5, naturally.<sup>34</sup> The right-angled triangle has sides which measure 3, 4 and 5. Therefore they have 3:4:5 as ratios between them. The ratio of 5:6 is made up from the doubling of side 3 in relation to the hypotenuse. Ratios of 1:2 and 2:3 arise from the halving of 4. Thus we have 1:2; 2:3; 3:4; 4:5 and 5:6. These ratios correspond to the first divisors in Hilprecht’s reconstruction. However, the divisor “1” should relate to 12,960,000, and not to 8,640,000 whose divisor should be  $1^{1/2}$ . Hilprecht was

concerned by this discrepancy (while another problem was discussed by Scheil<sup>35</sup>) and writes :

“I am unable to explain this strange phenomenon. Possibly we have to regard it as an abbreviated expression well understood by the Babylonians”.<sup>36</sup>

I do not see, either, any reason for this other than an irrational one, or, as Leon Crickmore puts it to me, in a private communication:

“... could line one, for example, be a concession to practical musicians, who are not generally noted for their mathematical expertise? Or, could it be a reminder for theoretical musicians that the whole of these tables can have an application in a musical context? Or is it simply the scribe’s dedication of the table to Ea, the ‘god’ of music?”.<sup>37</sup>

Indeed, if we read the sign as *šuššu* = 60, god Anu’s number, referring to the musical string of 60 *ubanātu* (fingers),<sup>38</sup> then  $60 \times \frac{2}{3} = 40$  which is god Ea’s number<sup>39</sup>. The table which follows gives the full range of regular numbers, their ratios and corresponding pitches transcribed from our mathematical tablets.

Number	Pitch	Ratio	Number	Pitch	Ratio
2	B <sup>7</sup>		27	D <sup>4</sup>	
		3:2			10:9
3	E <sup>7</sup>		30	C <sup>4</sup>	
		4:3			16:15
4	B <sup>6</sup>		32	B <sup>3</sup>	
		5:4			9:8
5	G <sup>6</sup>		36	A <sup>3</sup>	
		6:5			10:9
6	E <sup>6</sup>		40	G <sup>3</sup>	
		4:3			9:8
8	B <sup>5</sup>		45	F <sup>3</sup>	
		9:8			16:5
9	A <sup>5</sup>		48	E <sup>3</sup>	
		10:9			25/27
10	G <sup>5</sup>		50	E <sup>b3</sup>	
		6:5			27:25
12	E <sup>5</sup>		54	D <sup>3</sup>	
		5:4			10:9
15	C <sup>5</sup>		60	C <sup>3</sup>	
		16:15			16:15
16	B <sup>4</sup>		64	B <sup>2</sup>	
		9:8			9:8
18	A <sup>4</sup>		72	A <sup>2</sup>	
		10:9			10:9
20	G <sup>4</sup>		80	G <sup>2</sup>	
		6:5			81:80
24	E <sup>4</sup>		81	g <sup>2</sup>	
		25:24			
25	E <sup>b4</sup>				
		27:25			

Fig. 2. Pitch values and ratios from regular numbers in mathematical tables.

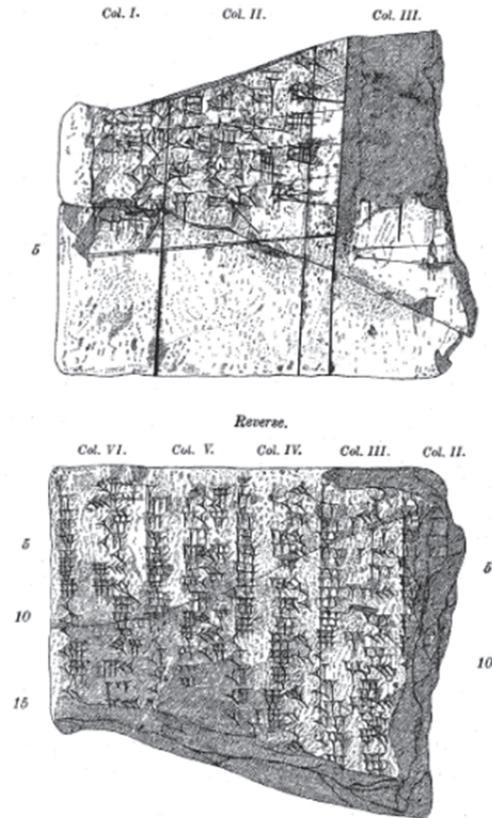


Fig. 3.1. Hilprecht’s hand copies of CBM 11097, rev.

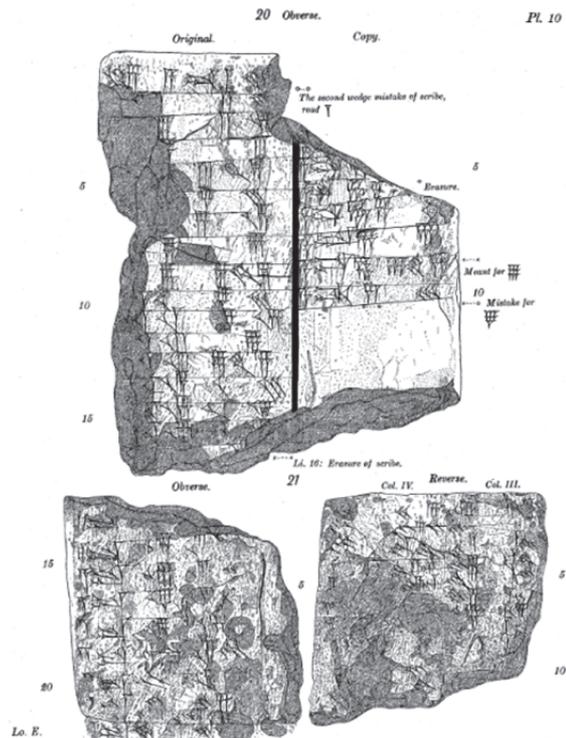


Fig. 3.2. Hilprecht’s hand copies of CBM 11340 + 11402, obv. and rev.

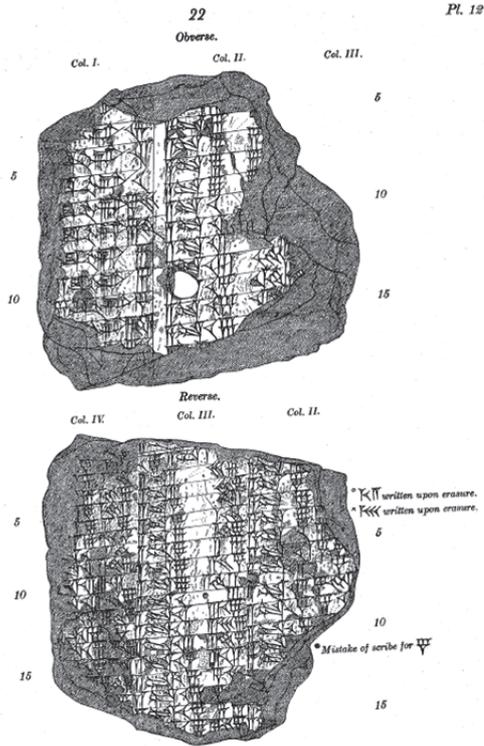


Fig. 3.3. Hilprecht's hand copy of CBM 11902, obv.



Two thirds of 1 is 0;40	The reciprocal of 24 is 0;02 30
Its half is 0;30	
The reciprocal of 2 is 0;30	The reciprocal of 25 is 0;02 24
The reciprocal of 3 is 0;20	The reciprocal of 27 is 0;02 13 20
The reciprocal of 4 is 0;15	The reciprocal of 30 is 0;02
The reciprocal of 5 is 0;12	The reciprocal of 32 is 0;01 52 30
The reciprocal of 6 is 0;10	The reciprocal of 36 is 0;01 40
The reciprocal of 8 is 0;07 30	The reciprocal of 40 is 0;01 30
The reciprocal of 9 is 0;06 40	The reciprocal of 45 is 0;01 20
The reciprocal of 10 is 0;06	The reciprocal of 48 is 0;01 15
The reciprocal of 12 is 0;05	The reciprocal of 50 is 0;01 12
The reciprocal of 15 is 0;04	The reciprocal of 54 is 0;01 06 40
The reciprocal of 16 is 0;03 45	The reciprocal of 1 00 is 0;01
The reciprocal of 18 is 0;03 20	The reciprocal of 1 04 is 0;00 56 15
The reciprocal of 20 is 0;03	The reciprocal of 1 21 is 0;00 44 26 40
	Its half

Fig. 4. MLC 1760, Sippar? Table of reciprocals. After Clay.



Fig. 5. After Scheil, RA 12, 1915.

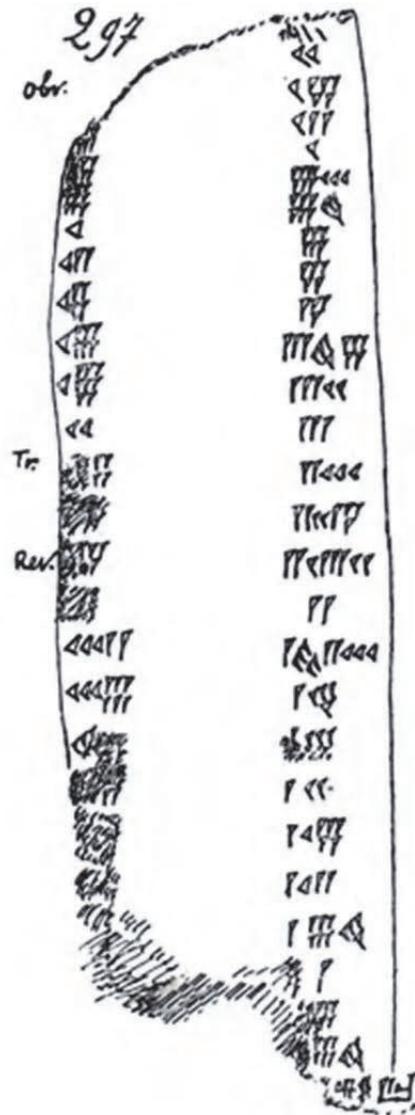


Fig. 6. After Van der Meer.<sup>40</sup>

*II - Lexical text: nabnītu*<sup>41</sup> XXXII (UET VII, 126 = U.3011), Obv., Cols. I and II.



Fig. 7. Gurney's copy of UET VII 126, cols. i and ii relevant.<sup>42</sup>

Line	Sumerian	Akkadian	Translation
1	sa.di	<i>qud-mu-u/m</i>	front string
2	sa.u.4	<i>šū-mu-šū-um</i>	next string
3	sa.3.sa.sig	<i>šū-aš-šū qa-a/t-nu</i>	third, thin string
4	sa.4.tur	<i>a-bu-nu-šū</i>	fourth, small/Ea-created-string
5	sa.di.*5	<i>ba-am-šū</i>	fifth string
6	sa.4.a.ga.gul	<i>ri-bi ūb-ri-im</i>	fourth behind string
7	sa.3.a.ga.gul	<i>šal-šū ūb-ri-im</i>	third behind string
8	sa.2.a.ga.gul	<i>šī-ni ūb-ri-im</i>	second behind string
9	[sa.1].a.ga.gul	<i>ūb-ri-im</i>	behind string
10	[9].sa.a 9	<i>pi-ū-nu</i>	nine strings

Fig. 8. UET VII 126. Sumerian, Akkadian and translation, obv., lines 1-10.<sup>43</sup>

It has now been safely established that this text was written during the first quarter of the first millennium. Previously, it had been dated to the Old-Babylonian Period, about 1800 B.C. because of the presence of mimation in the orthography.<sup>44</sup> Here, the date at which the tablet was inscribed is not as important as the period at which the original text was devised. On account of the Sumerian column, it could be construed that it had been Sumerian, dating from the third millennium B.C. During the first millennium, however, there are instances where scribes would translate their texts into Sumerian, as an exercise. But in the present text, there are inconsistencies between the Neo-Babylonian and Sumerian which might indicate that the Sumerian was indeed authentically Sumerian of the Sumerian period and not a simple first millennium translation of Neo-Babylonian into Sumerian. On this basis I would date the original text to the mid-third and perhaps late-fourth millennium.

An interesting feature of the text is that it lists nine strings, unequivocally – the last line confirming it, additionally – of an undefined stringed instrument, most likely to be a large boviniform lyre since there were no small occurrences of such at that period. Most large

models were boviniform<sup>45</sup> (Fig. 9). A second interesting feature of the text is that the strings are numbered palindromically, that is 1-2-3-4-5-4-3-2-1 with locative indications, as we can read from the translation, *i.e.*, “first string of the front”; “first string of the back”, etc., and others with adjectives or adjectival locutions such as “third thin-string”, and “fourth string created by the god Ea”.

Thus we have strings placed at the front and strings placed at the back of the instrument. But which is front and which is back is not said. It would appear logical that the front of the instrument would be at the head of the animal. However, we have no textual evidence for it and the hypothesis must remain conjectural.

The third and fourth strings of the front would have diverged from the general symmetry of the nomenclature and we shall see later with text UET VII, 74 that the relation of string 3, “the thin one”, with its reciprocal, string 7 “of the back” was in fact a form of tritonic dissonance that was corrected by the “fourth string of the front”, the string that was “corrected/made by the god Ea” who happens to be the god of music. Should we omit the 3<sup>rd</sup> and 7<sup>th</sup> string, we would have an “anhemitonic” arrangement which would have preceded, or lived alongside “diatonicism” and was force-fitted into it.



Fig. 9. (Above left) The author and Jerry Baker, museum technician, carefully moving the silver lyre of Ur, from Private Grave 1237, Number U.12354 = B.M.121199, about 2600 B.C., for inspection, at the British Museum; (below) the author's replication of the silver lyre.

The origin of this fan-like disposition would, I contend, come from prehistoric times. A solitary singer 10,000 or more years ago makes music. He may or not be accompanying himself with any instrument but what is certain is that he would start his song, probably a very simple improvisation, from a pitch where his voice was comfortable and from which he would ascend or descend as pleased him and in agreement with his mood. This would be the starting and the central note of his song that would have kept its place, much later, on the bovine form lyre, as the central string.

A feature of the large lyres of the fourth and third millennia is that their smallest string is in the middle. (Fig. 10) That peculiarity would agree with both my hypothesis and the nomenclature in this text. Later, around 2600 B.C., the string plan shifted towards the player, or the back of the instrument. Thus the string plan from its original symmetric arrangement, became asymmetric, (Fig. 11) more suited to some form of diatonism.<sup>46</sup>



Fig. 10. Symmetric bovine form lyre from Ur, ca. 2600 B.C.<sup>47</sup>



Fig. 11. Asymmetric bovine form lyre from Tello, ca. 2300 B.C.<sup>48</sup>

There is a rare monumental lyre from Karnak in Ancient Egypt, dated around 1300 B.C., (Fig. 12) where two blind-folded musicians play, symmetrically, of the same enneachordal monumental lyre and where the central string is the shortest.

Note the presence of a small portable lyre to the right, also played by a blind-folded musician. It appears that in Ancient Egypt, both monumental and small lyre cohabitated around 1300 B.C. unlike in Mesopotamia

where at that time, large models had all but vanished. I am of the opinion that this monumental instrument was fitted with two sets of five conjunct strings sharing a central one, and that they would have been tuned anhemitonically, hypothetically g-a-c-d-e-d-c-a-g, since this arrangement would have allowed for both musicians improvising without great risk of dissonance.<sup>49</sup>



Fig. 12. Symmetric monumental lyre from Karnak, Ancient Egypt, ca. 1300 B.C.<sup>50</sup>

Thus the large Sumerian bovine lyres might have initially been tuned anhemitonically, then were adapted to hemitonic diatonism which was responsible for shifting the string plan towards the player. The nomenclature would have kept the etymological traces of the historical development of the instrument. Thus the Sumerian Period might have witnessed anhemitonism and the Babylonian Period, diatonism. However, this remains conjectural and is mainly based on organological observation<sup>51</sup> of string plans from the iconography.

This text of only ten lines is extremely rich in content. It is not a text of theory but most probably constitutes scribal observation of a musical instrument. The scribe would have asked the musician to describe his or her instrument and this is what *nabnitu* XXXII (*UET* VII, 126) is all about.

If this, in any way, shows evidence of modal expression is difficult to establish. However, some of the terms are precise and others are less so. For instance, strings 1, 2, of the front, five of the middle; 4, 3, 2 and 1 of the back would logically indicate a series of contiguous pitches. Strings 3 and 4 of the front diverge from this rule. Would this express that the variation that was brought to these two strings was only describable by imprecise terms of “thinness” and of “godly intervention?”, or might these terms locate dissonance and its correction, in a tonal context, as I have already hypothesised, is difficult to assess.

If we relate the mathematical texts discussed above, to the present tablet, then the symmetry expressed within would suggest that the palindromic nine pitch set, an

enneachord, would place itself in the range 36 to 81 with string length quantification of: 36; 40; 45; 48; 54; 60; 64; 72 and 81. This assumption will seem far-fetched to the enlightened musicologist. However the fourth text discussed in the present paper, *UET* VII, 74 = (U.7/80), will confirm that my assumption is, logically, correct.

There is another important clue hidden in our text. I am of the opinion that not only is it a nomenclature of strings but that additionally it shows how the enneachord was tuned. This is based on the symmetrical pattern in the nomenclature and explains the variations given to strings three and four of the front, “thin” and “Ea-created”, respectively. This hypothesis is reinforced by pitch quantification given in aforementioned mathematical texts and gives justification for the presence of the number 81.

I will now explain the tuning procedure. From the central note, the axis of symmetry, labelled “5”, fifths are projected toward the base and toward the treble:

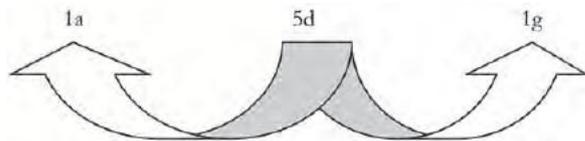


Fig. 13. Projection of fifths from string 5 defining the boundaries of the enneachord.

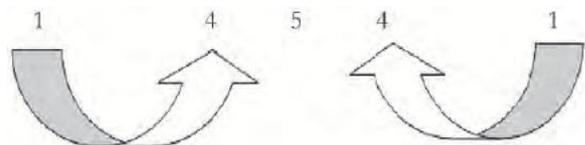


Fig. 14. Projection of fourths from the boundaries of the enneachord.

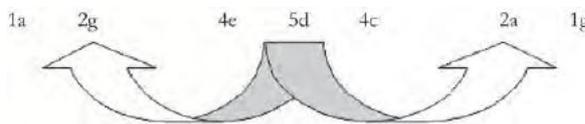


Fig. 15. Projection of fourths from central string 5.

These results in an anhemitonic tuning: a-g-e-d-c-a-g. In this construction, the tritone will place itself on 3 “of the front” and 3 “of the back” and come from the tuning of just thirds, minor and major, from the boundaries of the enneachord.

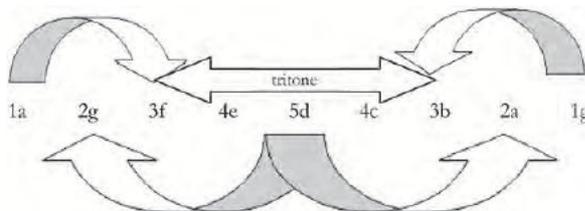


Fig. 16. The tritone results from the tuning of just major thirds (5:4) from the boundaries of the enneachord.

The placement of a tritone results in an enneachordal diatonic tuning in Just intonation as follows: 10:9; 9:8; 16:15; 9:8; 10:9; 27:25; 10:9; 9:8, which in cents is: 182; 204; 112; 204; 182; 133; 182; 204 amounting to 1403 cents, an enneachord. However, this construction poses a problem in relation to pitch quantification with regular numbers as a Just major third projected from strings 1 and 3 9 (g-b) of the back will result in the invalid figure of 64.8 since it is not an integer: it should be 64, for “b” in relation to “g”. Thus the presence of 81/80 finds here its justification as should we multiply the lower Just fifths 3:2 by 80/81 we have a smaller fifth of 40:27, a grave fifth, which will correct 64.8 to 64. This discrepancy shows once more the inability in Antiquity to find an ideal system of quantification without “doctoring” figures.

Thus, the enneachord is an imperfect system when it becomes diatonic because the tritone sits on two conjunct fifths. Its construction in Just intonation requires the syntonic comma to “tame” its imperfection. Later, in Classical Greece, the imperfections of the tetrachord and of the octave were also tamed by the same mathematical devices. In the Ancient Near East, the fundamental fifth 3:2 is made up of descending 16:15; 9:8; 10:9 and 9:8 = 112; 204; 182; 204 cents, and is quantified in sexagesimal regular integers as 30; 32; 36; 40 and 45.

Thus it can be assumed that the theory of music in the Ancient Near East took the Just fifth as fundamental interval and that two such Just fifths as with *nabritu* XXXII and with *UET*, VII, 74, and three conjunct fifths, such as with *CBS* 10996, since three conjunct just fifths amount to a triskaidecachord, expanded the system according to requirements.

Here we can witness, probably, for the first time in the history of music, the moment when theory diverges from praxis: Modality would be music that could not be notated.

*CBS* 10996<sup>52</sup>



Fig. 17. *CBS* 10996. The framed part only is about musical nomenclature.<sup>53</sup>

This tablet was published by Professor Kilmer<sup>54</sup> in 1960. It was found at the site of Nippur and was originally thought to be from the Kassite Period, about 1500 B.C. All now agree that it is Neo-Babylonian, early first millennium B.C., but there again it is possible that this was a copy of a far older text on the basis that the terminology which it gives is known from, *UET VII*, 74, (U.7/80) dated *ca.* 1800 B.C.

It was possible to reconstruct its contents by extrapolation since there was a recurrence of two numerical patterns. For instance, the second line of the top left of the tablet (which is numbered 7, thereafter) has 𒌦 𒌦: which are the signs for 6 and 3.

The following line has 𒌦 𒌦: which is 3 and 5. Since the following line has 7-4, followed by 4-6, it was possible to find out that the beginning of line 6, 𒌦 𒌦 must be 2-4. This revealed the following pattern: 4-1/1-3; 5-2/2-4; 6-3/3-5; 7-4/4-6. The pattern then changes to 1-5/7-5; 2-6/8-6, and so forth. However this is nothing more than the inversion of the first series. In music theory the inversion of the fifth 1-5 is the fourth 4-1 where 1 is either a tonic or the octave<sup>55</sup>. Line 7 continues with the sign SA<sup>56</sup> as we have seen in the previous tablet. It is followed by, *kitmu*. At line 11 the pattern changes and starts with the logogram SA followed by the names of the strings, that is string first and string fifth. and not string 1 and string 5 followed by the enumeration of the numbers and then by the term to which they equate as we had it from line 6 onward, *i.e.* 1-5 SA *niš tuhri*. From this it was clear that the terms following the numbers were the names given to the intervals.

It will be observed that this text was devised for a seven-stringed instrument on the basis that seven is the largest number in the tablet. Transliteration and translation of the left column, lines 11 to 24.

This schematic representation (Fig. 19) will reveal that most of the intervals listed have been inversed in order to fit within the heptachordal span. However, it is evident that this broken pattern needs to be reconstructed in order to bring back these intervals to their original pattern.

Transliteration and translation of the left column, lines 11 to 24.

Lines	Akkadian numbers and names	Translation
11	1-5 <i>niš tuhri</i>	rise of the equivalent
12	7-5 <i>šeru</i>	song
13	2-6 <i>išartu</i>	normal/erect/straight
14	1-6 <i>šašatu</i>	third
15	3-7 <i>embūbu</i>	reed-pipe?
16	2-7 <i>rebūtu</i>	fourth
17	4-1 <i>nīd qablī</i>	fall of the middle
18	1-3 <i>išqu</i>	lot/portion
19	5-2 <i>qablītu</i>	middle
20	2-4 <i>tītur qablītu</i>	bridge of the middle
21	6-3 <i>kitmu</i>	closing
22	3-5 <i>tītur išartu</i>	bridge of the normal/erect/straight
23	7-4 <i>pītu</i>	opening
24	4-6 <i>serdū</i>	lament

Fig. 18. Akkadian list of numbers and names from CBS 10996, lines 11 to 25. Neo-Babylonian.

Most of my philologist colleagues have failed to understand this reconstruction and consequently have assumed and published that the Babylonians used intervals of fifths, fourths, thirds and sixths having failed to see that fourths and sixths were placed, as they are in this text, as the consequence of being adapted to a heptachordal instrument.

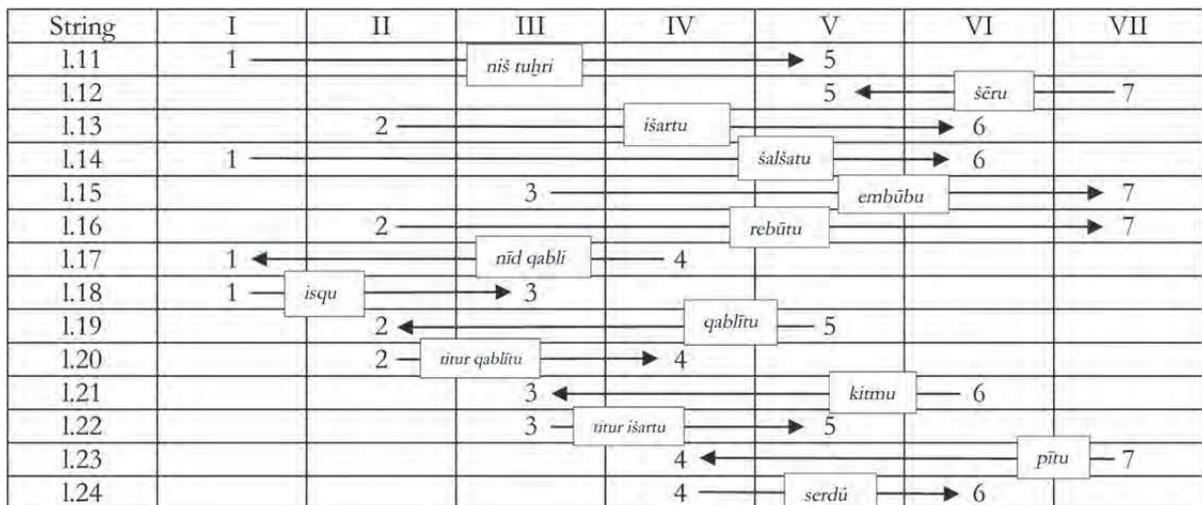


Fig. 19. Schematic representation of CBS 10996, lines 11-25 with arrows indicating the polarity.

Strings	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
L.11	1		niš tuḫri		5								
L.12					5	šēru	7						
L.13		2		išartu		6							
L.14						6	šašatu	8					
L.15			3		embūbu		7						
L.16							7	rebūtu	9				
L.17				4		nid qabli		8					
L.18								8	išqu	10			
L.19					5		qablītu		9				
L.20									9	tītur qablītu	11		
L.21						6		kitmu		10			
L.22										10	tītur išartu	12	
L.23							7		pītu		11		
L.24											11	serdū	13

Fig. 20. Schematic reconstruction of CBS 10996. Lines 11-24.

My reconstruction showing a span of thirteen pitches agrees with the rare examples in the Sumerian iconography, exclusively, where some monumental lyres are fitted with as many strings. Elamite harps of the mid-first millennium B.C. have large spans, and as many as thirty strings can be counted. However, almost two millennia separate Sumerian lyres from Elamite harps. Hardly, these instruments can be compared on either organological, or theoretical grounds. It is most likely that when stringed instruments were produced with smaller spans that the original intervals were inverted to fit in with the smaller string plans. As we shall see with the next text, *UET VII, 74* (U.7/80), dating from the Old-Babylonian Period, the intervals are inverted to fit an enneachord similar that that described in text *UET VII, 126* (U.7/80).

It is impossible to say at that point of our analysis which was the direction of the pitch set. However, we can safely establish that during the Old-Babylonian Period, and probably a millennium before, the span was of thirteen pitches, and on which a series of seven fifths and seven thirds rested. Because the intervals had different names we can therefore derive that 1) they were filled and 2) that each was different from the others. That they were different is plausible because the sexagesimal quantification resulting from Just intonation has two types of tone: 9:8 and 10:9 and three types of semitones: 16:15; 24:25 and 27:24 allowing for seven *genera* of fifths and fourths. This is very important because it might point to the origins of the Arabian *ajnās* which are the building blocks of the *maqāmāt*. This might constitute evidence of modality in the music of the Ancient Near East.

However, the position of the thirds is not clear as it would have seemed more logical to place them, minor and major, within the fifth. Since this text dates from the first millennium, it is a possibility that they were listed as complementary to fifths to complete a heptatonic sequence. As we shall see later, text *CBS 1766* provides

evidence of heptatonic construction and dates from 1200 to 800 B.C.

This tablet dates from the Old-Babylonian Period, about 1800 B.C. It was unearthed by Sir Leonard Woolley at Ur in the winter of 1928-29 and was published about forty years later in 1968 by the late Professor Gurney<sup>57</sup>. At that time no scholar had yet hypothesised that the scale may be descending.

*UET VII, 74* = (U.7/80)

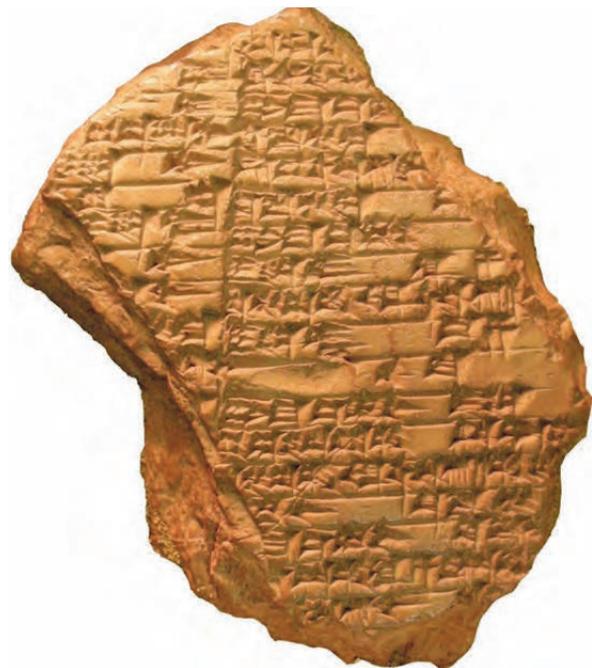


Fig. 21. Author's photograph of the cast of *UET VII, 74* (U.7/80)<sup>58</sup> with kind permission of the Trustees of the British Museum.

Consequently, Gurney's paper was presented with the assumption that the system was ascending. Then in 1982, Vitale<sup>59</sup> suggested that it might be descending. He was not taken seriously until the Leiden Assyriologist Th.J.H. Krispijn corrected Gurney's reading of line 12 from Sumerian *NU SU* to Old-Babylonian *nu-su-ḥu-um* from the verb *nasāḥum*, "to tighten". This new term, *nasāḥum*, Sumerian *gíd-i*, or *nussuḥum*, Sumerian *zi-zi*, is the technical verb for "to tighten" strings. Its antonym is *ne'um*, Sumerian *tu-lu*. Enlightened by Krispijn's paper, Gurney<sup>60</sup> published another in 1994 in which he proposed the transliteration in Figure 22.

This fragmentary tablet is composed of two types of quatrains in the form of *protasis/apodosis*<sup>61</sup>. Type A up to line 11, included, and type B from line 13.

Type A says:

- If (*protasis*) the instrument is tuned in the scale of "1".
- The interval placed between strings "x" and "y" is "unclear" (tritonic?).
- **Tune up** string "x" (or "y"), (or "x" and "y").
- Then (*apodosis*) your instrument will be in the scale of "2".

Then after line 12 instructions are to "tune down".

Quatrains of type B consist in reversing the action of quatrains type A:

- If (*protasis*) the instrument is tuned in the scale of "2".
- The interval placed between strings "x" and "y" is "unclear" (tritonic?).
- **Tune down** string "x" (or "y"), (or "x" and "y").
- Then (*apodosis*) your instrument will be in the scale of "1".

The formula in this text, *UET VII, 74 (U.7/80)* is symmetrical with its axis at line 12. It echoes the symmetry in *UET VII, 126 (U.3011)*, around string five.

The tablet is much damaged. However, the pattern in its remaining quatrains allows for reconstructive extrapolation (Fig. 24).

This reconstruction has clear instructions: It explains how to generate scales *based on the tension and on the relaxation of strings*, exclusively (and not with ratios of string length). This means that during the Old-Babylonian Period, theory and praxis were based on Just intervals since "justness" would have been achieved when beats stopped.

In each quatrain, i) a scale is named. ii) The location of "a bad sounding" interval (tritone) is located. iii) Instructions are given to "tune-up" or to "tune-down" one (or two strings). iv) The outcome is a new scale. The quatrain which follows has the same instructions (for the scale that the previous quatrain generated). The quatrains succeed each other until the last which is the seventh. It generates a scale with the same name as the first one but

which is (approximately) one semitone higher than the first one.

- 1 e-e]m-b[u-bu-um la za-ku
- 2 ša-al-š[a-am qa-at-na-am tu-na-sà-aḥ-ma]
- 3 e-em bu-bu-u[m iz-za-ku]
- 4 šum-ma ḡ<sup>is</sup>Z[Ā.MÍ e-m-bu-bu-um-ma]
- 5 ki-it.mu-um [la za-ku]
- 6 re-bi úḥ-ri-im [tu-na-sà-aḥ-ma]
- 7 ki-it-mu-um i[z-za-ku]
- 8 šum-ma ḡ<sup>is</sup>Z.Ā.MÍ k[i-it-mu-um-ma]
- 9 i-šar-tum la za-[ka-at]
- 10 ša-mu-ša-am ù-úḥ-ri-a-a[m tu-na-sà-aḥ-ma]
- 11 i-šar-tum iz-za-[ku]
- 12 nu-su-ḥ[u-um]
- 13 šum-ma ḡ<sup>is</sup>Z.Ā.MÍ i-šar-t[um-ma]
- 14 qa-ab-li-ta-am ta-al-pu-[ut]
- 15 ša-mu-ša-am ù-úḥ-ri-a-am te-[ni-e-ma]
- 16 ḡ<sup>is</sup>Z.Ā.MÍ ki-it-mu-[um]
- 17 [šum]-ma ḡ<sup>is</sup>Z.Ā.MÍ ki-it-m[u-um-ma]
- 18 [i-ša]r-ta-am la za-ku-ta-am t[a-al-pu-ut]
- 19 [re-bi] úḥ-ri-im te-ni-e![-ma]
- 20 [ḡ<sup>is</sup>Z.Ā.MÍ e-em-bu-bu-um]

Fig. 22. Gurney's 1994 transliteration of *UET VII, 74 (U.7/80)*, right column.

In the order in which they appear in my reconstruction, the scales are listed on Figure 23. Some of my colleagues have advanced that these scales were not enneatonic but heptatonic on the basis that it was the instrument that was enneachordal and not the system<sup>62</sup>. My argument against their assumption has been that in this case, what would have been the position of the heptachord within the enneachord? For instance, since enneatonic *išartum* is c-b-a-g-f-e-d-c-b, which of c-b-a-g-f-e-d, b-a-g-f-e-d-c, or a-g-f-e-d-c-b would be the heptachord? Additionally there would not have been the need for seven enneachords to host seven heptachords since each enneachord can host three heptachords.

1. <i>išartum</i>	(c-b-a-g-f-e-d-c-b)
2. <i>qablītum</i>	(f-e-d-c-b-a-g-f-e)
3. <i>niš tuḥrim</i>	(b-a-g-f-e-d-c-b-a)
4. <i>nīd qablim</i>	(e-d-c-b-a-g-f-e-d)
5. <i>pītum</i>	(a-g-f-e-d-c-b-a-g)
6. <i>embūbum</i>	(d-c-b-a-g-f-e-d-c)
7. <i>kitnum</i>	(g-f-e-d-c-b-a-g-f)

Fig. 23. *UET VII, 74*. Old-Babylonian scale system in approximate dynamic notation.

Thus, the various scales produced amount to a system of seven thetical enneatonic scales, each having its own name the nomenclature of which incomprehensible at present. On instruments with larger spans, such as third millennium bovine lyres, it is quite possible that the

scales of the system had been spread dynamically. Fifteen strings would have been needed for a system of seven enneachords. However, both the iconography and the archaeology have only but few examples of a maximum of eleven strings. Therefore the hypothesis of seven enneachords in the dynamic disposition is improbable. Would this mean that initially there were less enneachords in the system?

It is my contention that the theoreticians during the Old-Babylonian Period were facing a dilemma. The older enneatonic system, however beautifully symmetric it had been, was not suited to more “modern” concepts. While the fundamental enneachord would have been sufficient to express various “moods”, our present text reveals a much more practical seven scale system. This would have progressively led to what I would call “proto”-heptatonism which finally became truly heptatonic in the first millennium B.C. as we shall see later with CBS 1766.

The history of music theory is not a clear cut one. Its evolution is in a way similar to the change from old weights and measures to the metric system. In France where the metric system was introduced from

1815 onward, French markets, to this day, still use pre-metric terms adapted to the metric system: a “livre” weighs 500 grammes. Therefore it is highly probable that the same would have applied to music terminology in the Ancient Near East with ancient terms used for new values.

There is another interesting issue arising with regard the generative tuning of the enneatonic system. It is of my opinion that it was tuned as I have explained it with text UET VII, 126 (projecting fifths from the central string and fourths from the boundaries of the enneachord and from the central string and then placing Just thirds) and that method would have produced the scale of *pītum*. However, it is also possible that once fifths were projected from the axis of symmetry, thirds were placed and that tones (and later, semitones) were placed approximately, or in function of modal requirements.

*pītum* means “opening”, a term appropriate since it would “open”, that is starting the scale system which, according to the mathematical texts would be: 36; 40; 45; 48; 54; 60; 64; 72; 81.

First part	Second part
1. If the harp is (tuned in the scale of) <i>išartum</i> (the interval of strings 5 and 2 is) <i>qablītum</i> sounds bad tune up string 5 Then the harp will be (tuned in the scale of) <i>qablītum</i>	1. If the harp is (tuned in the scale of) <i>išartum</i> (the interval of strings 5 and 2 is) <i>qablītum</i> sounds bad tune down strings 2 and 9 Then the harp will be (tuned in the scale of) <i>kitmum</i>
2. If the harp is (tuned in the scale of) <i>qablītum</i> (the interval of strings 1 and 5 is) <i>niš tuḥrim</i> sounds bad tune up strings 1 and 8 Then the harp will be (tuned in the scale of) <i>niš tuḥrim</i>	2. If the harp is (tuned in the scale of) <i>kitmum</i> (the interval of strings 2 and 6 is) <i>išartum</i> sounds bad tune down string 6 Then the harp will be (tuned in the scale of) <i>embūbum</i>
3. If the harp is (tuned in the scale of) <i>niš tuḥrim</i> (the interval of string 4 and 1 is) <i>nīd qablim</i> sounds bad tune up string 4 Then the harp will be (tuned in the scale of) <i>nīd qablim</i>	3. If the harp is (tuned in the scale of) <i>embūbum</i> (the interval of strings 6 and 3) is <i>kitmum</i> sounds bad tune down string 3 Then the harp will be (tuned in the scale of) <i>pītum</i>
4. If the harp is (tuned in the scale of) <i>nīd qablim</i> (the interval of strings 7 and 4 is) <i>pītum</i> sounds bad tune up string 7 Then the harp will be (tuned in the scale of) <i>pītum</i>	4. If the harp is (tuned in the scale of) <i>pītum</i> (the interval of strings 3 and 7 is) <i>embūbum</i> sounds bad tune down string 7 Then the harp will be (tuned in the scale of) <i>nīd qablim</i>
5. If the harp is (tuned in the scale of) <i>pītum</i> (the interval of strings 3 and 7 is) <i>embūbum</i> sounds bad tune up string 3 Then the harp will be (tuned in the scale of) <i>embūbum</i>	5. If the harp is (tuned in the scale of) <i>nīd qablim</i> (the interval of strings 7 and 4 is) <i>pītum</i> sounds bad tune down string 4 Then the harp will be (tuned in the scale of) <i>niš tuḥrim</i>
6. If the harp is (tuned in the scale of) <i>embūbum</i> (the interval of strings 6 and 3 is) <i>kitmum</i> sounds bad tune up string 6 Then the harp will be (tuned in the scale of) <i>kitmum</i>	6. If the harp is (tuned in the scale of) <i>niš tuḥrim</i> (the interval of strings 4 and 1) is <i>nīd qablim</i> sounds bad tune down strings 1 and 8 Then the harp will be (tuned in the scale of) <i>qablītum</i>
7. If the harp is (tuned in the scale of) <i>kitmum</i> (the interval of strings 2 and 6 is) <i>išartum</i> sounds bad tune up strings 2 and 9 Then the harp will be (tuned in the scale of) <i>išartum</i>	7. If the harp is (tuned in the scale of) <i>qablītum</i> (the interval of strings 1 and 5 is) <i>niš tuḥrim</i> sounds bad tune down string 5 Then the harp will be (tuned in the scale of) <i>išartum</i>

Fig. 24. Reconstruction by extrapolation of UET VII, 74 (U.7/80).



Fig. 25. UET VII, 74. Old Babylonian scale system in approximate thetical notation with “tritone” location (underlined).

However, and if I am right in assuming Just intonation tuning, then a Just third tuned from 81 would be 64.8 and not 64 as shown on Figure 27, Col. VII.

This discrepancy is interesting. If G were tuned to 80 instead of 81 then the Just major third projected from it would be 64. Consequently, the fifth V-IX = D-G would be reduced to  $3:2 \times 80:81 = 40:27$ , 680 cents, a grave fifth, and no longer the Just fifth at 702 cents. This is probably why the Just fifth was considered as the only stable interval in the whole system, along with Just thirds (minor and major) of which it is made. Thus as early as in Babylonian times, about 4,000 years ago, the syntonic comma (which I would rename “the comma of Nippur”, or “Nippurian comma”) corrected discrepancies as it will centuries later in Classical Greece where it will be known as the “comma of Didymus”.<sup>63</sup>

At that point of our research, I will put forward that this discrepancy would have partially illustrated the distinction between the “tonal” and the “modal”. In Antiquity, the ‘modal’ would have been the tuning that was used in praxis, but that was incompatible with arithmetical rigour. Soon, mathematicians devised the “Nippurian” comma to bring order in the system, for their own mathematical satisfaction.

Musicians would have never bothered with this dilemma. They would have used, unconsciously, certain combinations of fifths which would have best suited their mood, similarly to the way in which the *qinās* of the *maqām* tradition make up Middle and Near-Eastern scales.

Thus, theoreticians would have reduced the figure for IX of 81 to 80 in order to avoid the problematic VII at 64.8. The tables in figures 28 to 57 analyse each of the scales amounting to the Old-Babylonian system with the corrected figures and taking the scale of *isartum* as c-b-a-g-f-e-d-c-b for convenience.

The pitch set, or scale of *pītum* would have been the scale from which all others were generated. The reason for this assumption is that firstly it agrees with the order in text UET VII, 126, secondly, this order agrees with the regular numbers in the mathematical texts discussed above. Thirdly, the term *pītum* is particularly well suited in that it suggests that this scale was the “opening” one. Therefore, I have reconstructed the scales of UET VII, 74 from it (figures 28 to 57).

The text says that if the *sammu*-instrument<sup>64</sup> is tuned in the scale of *pītum*, then the interval between strings III and VII is “*la zakū*” which we can safely interpret as being a form of “tritone” dissonance that we shall investigate later.

Here I am cautious with the term “tritone” which might not be appropriate because Old-Babylonian “*la zakū*”<sup>65</sup> is too vague a term to ascertain which tritone interval it would be, *i.e.*, of what values it would be made.

*pītum* would be a descending enneatonic scale of 36; 40; 455; 48; 54; 60; 64; 72 and 82, which in cents would be 1382; 1200; 996; 884; 680; 498; 386; 182 and 0. Expressed in ratios, it would be: 20:9; 2:1; 16:9; 5:3; 40:27; 4:3; 5:4; 10:9; 1:1.

The intervals resulting from this construction are :

1. Semitones: 112 cents = 16:15 which is the Just semitone.
2. Tones: 182 cents = 10:9 which is the minor tone in Just intonation ; and 204 cents = 9:8 which is the ninth harmonic and the major tone.
3. Ditones: 386 cents = 5:4, the fifth harmonic and the major third ; 316 cents = 6:5 which is the just minor third ; 294 = 32:27 which is the ‘Pythagorean’ minor third and also known in Arabian lute fretting.
4. Fourths: 498 cents = 4:3, the Just fourth; 520 cents = 27:20 which is the acute fourth.
5. Fifths: 702 cents = 3:2, the Just fifth; 610 cents = 64:45, the diminished fifth which can be taken as tritone; (See below) 680 cents = 40:27, the grave fifth.
6. Tritones: 610 cents = 64:45, the diminished fifth.
7. Sixths: 884 cents = 5:3, the Just major sixth; 814 cents = 8:5, the Just minor sixth.
8. Sevenths: 996 = 16:9, the minor seventh; 1018 = 9:5, the acute minor seventh.
9. Octaves: 1200 cents = 2:1, the Just octave.
10. Ninths: 1382 = 2:1 + 10:9.

## INSTRUCTIONS I

The text tells us that in the scale of *pītum* the interval placed on strings III and VII (*embūbum*) is “tritone” (see Fig. 28). We are instructed to tune up string III. It is not said by what amount should this string III be “tuned up”. However, it is logical that it should be raised by an amount correcting the dissonance to consonance. The consonance should be Just since we are working in Just intonation where Just intervals have no interferential beats between them. Therefore string III should be “tuned up” by an amount which would make the interval between strings III and VII equal to 702 cents = 3:2.

Therefore, string III should be raised by 92 cents (since  $996 + 92 = 1088$ , and that  $1088 - 386 = 702$ ), and the interval between strings III and VII is now a Just fifth at 702 cents = 3:2 (Fig. 29). The outcome of the instruction is that the scale of *pītum*, has now become the scale of *embūbum* (Fig. 30).

*embūbum* would be a descending enneatonic scale, which in cents would be: 1382; 1200; 1088; 884; 680; 498; 386; 182 and 0. Expressed in ratios: 20:9; 2:1; 15:8; 5:3; 40:27; 4:3; 5:4; 10:9; 1:1.

## INSTRUCTIONS II

The text tells us that in the scale of *embūbum* the interval placed on strings VI and III (*kitnum*) is “tritone” (Fig. 31). We are instructed to “tune up” string VI. Now, the interval between VI and III =  $1088 - 498 = 590 = 45:32$ , the tritone. Logic dictates, on the grounds of the regular numbers of the sexagesimal model, that 590 should be corrected to 498.  $590 - 498 = 92$ . 92 cents = 135:128, the larger *limma*. VI =  $498 + 92 = 590$  (Fig. 32).

The outcome of the instruction is that the scale of *embūbum*, has now become the scale of *kitnum* (Fig. 33). *kitnum* would be a descending enneatonic scale, which in cents would be: 1382; 1200; 1088; 884; 680; 590; 386; 182 and 0. Expressed in ratios: 20:9; 2:1; 15:8; 5:3; 40:27; 45:32; 5:4; 10:9; 1:1. This scale introduces one new interval, which is a semitone:  $90 = 256:243$ , the “Pythagorean” *limma*.

## INSTRUCTIONS III

The text tells us that in the scale of *kitnum* the interval placed on strings II and VI (*išartum*) is “tritone” (Fig. 34). We are instructed to “tune up” string II and IX. Now, the interval between II and IX =  $1200 - 590 = 610 = 64:45$ , the diminished fifth. Logic dictates, on the basis of the construction, that 610 should be corrected to 702.  $702 - 610 = 92$ . 92 cents = 135:128, the larger *limma*. In order to correct the dissonance, 92 should be added both to 1200 and to 0 = 1292 and 92 (Fig. 35). This generates the scale of *išartum* (Fig. 36).

This scale of *išartum* starts the second chapter of the instructions. We are now instructed to “tune down” instead of “tuning up”. The system is now reversed, and

in the scale of *išartum*, strings V and II (*qāblitum*) produce a “tritone” interval (Fig. 37). This scale introduces a new interval,  $612 = 729:512$ , the “Pythagorean” tritone which would have been known some 1,200 years before its ascribed inventor thought about it.

We are then instructed to “tune down” II and IX (Fig. 38). However,  $(1292 - 92 = 1200)$  and  $(1200 - 680 = 520)$   $520 = 27:20$ , an acute fourth, not Just by a difference of 22 cents. This generates the scale of *kitmu* (Fig. 39). In the scale of *kitmu*, the interval between strings II and VI (*išartum*) is “tritone” (Fig. 40).

$610 = 64:45$ , is a diminished fifth. We are instructed to “tune down” string VI (Fig. 41). This generates the scale of *embūbum* (Fig. 42), in which we are told that the interval between strings VI and III (*kitnum*) is “tritone” (Fig. 43), with  $590 = 45:32$ , the tritone. We are instructed to “tune down” string III (Fig. 44). This generates the scale of *pītum* (Fig. 45).

In the scale of *pītum* we are told that the interval between strings III and VII (*embūbum*) is “tritone” (Fig. 46). We are instructed to “tune down” string VII (Fig. 47). This generates the scale of *nīd qāblim* (Fig. 48).

We are told that in the scale of *nīd qāblim*, the interval placed between strings VII and IV (*pītum*) is “tritone” (Fig. 49). We are instructed to “tune down” string IV (Fig. 50). This generates the scale of *niš tuḥrim* (Fig. 51).

We are informed that in the scale of *niš tuḥrim*, the interval between strings IV and I (*nīd qāblim*) is “tritone” (Fig. 52).  $600 = 140:99$ . This is the equal tritone.

We are instructed to “tune down” strings I and VIII (Fig. 53). This generates the scale of *qāblitum* (Fig. 54). In the scale of *qāblitum*, we are told that the interval between strings I and VI (*niš tuḥrim*) is “tritone” (Fig. 55).

We are instructed to “tune down” string V (Fig. 56). This generates the scale of *išartum* (Fig. 57). The final scale of *išartum* (see below) is exactly 92 cents = 135:128 (larger *limma*) higher than the initial one (compare with Fig. 36).

Therefore the Old-Babylonian system is composed of the scales on Figure 59.

These figures, as I have mentioned before, relate to the Old-Babylonian system where the second fifth (54 – 81) is reduced to fit the quantification of 54 – 80.

Nevertheless, the inversion of the fifths due to the reduction of the original span to the enneachord might allow for extrapolating their original composition. (It goes without saying that had fifths in our texts been meant to be dyads<sup>66</sup>, there would not have been any logical reason to give them different names. Therefore, this should, once and for all, settle the argument spearheaded by Professor Kilmer that the intervals were empty. It is of my opinion that these fifths were filled as they are in the *ajnās* of the *maqāmāt*<sup>67</sup> which stem, I believe, from the Old-Babylonian material<sup>68</sup>. Text CBS 10996 includes ditones.

These would of course follow the same rule as the fifths and would have been filled since they have, also, different names.

Seven descending diatonic fifths each starting from successive diatonic of a diatonic descending generative pitch sequence would necessarily include a tritone at some point depending with which fifth the sequence started. So it seems logical that the sequence ended with the tritonic fifth. We have a lack of evidence regarding the

dating of the intervallic nomenclature and therefore it is impossible to say if it came before pitch quantification had been instituted – if it ever were.

Thus although it may appear logical that different names of fifths defined fifths differing in their morphology, it is impossible to define their structure securely. However, should we rely on the logical structure of our texts, then the seven fifths would be as shown in Figure 59.

number	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio	A	10:9	G	9:8	F	16:15	E	9:8	D	10:9	C	27:25	B	10:9	A	9:8	G
q.value*	36		40		45		48		54		60		64.8		72		81

\* quantification value

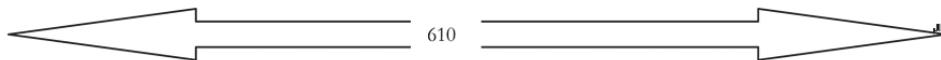
Fig. 26. *pītum* tuning.

<i>pītum</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio		10:9		9:8		16:15		9:8		10:9		16:15		9:8		10:9	
q/i value*	36	182	40	204	45	112	48	204	54	182	60	112	64	204	72	182	80
cents	1382		1200		996		884		680		498		386		182		0

\* q / i value means quantification and intervallic value (in cents)

Fig. 27. Reconstruction of the scale system in *UET VII, 74*, in cents.

III		IV		V		VI		VII
3		4		5		4		3
	16:15		9:8		10:9		16:15	
45	112	48	204	54	182	60	112	64
996		884		680		498		386



996 cents – 386 cents = 610 cents

Fig. 28. Instructions from *pītum*.

III		IV		V		VI		VII
3		4		5		4		3
	9:8		9:8		10:9		16:15	
Cent value	204		204		182		112	
1088		884		680		498		386

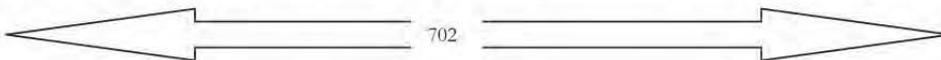


Fig. 29. Instructions.

<i>embūbum</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio		10:9		16:15		9:8		9:8		10:9		16:15		9:8		10:9	
i.value		182		112		204		204		182		112		204		182	
cents	1382		1200		1088		884		680		498		386		182		0

Fig. 30. Scale of *embūbum*.

III		IV		V		VI
3		4		5		4
	9:8		9:8		10:9	
i.value	204		204		182	
1088		884		680		498

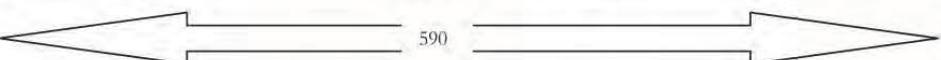


Fig. 31. Instructions: the interval placed on strings VI and III (*kitmum*) is “tritone”.

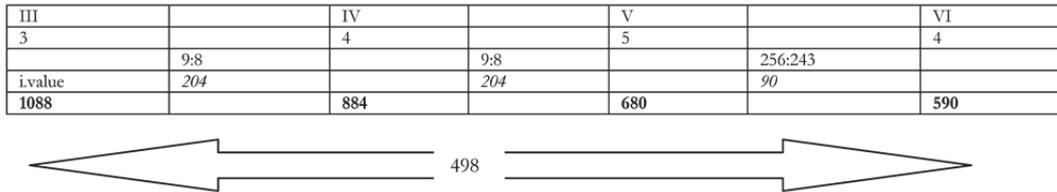


Fig. 32. Instructions: logic dictates that 590 should be corrected to 498, on the basis of sexagesimal metrology of regular numbers.

<i>kitmum</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio		10:9		16:15		9:8		9:8		256:243		9:8		9:8		10:9	
i.value		182		112		204		204		90		204		204		182	
cents	<b>1382</b>		<b>1200</b>		<b>1088</b>		<b>884</b>		<b>680</b>		<b>590</b>		<b>386</b>		<b>182</b>		<b>0</b>

Fig. 33. Instructions: outcome = the scale of *kitmum*.

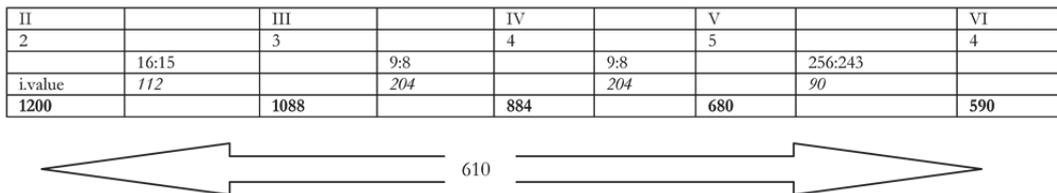


Fig. 34. Instructions: the interval placed on strings II and VI (*išartum*) is “tritone”.

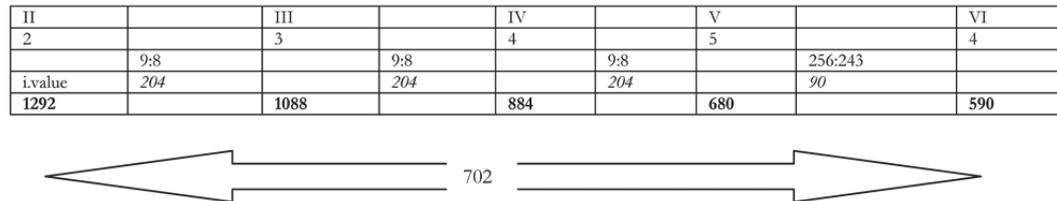


Fig. 35. Instructions: “tune up” string II and IX.

<i>išartum</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio		256/243		9:8		9:8		256:243		9:8		9:8		9:8			
i.value		90		204		204		204		90		204		204		90	
cents	<b>1382</b>		<b>1292</b>		<b>1088</b>		<b>884</b>		<b>680</b>		<b>590</b>		<b>386</b>		<b>182</b>		<b>92</b>

Fig. 36. Instructions: the scale of *išartum* (1).

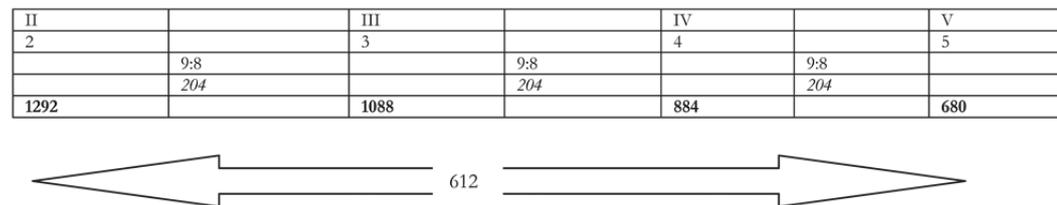


Fig. 37. Instructions: “tune down” producing a “tritone” interval.

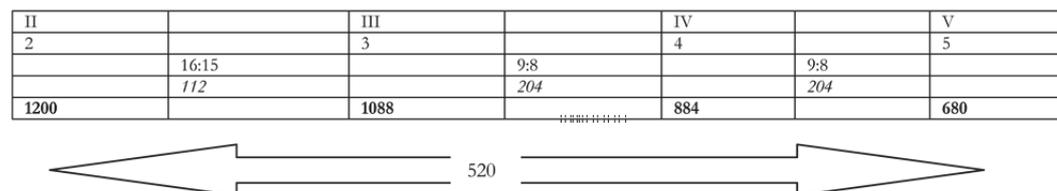


Fig. 38. Instructions: “tune down” II and IX.

<i>kitmu</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio		10:9		16:15		9:8		9:8		256:243		9:8		9:8		10:9	
q.value		182		112		204		204		90		204		204		182	
cents	1382		1200		1088		884		680		590		386		182		0

Fig. 39. Instructions: the scale of *kitmu*.

II		III		IV		V		VI
2		3		4		5		4
	16:15		9:8		9:8		256:243	
40	112		204		204	54	90	
1200		1088		884		680		590

← 610 →

Fig. 40. Instructions: the interval between strings II and VI (*išartum*) is “tritone”.

II		III		IV		V		VI
2		3		4		5		4
	16:15		9:8		9:8		10:9	
40	112		204		204		182	
1200		1088		884		680		498

← 702 →

Fig. 41. Instructions: “tune down” string VI.

<i>embūbu</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio		10:9		16:15		9:8		9:8		10:9		16:15		9:8		10:9	
q.value		182		112		204		204		182		112		204		182	
cents	1382		1200		1088		884		680		498		386		182		0

Fig. 42. Instructions: the scale of *embūbu*.

III		IV		V		VI
3		4		5		4
	9:8		9:8		10:9	
	204		204		182	
1088		884		680		498

← 590 →

Fig. 43. Instructions: the interval between strings VI and III (*kitmum*) is “tritone”.

III		IV		V		VI
3		4		5		4
			9:8		10:9	
	112		204		182	
996		884		680		498

← 498 →

Fig. 44. Instructions: “tune down” string III.

<i>pītum</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio		10:9		9:8		16:15		9:8		10:9		16:15		9:8		10:9	
q.value		182		204		112		204		182		112		204		182	
cents	1382		1200		996		884		680		498		386		182		0

Fig. 45. Instructions: the scale of *pītum*.

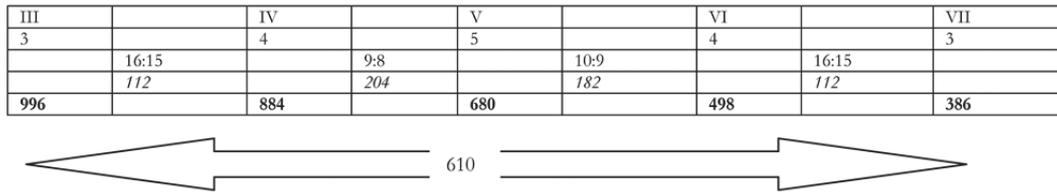


Fig. 46. Instructions: the interval between strings III and VII (*embūbum*) is “tritone”.

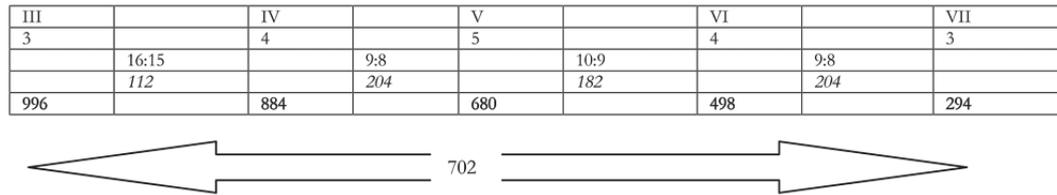


Fig. 47. Instructions: “tune down” string VII.

<i>nīd qablim</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio	c <sup>#</sup>	10:9	b	9:8	a	16:15	g <sup>#</sup>	9:8	f <sup>#</sup>	10:9	e	9:8	d <sup>#</sup>	16:15	c <sup>#</sup>	10:9	b
q.value		182		204		112		204		182		204		112		182	
cents	1382		1200		996		884		680		498		294		182		0

Fig. 48. Instructions: the scale of *nīd qablim*.

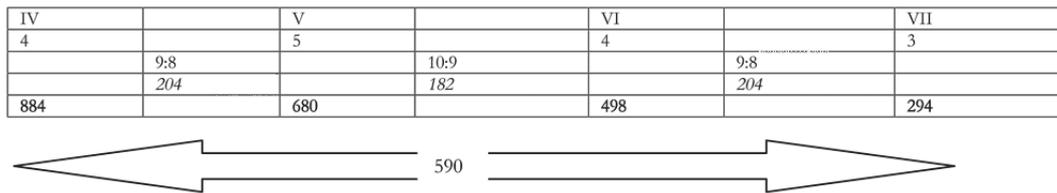


Fig. 49. Instructions: the interval between strings VII and IV (*pītum*) is “tritone”.

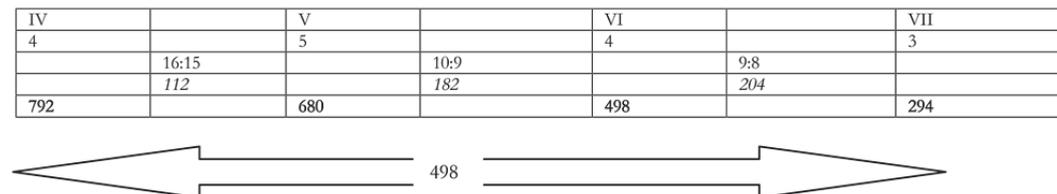


Fig. 50. Instructions: “tune down” string IV.

<i>nīš t.</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio		10:9		9:8		9:8		16:15		10:9		9:8		9:8		10:9	
q.value		182		204		204		112		182		204		204		182	
cents	1382		1200		996		792		680		498		294		182		0

Fig. 51. Instructions: the scale of *nīš tuhrim*.

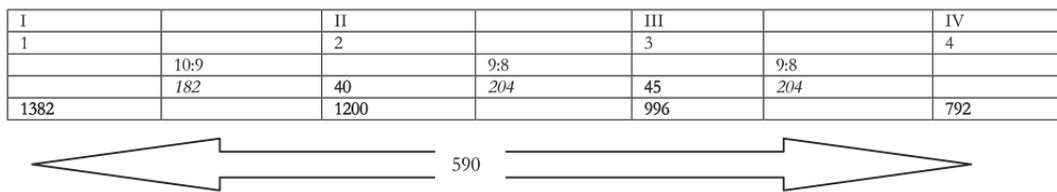


Fig. 52. Instructions: the interval between strings IV and I (*nīd qablim*) is “tritone”.

I		II		III		IV
1		2		3		4
	256:243		9:8		9:8	
	90		204		204	
1290		1200		996		792

Fig. 53. Instructions: “tune down” strings I and VIII.

<i>qablītum</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio		256:243		9:8		9:8		16:15		10:9		9:8		9:8		256:243	
q.value		90		204		204		112		182		204		204		90	
cents	1290		1200		996		792		680		498		294		90		0

Fig. 54. Instructions: the scale of *qablītum*.

I		II		III		IV		V
1		2		3		4		5
	256:243		9:8		9:8		16:15	
	90		204		204		112	
1290		1200		996		792		680

Fig. 55. Instructions: the interval between strings I and VI (*niš tuḫrim*) is “tritone”.

I		II		III		IV		V
1		2		3		4		5
	256:243		9:8		9:8		9:8	
	90		204		204		204	
1290		1200		996		792		588

Fig. 56. Instructions: “tune down” string V.

<i>išartum</i>	I		II		III		IV		V		VI		VII		VIII		IX
order	1		2		3		4		5		4		3		2		1
ratio		256:243		9:8		9:8		9:8		256:243		9:8		9:8		256:243	
q.value		90		204		204		204		90		204		204		90	
cents	1290		1200		996		792		588		498		294		90		0

Fig. 57. Instructions: the scale of *išartum* (2- Compare with Figure 36).

Tune up									
	I	II	III	IV	V	VI	VII	VIII	IX
<i>išartum</i>	1290	1200	996	792	588	498	294	90	0
<i>qablītum</i>	1290	1200	996	792	680	498	294	90	0
<i>niš tuḫrim</i>	1382	1200	996	792	680	498	294	182	0
<i>nīd qablīm</i>	1382	1200	996	884	680	498	294	182	0
<i>pītum</i>	1382	1200	996	884	680	498	386	182	0
<i>embūbum</i>	1382	1200	1088	884	680	498	386	182	0
<i>kitmum</i>	1382	1200	1088	884	680	590	386	182	0
<i>išartum</i>	1382	1292	1088	884	680	590	386	182	92
Tune down									
<i>išartum</i>	1382	1292	1088	884	680	590	386	182	92
<i>kitmum</i>	1382	1200	1088	884	680	590	386	182	0
<i>embūbum</i>	1382	1200	1088	884	680	498	386	182	0
<i>pītum</i>	1382	1200	996	884	680	498	386	182	0
<i>nīd qablīm</i>	1382	1200	996	884	680	498	294	182	0
<i>niš tuḫrim</i>	1382	1200	996	792	680	498	294	182	0
<i>qablītum</i>	1290	1200	996	792	680	498	294	90	0
<i>išartum</i>	1290	1200	996	792	588	498	294	90	0

Fig. 58. The Old-Babylonian system.

<u>Nomenclature</u>	<u>Approximative pitch</u>	<u>Quantification</u>
1. <i>niš tuḫrim</i>	$E^4 - D^4 - C^4 - B^3 - A^3$	24(9 :8) 27(10:9) 30(16:15) 32(9:8) 36
2. <i>išartum</i>	$D^4 - C^4 - B^3 - A^3 - G^3$	27(10 :9) 30(16:15) 32(9:8) 36(10:9) 40
3. <i>embūbum</i>	$C^4 - B^3 - A^3 - G^3 - F^3$	30(16:15) 32(9:8) 36(10:9) 40(9:8) 45
4. <i>nīd qablim</i>	$B^3 - A^3 - G^3 - F^3 - E^3$	32(9:8) 36(10:9) 40(9:8) 45(16:15) 48
5. <i>qablītum</i>	$A^3 - G^3 - F^3 - E^3 - D^3$	36(10:9) 40(9:8) 45(16:15) 48(9:8) 54
6. <i>kitmum</i>	$G^3 - F^3 - E^3 - D^3 - C^3$	40(9:8) 45(16:15) 48(9:8) 54(10:9) 60
7. <i>pītum</i>	$F^3 - E^3 - D^3 - C^3 - (B^{b3} ?)$	45(16:15) 48(9:8) 54(10:9) 60(16:15) (64?)

Fig. 59. Nomenclature of fifths.

It will be immediately obvious that the seven fifths listed above are distinct from one another. This would be the justification for their different names in support of my assumption that intervals were filled and not dyads.

It is my contention that the differences in the aforementioned morphology of fifths would have been much more expressive than that allowed by the sexagesimal regular numbers. This is reflected in the nomenclature which would have distinguished them as nowadays *maqāmāt* nomenclature immediately suggests the mood of the piece to be played, even by non musicians. There is also the probability that the morphology of fifths would additionally have been dependant on the composition of the piece, on the emphasis of the phrase, on the interpretation of the musician and on many other factors in a manner comparable to inflections in poetic recitation, and perhaps in Judaic cantillation, Christian chant, traces of which may be surviving in the Byzantine material, and later in Coranic declamation which all might find their sources in the Babylonian material.

CBS 1766



Fig. 60. CBS 1766. Courtesy of the University Museum of the University of Pennsylvania, Philadelphia.

This text cannot be dated with accuracy as it was also acquired by the University Museum of the University of

Pennsylvania out of archeological context. However, on the basis of its contents I would place it around the turn of the second and first millennia B.C.

The contents are of enormous importance as they constitute the first ever recorded evidence of a truly and unequivocally heptatonic construction based on the alternation of fifths and fourths, a well as the description, possibly, of a device which would have located the seven scales of a heptatonic diatonic system.

The text is composed of a graphic representation of a heptagram<sup>69</sup> inscribed in two concentric circles, and of tables with a majority of unfilled, or unreadable columns and rows. However, the columns that can be read hold essential integers. The header of the table is also unreadable although some attempts have been proposed.<sup>70</sup>

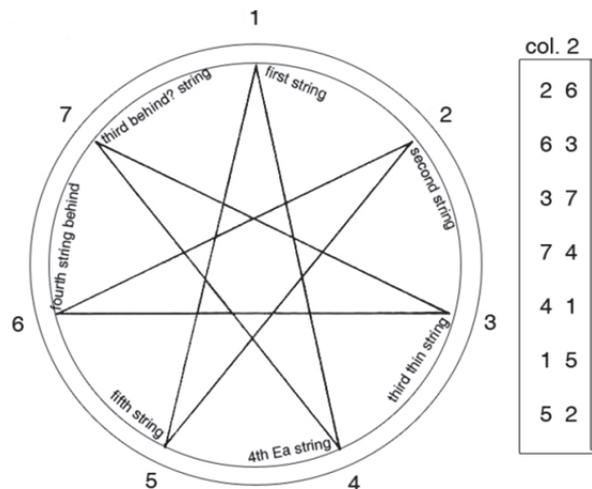


Fig. 61. Reconstruction of the essential elements of the text.

Any musicologist presented with a heptagram would conclude, should they be assured that the context is musical, that the figure is the diagrammatic construction of a heptatonic diatonic musical scale. They would expect to find numbers, notes, pitches or degrees on each of the points of the star, starting from the top, and then conclude that the intersecting lines linking the numbers indicate the alternation of intervals of fifths and fourths which are the basis for the formation of the diatonic heptatonic paradigm.

Should they wish to illustrate further the principle, they would draw a table with a series of numbers which would flow in the following sequence: 1-5-2-6-3-7-4-1, as complementary explanation of how the heptagonal construction works. Should they substitute notes for numbers, as they are displayed on the circumference, clockwise, then the notes could be any ascending or descending series starting on any note of the heptatonic scale: c-d-e-f-g-a, or b. It is therefore unsurprising that the names and numbers which appear on the heptagon in CBS 1766 are precisely what our music theoretician would have written, without hesitation, on a similar pattern. Indeed, the number at the top of the heptagon is 1 and its nomenclature is *qu-ud-mu*, meaning “first string”, unsurprisingly. The orthography diverges from UET VII 1267. There we have Sumerian *sa.di* with Akkadian equation *qud-mu-u[m]*. The second term, clockwise, is headed with number 2 followed by *sa-mu-šum*, close enough to *sa-mu-šu-um* in the same UET; the term which follows is not readable but it must have been *šal-al-šu qa-at-nu* since this is what follows in our text of reference; then we have *a-banu* rightly followed by *ha-an-šu* and *re-bi? ub-ri*. The sequence ends with number 7, *šal-šu [XX]*. The last signs resist reading but we would expect something expressing that it was the  $x^{\text{th}}$  behind-string, *i.e.*, the  $x^{\text{th}}$  last string as we have it in UET VII, 126. Now, that we have both the names of the strings as well as numbers on the heptagram is of high significance as this constitutes the first instance in the history of music of a dichotomy between the string itself and the sound it produces.

Thus the heptagram has both nomenclature and number. This is evidential of a system where we have a scale of the first degree, of the second degree, of the third degree, etc., starting on the first string, on the second, and so forth. The number of strings is now restricted to seven, depicting both heptachordal and heptatonical systems as basis for this new theory.

This text marks a radical change in music theory as it exposes a preference for the tonal rather than for the modal. Indeed, there is no mention of names of fifths or thirds which would be “proto-*ajnās*”, no more enneatonic scales related to the morphology of fifths, and perhaps of thirds that were revealed in older texts such as UET VII, 126 and 74.

The 29 tablets of which one only will be discussed in the present paper were unearthed during the pre and post war Missions at Ras Shamra conducted by the French scholar Claude Schaeffer. They are written in the Hurrian language with syllabic Babylonian cuneiforms and date from about 1400 B.C. The scribes who wrote these texts were Akkadians or Semites with Akkadian fluency

accounting for the Hurrianisation of the original Akkadian terminology.

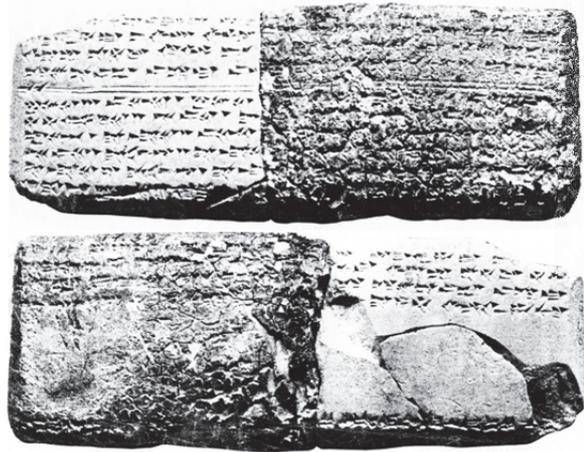


Fig. 62. Photograph of H.6. Courtesy of the Museum of Damascus.



Fig. 64. Hand copy by the author of the cuneiform text above.

The tablets, in all probability, would all have had the same rectangular shape to fit the length of the hand. The writing runs parallel to the longest side and is divided into three. The first part varies with each tablet but generally the text spreads onto the obverse. The text usually consists of one paragraph which ends by a double line, with a double *Winkelhaken*<sup>71</sup> at the beginning and at the end, on the obverse. The second part spreads below the double line and consists of Hurrianised Akkadian musical terms which are followed, in most cases, by a number and sometimes preceded, or followed, by a qualificative. The first part gives the verse and the second the music and rhythm. A colophon, which constitutes the third part, runs along the bottom edge of the tablets and states that it is... a song in the “mode” of “x” followed by a qualificative and deities to whom the hymn is devoted. Then follows the name of a scribe, a certain *Ammurabi*; another, *Ipšali* and the name of one of four Hurrian composers: *Tapšihun*, *Puḫiyanna*, *Urḫiya*, *Ammiya*.

Regrettably, the tablet which I am presenting here is the only tablet, reconstructed from three fragments, which came reasonably intact to us, H.6 = (R.13.30 + 15.49 + 17.387). For the purpose of this paper, I shall not discuss the upper register of the text because it

consists in the lyrics of the song which is of no particular importance in the present context.

The music part of the text which is inscribed below the double line has the text shown in Figure 65.

A first observation shows that each line includes six terms with the exception of line 6. However it is possible that a sixth expression existed at the end of this line because the surface is very damaged. It would be unreasonable to assume that this last term differs from the others simply because it is unreadable. Furthermore, that the other lines include 6 terms would tend to favour the presence of a sixth one there. Thus we may assume that each line included six terms as shown on Figure 66.

Each term is followed by a number with the possible exception of the fourth of the first line (5-IV); the last one in the first (5-VI); the last in the second (6-VI) and last in the tenth line (10-VI). However, the surface is damaged and there is no reason to assume that these terms were not followed by a number.

5. *qablite 3 irbute 1 qablite 3 rxx xxxʔ titimišarte 10 uštamari*
6. *titimišarte 2 zirte 1 šaḥri 2 zirte 2 irbute 2?*
7. *umbube 1 šaššate 2 irbute [1] šaššate 2? titarqabli 1 titimišarte 4*
8. *zirte 1 šaḥri 2 šaššate 4 irbute 1 nadqabli 1 šaḥri 2?*
9. *šaššate 4? šaḥri 1 šaššate 2 šaḥri 1 šaššate 2 irbute 2*
10. *kitme 1 qablite 3 kitme 1 qablite 4 kitme 1*

Fig. 65. Musical intervals and rhythm in H.6.

	I	II	III	IV	V	VI
5	<i>qablite 3</i>	<i>irbute 1</i>	<i>qablite 3</i>	<i>xxxxx</i>	<i>titimišarte 10</i>	<i>uštamari</i>
6	<i>titimišarte 2</i>	<i>zirte 1</i>	<i>šaḥri 1</i>	<i>zirte 2</i>	<i>irbute 2</i>	<i>xxxxx</i>
7	<i>umbube</i>	<i>šaššate 2</i>	<i>irbute 1</i>	<i>šaššate 2</i>	<i>titarqabli 1</i>	<i>titimišarte 4</i>
8	<i>zirte 1</i>	<i>šaḥri 2</i>	<i>šaššate 4</i>	<i>irbute 1</i>	<i>natqabli 1</i>	<i>šaḥri 2</i>
9	<i>šaššate 4</i>	<i>šaḥri 1</i>	<i>šaššate 2</i>	<i>šaḥri 1</i>	<i>šaššate 2</i>	<i>irbute 2</i>
10	<i>kitme 2</i>	<i>qablite 3</i>	<i>kitme 1</i>	<i>qablite 4</i>	<i>kitme 1</i>	<i>qablite x</i>

Fig. 66. Hypothetical reconstruction of the musical notation.



Fig. 65. The author's reconstruction of the music in H.6.

The colophon says that the piece is written in the “mode” of *nīdqībli*, the descending enneatonic scale D: E-D-C-B-A-G-F-E-D. Since all the surviving colophons of the collection indicate the usage of the scale of *nīdqībli*, to the exclusion of any other, it is possible that the series was composed in the same model. Therefore we can assume that *qablite* in the first line equated to A-(g-f-e)-D which is a descending fifth and that all other intervals in the text followed the same principle. The interpretation of the hapax legomenon *uštamari* has not yet been discussed but it could be assumed that it was a term for another interval, perhaps different from the fifth or the third and that it could also have been followed by a number. Since the tablets contain both text and music it makes little doubt that the musical notation was accurate enough to

match the exactness of the syllabic arrangement in the text. A less accurate rendition would have served no purpose.

Now, the tablet is the notation of a song. It says so in the colophon. There are no indications as to any form of instrumental accompaniment. As far as we know, the voice cannot produce dyads, simultaneously. This means that the intervals were filled in order to support the lyrics. Had the music been reduced to dyads, sung consecutively, the purpose for the nomenclature of fifths and fourths and their inversion would have had no purpose whatsoever. The contents of these filled intervals would have had specific melodic, and possibly, modal values.

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## Notes

<sup>1</sup> A *Modus vivendi* is an agreement between parties of diverging opinions. When two sides reach a *modus vivendi* regarding cultural incompatibilities, an accommodation of their respective differences is established for the sake of contingency.

<sup>2</sup> About the myth of Pope Gregory the First's ascribed reform: John the Deacon's complaint about Frankish barbarism comes from his biography of Gregory. St. Gregory compiled a book of antiphons using the contemporary term for a kind of liturgical singing. He founded a *schola* using the contemporary term for a choir which to this day performs the chant in the Church of Rome according to his instructions; he also erected two dwellings for it at St. Peter's and at the Lateran palace, where are venerated the couch from which he gave lessons in chant, the whip with which he threatened the boys, and the authentic *antiphonarium*, the latter being the great book containing the music for the whole liturgical calendar. See [Taruskin, 2010, Chapter One: The curtain goes up].

<sup>3</sup> *Mōdus*, i, m. root med-, measure, weigh; Gr. μέδομαι, μέδοντες, μήστορ, μέδιμος; cf.: modius, modestus, moderor, I. a measure with which, or according to which, any thing is measured, its size, length, circumference, quantity (freq. and class.). The measure of tones, measure, rhythm, melody, harmony, time; in poetry, measure, metre, mode: "vocum," Cic. Div. 2, 3, 9: "musicī," Quint. 1, 10, 14: "lyrici," Ov. H. 15, 6: "fidibus Latinis Thebanos aptare modos," Hor. Ep. 1, 3, 12: Bacchico exsultas (i. e. exsultans) modo, Enn. ap. Charis. p. 214 P. (Trag. v. 152 Vahl.): "fēbilibus modis concinere," Cic. Tusc. 1, 44, 106: saltare ad tibicinis modos, to the music or sound of the flute, Liv. 7, 2: "nectere canoris Eloquium vocale modis," Juv. 7, 19 – Fig.: "verae numerosque modosque ediscere vitae," moral harmonies, Hor. Ep. 2, 2, 144 (abbreviations of the names of authors and other abbreviations, signs, etc. can be found in [Smith, 1855, p. ix–xi]).

<sup>4</sup> [Picard, 2001].

<sup>5</sup> [Field, 1998].

<sup>6</sup> The earliest codex preserving ancient Greek music theory is *Heidelbergensis Palatinus* gr. 281. It was probably written in Seleucia on the west bank of the Tigris River, Mesopotamia (present day Iraq) by the scribe, Nikolaos Kalligraphos, and completed on January 14, 1040. The manuscript is preserved at Heidelberg University Library. The scribe's colophon states that "this book was assembled from many works among the private papers of Romanus, judge at Seleucia and my master. All you who read it, pray for him". The codex was conceived as a complete book; there are no blank leaves or sides. It preserves Psellus' complete Syntagma together with the preliminary Logices, and this is followed by his Opiniones de anima, a short excerpt from Leontinius on the hypostatases, Chapter 38 from Photius Quaestiones ad Amphilocheum, and ten short theological treatises by Theodore Abucara, an author represented in Arethas' collection of books. It is surely no coincidence that this codex preserves these particular works, which point back to libraries of the ninth century, as well as the work of Psellus. After Theodor Abucara, the codex includes the *koine hormasia* and an accompanying canon; three sections from Theon of Smyrna's treatise, here titled "Division of the Musical Canon"; a short explanation of the musical ratios and genera, part of which corresponds to section 103 of the so-called Bellemann's Anonymous, and a series of excerpts from Bacchius treatise... – see [Mathiesen, 1992]. The earliest surviving sources date from the 11<sup>th</sup> century and most are later. Accordingly, while it is still possible to trace the filiation of surviving sources through, at times, a fairly closed recension, the chronological gap between author and earliest source must be considered in dealing with the content of the material. Another concern is the large amount of musical material which

appears in works that themselves are not primarily musical in content; these works include not only general encyclopaedias, but also works of philosophy (Plato's *Timaeus* is perhaps the best-known case), poetry, drama, and other forms of literature. Finally, the existing catalogues of this source material have become outdated and remain lamentably incomplete. The only prior attempt to provide a complete index was compiled by Karl von Jan ([Jan, 1899]). It has been necessary to resort to individual library catalogues, listings of sources in other editions, scattered footnotes, and other diffuse channels to find sources needed.

<sup>7</sup> The *Suda* is a 10<sup>th</sup> century Byzantine encyclopaedia of the ancient Mediterranean world, formerly attributed to an author (erroneously) known as Suidas. It is an encyclopaedic lexicon written in Greek with 30,000 entries, many drawing from ancient sources which have since been lost, and often derived from medieval Christian compilers. The derivation is probably from the Byzantine Greek word "souda", meaning "fortress" or "stronghold", with the alternate name, *Suidas*, stemming from an error made by Eustathius, who mistook the title for the proper name of the author.

<sup>8</sup> By the end of the fourth century C.E., ancient Greek music theory was merely part of the residue of an ancient civilization and the distinctions among the traditions were blurred or forgotten. It remained for writers such as Martianus Capella, Boethius, and Cassiodorus – all of whom relied on relatively late sources – to preserve and transmit the little that remained to the Latin readers of the Middle Ages. Thus, later Greek writers such as Nicomachus, Ptolemy, Gaudentius, and Aristides Quintilianus represent both the final stages of Greek music theory in antiquity and, as filtered through their Latin interpreters, the first stages of ancient Greek music theory as it came to be known in the Middle Ages – see [Mathiesen, 2006], *in extenso*.

<sup>9</sup> However, the nature of some texts infers that the knowledge within may be sourced to far earlier times and it is my contention that embryonic music theory might have developed alongside numeracy before it expanded into literacy. Therefore I would argue that some form of music theory, probably the consequence of observation, would have been known in the fourth millennium B.C. This hypothesis is based on organological iconography and of its possible survival in nomenclature.

<sup>10</sup> In 1960, a young philologist, Anne Draffkorn-Kilmer, was given a tablet to study. It turned up to be a text with musical theory. This is how a philologist with no musicological background became the "leading expert" in that field. Whenever musicologists attempted at publishing their researches in Assyriological periodicals, they were rejected on the basis that it was not musicological material, and whenever the papers were proposed to musicological reviews, they were equally rejected, this time on the basis that it was Assyriological material. Thus musicology "proper" has been segregated from Assyriology for many years and it was only in 2008, at the first international conference of ICONEA (International Conference of Near Eastern Archaeomusicology) held at the British Museum and jointly organised by Richard Dumbrell (ICONEA) and Irving Finkel (Middle East Department of the British Museum) that for the first time musicologists and Assyriologists met at last, for a coherent discourse in that field.

<sup>11</sup> An agglutinative language is a language which uses agglutination extensively. Most words are formed by joining morphemes together. This term was introduced by Wilhelm von Humboldt in 1836 to classify languages from a morphological point of view. It is derived from the Latin verb *agglutinare*, which means "to glue together". In agglutinative languages, each affix typically represents one unit of meaning (such as "diminutive", "past tense", "plural", etc.), and bound

morphemes are expressed by affixes (and not by internal changes of the root of the word, or changes in stress or tone). Additionally, and most importantly, in an agglutinative language affixes do not become fused with others, and do not change form conditioned by others (see [Bodmer, 1972, p. 53]).

<sup>12</sup> Semitic languages are a group of related languages the living representatives of which being spoken by more than 270 million people across much of the Middle East, North Africa and the Horn of Africa. They constitute a branch of the Afroasiatic language family. The most widely spoken Semitic languages today are Arabic with 206 million native speakers, Amharic with 27 million, Hebrew with about 7 million, Tigrinya, 6.7 million, and Aramaic with about 2.2 million. Semitic languages are attested in written form from a very early date, with texts in Akkadian appearing from around the middle of the third millennium BC, written in a script adapted from Sumerian cuneiform. However, most scripts used to write Semitic languages are *abjads* — a type of alphabetic script which omits some or all of the vowels, which is feasible for these languages because the consonants in the Semitic languages are the primary carriers of meaning. Among them are the Ugaritic, Phoenician, Aramaic, Hebrew, Syriac, Arabic, and South Arabian alphabets. The Ge'ez alphabet, used for writing the Semitic languages of Ethiopia and Eritrea, is technically an abugida — a modified *abjad* in which vowels are notated using diacritic marks added to the consonants (according to [Bennett, 1998; Bergsträsser, 1995; Garbini, 1984] and others).

<sup>13</sup> Any object which is not adequately recorded during an academic archaeological excavation cannot be appropriately dated, and of course, located unless the object itself is explicit of both date and location, which is extremely rare. In the 19<sup>th</sup> century there has been a number of “grave robbers” who plundered and sold their bounty to often less than honourable “antiquarians”. These, in turn, frequently enhanced the objects by formidable descriptions. These objects were sold to wealthy private collectors keen on acquiring bits of the past, as was fashionable at that time. Most 19<sup>th</sup> century private collections are therefore unreliable (see note No. 26).

<sup>14</sup> [Galpin, 1937, p. 99–104].

<sup>15</sup> Scribal reliability is not attested, as far as we know, on any cuneiform tablet, i.e. there are no texts describing it. However, evidence of reliability and accuracy lies within the texts themselves. When scribes copied a tablet, they noted every detail of the original, that is where there had been an erasure, or where the tablet had been damaged or where part of it had broken away. They even replicated orthographic errors. There is a tablet in the Collections of the British Museum where the scribe had punched three quarters of the tablet with his stylus and written “broken”, “broken”, “broken”, etc., all over. This quality remained consistent throughout the usage of cuneiforms that is about three millennia.

<sup>16</sup> [Hilprecht, 1906]. Hermann Volrath Hilprecht was born in 1859 in Germany. In 1882, he spent two months in the British Museum studying cuneiform literature. He received his Ph.D. from Leipzig in 1883. In 1886 he left for the United States, where he became a professor of Assyrian at the University of Pennsylvania. He participated in the first campaign of excavations at Nippur, Iraq in 1889. With announcing the discovery of the Temple Library of Nippur after finishing the fourth campaign, some other team members including the former expedition director John Punnett Peters built a strong opposition against Hilprecht who claimed “the cream” of nearly every important discovery as his work. Some American orientalist joined in and the so called “Peters-Hilprecht-Controversy” was born.

<sup>17</sup> Bousquet, Margaux, forthcoming. See [Schiel, 1925]. Schiel was born on June 10, 1858, in Koenigsmacker and died on the September 21, 1940 in Paris. He was a French

Dominican scholar and Assyriologist. He was one of the discoverers of the Codex Hammurabi in Persia. He took courses of Egyptology and Assyriology at the École des Hautes Études in Paris. He then undertook a series of archaeological missions in the Middle East, and in Egypt.

<sup>18</sup> [Crickmore, 2013].

<sup>19</sup> *nabnītu* s.; 1. offspring, progeny, product, 2. habitat, place of growth, 3. living creature, 4. appearance, stature, features; MB, Bogh., SB; cf. [Roth, 1965].

<sup>20</sup> Sir Charles Leonard Woolley (17 April 1880 – 20 February 1960) was a British archaeologist best known for his excavations at Ur in Mesopotamia. He is considered to have been one of the first modern archaeologists, and was knighted in 1935 for his contributions to the discipline.

<sup>21</sup> [Kilmer, 1960].

<sup>22</sup> [Kilmer, 1965, p. 261–272].

<sup>23</sup> [Gurney, 1973].

<sup>24</sup> [Kilmer, 1960] *op. cit.*

<sup>25</sup> [Gurney, 1968; 1994; Vitale, 1982].

<sup>26</sup> This is one of the collections the origins of which are of uncertain provenance (see note No. 13).

<sup>27</sup> [Nougayrol, 1955; Schaeffer, 1955; Schaeffer, 1962a; Schaeffer, 1962b].

<sup>28</sup> A forerunner of Just Intonation since tonal quantifications in the regular numbers of the sexagesimal system are multiples of the sides of the right angle triangle.

<sup>29</sup> [Dumbrill, 2009].

<sup>30</sup> These text had not been published because scholars did not yet understand them and mostly consisted in U.7/80 and U.3011, which would later be known as UET VII, 74 and UET VII 126, respectively.

<sup>31</sup> In the Babylonian sexagesimal notation, the reciprocal of a regular number has a finite representation. Specifically, if  $n$  divides  $60^k$ , then the sexagesimal representation of  $1/n$  is just that for  $60^k/n$ , shifted by some number of places. For instance, suppose we wish to divide by the regular number  $54 = 2^3 \cdot 3^3$ . 54 is a divisor of  $60^3$ , and  $60^3/54 = 4000$ , so dividing by 54 in sexagesimal can be accomplished by multiplying by 4000 and shifting three places. In sexagesimal  $4000 = 1 \times 3600 + 6 \times 60 + 40 \times 1$ , or (as listed by Joyce) 1:6:40. Thus,  $1/54$ , in sexagesimal, is  $1/60 + 6/60^2 + 40/60^3$ , also denoted 1:6:40 as Babylonian notational conventions did not specify the power of the starting digit. Conversely  $1/4000 = 54/60^3$ , so division by  $1:6:40 = 4000$  can be accomplished by instead multiplying by 54 and shifting three sexagesimal places. In Babylonian music theory, the just intonation of a pitch set involves regular numbers: the pitches have frequencies proportional to the numbers in the sequence 24, 27, 30, 32, 36, 40, 45, 48, 54, 60, 64, 72, 80, 81, of nearly-consecutive regular numbers. Thus, for an instrument with this tuning, all pitches are regular-number harmonics of a single fundamental frequency. This pitch set is called a 5-limit tuning, meaning that the interval between any two pitches can be described as a product  $2^2 3^3 5^1$  of powers of the prime numbers up to 5, or equivalently as a ratio of regular numbers.

<sup>32</sup> [Hilprecht, 1906, p. 21].

<sup>33</sup> [Adams, 1902, v. VIII, p. 264–318].

<sup>34</sup> [Dumbrill, 2009], *op. cit.*

<sup>35</sup> “Dans une collection nous avons: ṽ igi x gal-bi, etc. traité par Hilprecht (Babyl. Exped., XX, 1, p. 22-29) et à sa suite par Pinches (Hilpr. Anniv. Vol., p. 71-78). Il nous semble que l'on peut donner à ces textes un sens plus obvie que n'ont fait ces auteurs. Pourquoi

↑ vaudrait-il 12.960.000 et non pas sa valeur documentée de 60. Rien n'oblige en lisant le quotient dans ↑ DA  $2/3 = \text{𐎠}$  de donner à chacun des quatre ↑ la valeur de 2.160.000, sinon la fiction que ↑ égale 12.960.000. Notre texte, en effet, qui n'est pas postérieur à Hammurabi distingue nettement entre les signes 𐎠 et 𐎡. Le premier se trouve dans la liste des diviseurs, rev. 4, 5, 6: *igi 𐎠 gal-bi, igi 𐎡 gal-bi, igi 𐎢 gal-bi, etc.*, où il ne peut se lire respectivement que pour 40,  $40 + 5$ ,  $40 + 8$ , - et dans la liste des quotients à la première ligne: ↑ da  $2/3 = \text{𐎠}$ . Le deuxième signe: 𐎡, se rencontre uniquement dans la liste des quotients, l. 8, 12, rev. 8, 10, 11. Le signe 𐎠 signifiant certainement 40 dans la liste des diviseurs, rev. 4, 5, 6, il est impossible que dans ce même texte, colonne voisine, le signe 𐎡 signifie 40 – de la même manière. Moins encore, l'expression du quotient 𐎠 de la ligne 1 peut-elle rien avoir de commun avec celle des quotients: 𐎡 𐎢 et 𐎣 𐎤 𐎥 de la fin du texte. On se rendra compte de cette diversité qu'en donnait à 𐎡 sa valeur fractionnaire *sinipu* =  $2/3 = 40/60$ , cf. Brunn. 10026, 10027; et sa valeur d'unités: 40 à 𐎠, signe que le scribe aurait aussi employé plus loin, s'il s'agissait d'unités majeures:  $600 \times 4$  ou  $36000 \times 4$  ou  $2160000 \times 4$ . Dès lors, si le quotient de la ligne 8, par exemple, est  $6 \ 40/60$  ou  $6 \ 2/3$  (dans le système décimal 6.666...) – il suit que le quotient de la première ligne est bien de 40 et que le dividende général de la table n'est point 12.960.000, mais simplement 60. Plus tard, les scribes confondront les deux signes et emploieront exclusivement 𐎡, sans gêner pour cela le calcul des contemporains. *A priori*, d'ailleurs, et sans soulever d'autres objections, est-il croyable que sur des tablettes d'exercices scolaires, et propres à être consultées comme modèles, des gens pratiques, tels que l'étaient les Babyloniens, se soient livrés à ce jeu de chiffres qui fait jongler avec des millions, milliards, trillions, etc.? En quoi cela pouvait-il faire d'eux des 'accomplished arithmeticians'? C'est une opinion fautive que dans les groupes de chiffres d'un produit, les derniers doivent toujours être des unités, les précédents des unités d'ordre supérieur, jusqu'à ↑ = 12.960.000 (et rien n'empêche de pousser au delà!) Pourquoi méconnaître que les Babyloniens connussent et sussent exprimer exactement ou approximativement à tout degré des fractions d'unités? Au lieu que, dans le système décimal, de la subdivision de l'unité principale en parties successives de 10 en 10 fois plus petites – résulte ce que nous appelons fractions décimales, ainsi dans le système sexagésimal usité par les Babyloniens, les opérations analogues donnent des fractions sexagésimales – non seulement dans les tablettes astronomiques à valeurs angulaires ou horaires, mais en général dans tout calcul."

<sup>36</sup> [Hilprecht, 1906, p. 25].

<sup>37</sup> In a private phone communication with Leon Crickmore.

<sup>38</sup> [Roth, 2010a].

<sup>39</sup> Babylonian and Assyrian gods were also known by numbers. Anu, the principal god was 60 or 1, since they counted in sexagesimal arithmetics; Enlil, was 50 and Ea, the god of music and of measure was 40 and also the god of two thirds. Sin was 30, and Shamash 20. There were other god complementing the system, for instance Inanna was represented by 15. We have here all the elements of a system based on just intonation. See [Dumbrill, 2005, p. 35; Labat, 1976, p. 243; Livingstone, 1986, p. 30–48] and [Röllig, 1995]; [Dumbrill, 2007].

<sup>40</sup> Scheil in [Mecquenem and Scheil. Mission de Susiane, 1935].

<sup>41</sup> Due to the italics used for the title, the term *nabnītu* is written here in standard font.

<sup>42</sup> The tablet appears in Ur Excavations Texts. Publications of the joint expedition of the British Museum and of the University Museum of the University of Pennsylvania, Philadelphia, to Mesopotamia. Volume VII, Middle Babylonian Legal Documents and other Texts. Oliver Robert Gurney. Note the lacuna in l.4, col.2 which was later corrected in IRAQ XLVI 82, note 1. Professor Gurney writes back to me on this matter on the 15<sup>th</sup> April 1996: "... I must have left the end of the line for a second look because it was dirty or otherwise difficult to read and then forgotten to come back to it. This happened to me several times!".

<sup>43</sup> Extracted from [Dumbrill, 2005, p. 27].

<sup>44</sup> In Old Babylonian, words in the singular have an ending on *-m*, typically *-um*, *-im*, *-am* respectively in the nominative, genitive and accusative case. This is called mimmation after the Semitic pronunciation *mim* of the letter m. It never carries the word accent. The mimmation is lost after the Old Babylonian period.

<sup>45</sup> [Dumbrill, 2005, p. 234–249]

<sup>46</sup> Here, the term "diatonism" is used *cum grano salis*, as it is of course impossible to say what was the tuning, or the tonal(?) system of an instrument from its iconographic representation. However, if one agrees that the strings would have had the same mass and the same tension, then it is possible to hypothesize that, for instance, the morphology of the large harps of the third millennium at Mari and elsewhere (See Dumbrill in the appendix to [Marcetteau, 2010, p. 73–75]). Therefore, the disposition of the string plan in our example here is more suited to "a form of" diatonism than it is suited to "a form of" anhemitonism. Quantifications for both diatonism and anhemitonism cannot be extrapolated and therefore remain assumptive.

<sup>47</sup> Line drawing by Higano, Yumiko, in [Dumbrill, 2005, p. 34, Pl. 6 & p. 246, Pl. 25].

<sup>48</sup> Line drawing by Higano, Yumiko, in [Dumbrill, 2005, p. 247, Pl. 26].

<sup>49</sup> In a recent verbal communication with Bruno de Florence, it was discussed that the musicians in this scene might not have played together, that is simultaneously, but perhaps consecutively, in a responsorial or imitation form. The lapicide would have decided to depict both musicians playing rather than one and not the other, waiting for his turn. Here the term dissonance must be taken cautiously as it is impossible to qualify dissonance without knowing to what system the term refers to. However, in the case of some form of anhemitonism and in relation to the practice in particular ethnomusicological contexts, notably in the Cameroon, it can be construed that anhemitonism is more suited to "natural or just" consonance – see [bakabeyond, 2009], etc.

<sup>50</sup> See [Manniche, 1991, p. 91, 54].

<sup>51</sup> Although Amorite iconography has evidence of anhemitonism in its instrumentarium. See Dumbrill's appendix to [Marcetteau, 2010].

<sup>52</sup> Catalogue of the Babylonian Section of the collection of cuneiform texts of the University Museum of the University of Pennsylvania, Philadelphia (unpublished).

<sup>53</sup> Author's photograph with kind permission of the University Museum of the University of Pennsylvania.

<sup>54</sup> [Kilmer, 1960].

<sup>55</sup> The word "unison" refers to two notes either of the same frequency or distant by one or more octaves from each other. It is the simultaneous execution of one polyphonic part by more than one performer or performing group (e.g. the first violin section of an orchestra), either at exactly the same pitch or at the interval of an

octave, double octave etc.; such execution is said to be “in unison” and is often indicated in scores by the Italian *all'unisono* (see [Wikipedia Contributors, 2012]).

<sup>56</sup> SA is a Sumerogramme which translates as *pitnu* in Akkadian: *pitnu* s.; 1. string of a musical instrument, 2. (a stringed musical instrument); [LÚ].NAR *ina pi-it-ni* [...] the musician on the *pitnu* [praises you] – see [Roth, 2005].

<sup>57</sup> [Gurney, 1968].

<sup>58</sup> This is a cast of the original tablet which has been returned to the Iraqi Museum in Baghdad in the 70s. Whether the tablet has survived the two wars (Iraq 1991 and 2003) is not yet known.

<sup>59</sup> [Vitale, 1982].

<sup>60</sup> [Gurney, 1994].

<sup>61</sup> In linguistics, a *protasis* is the subordinate clause (the if-clause) in a conditional sentence. For example, in “if X, then Y”, the *protasis* is “if X”. The other clause (“then Y”) is called the *apodosis*. In logic, the *apodosis* corresponds to the consequent, the *protasis* to the antecedent.

<sup>62</sup> [Hagel, 2009].

<sup>63</sup> Didymus introduced a distinction in the diatonic tetrachord between a major and minor whole tone (respectively 9:8 and 10:9). The major and minor whole tone together constitute a major 3<sup>rd</sup> (5:4), previously found only in the enharmonic tetrachord of Archytas; and in including a major 3<sup>rd</sup>, the diatonic tetrachord of Didymus resembles the upper or lower tetrachord of the modern major scale (e.g. C–D–E–F, or G–A–B–c. This tetrachord was adopted by Ptolemy, but with the positions of the major and minor whole tones reversed, as his “tense” diatonic tetrachord. The difference between the major and minor tones (9:8 × 9:10 = 81:80) is known as the “syntonic comma”, or “comma of Didymus”; this is also the difference between the Pythagorean major 3<sup>rd</sup> (81:64) and the pure major 3<sup>rd</sup> (5:4).

<sup>64</sup> See [Roth, 2010b]. I render occurrences of it as *sammû*-instrument, because in my opinion based on organological evidence, during the old-Babylonian Period there were no lyres fitted with as many as nine strings. However, there is ample evidence that vertical harps, during the same period, were fitted with as many as nine strings. (For a comprehensive description of lyres and harps during the periods mentioned, see [Dumbrill, 2005]) Additionally, a harp in which strings are better proportionated to a diatonic scaling would be a better instrument for the application of the instructions in this text, rather than a lyre where the strings have little variation in length. Therefore the *sammû*-instrument should be a “harp”. The reason for my decision not to translate *sammû* with “harp” is that in *UET VII*, 74, it is written with Sumerian <sup>85</sup>ZÁ.MÍ, <sup>86</sup> being the determinative for “wood” indicating of which predominant material the instrument was built) and that this might indicate a Sumerian origin for the instrument under scrutiny which therefore would be a lyre rather than a harp.

However, it might possible be that the scribe, for some unexplained reason, had opted for the usage of Sumerograms on that occasion for reasons that are obscure, but not uncommon.

<sup>65</sup> See [Roth, 1961]. It is highly probable that the Old-Babylonian did not have a proper musicological term for describing the tritonic dissonance. This is perhaps because it could be found either in the fifth or in the fourth. However, the term with the negative *la*, clearly means “unclear”, “not pure”, etc., and is sufficient to indicate a tritonic dissonance in the present context.

<sup>66</sup> The term “dyad” is used by Kilmer to imply that in any interval know in the Sumero-Babylonian nomenclature, only the first and the last note is sounded. This remains her postulation.

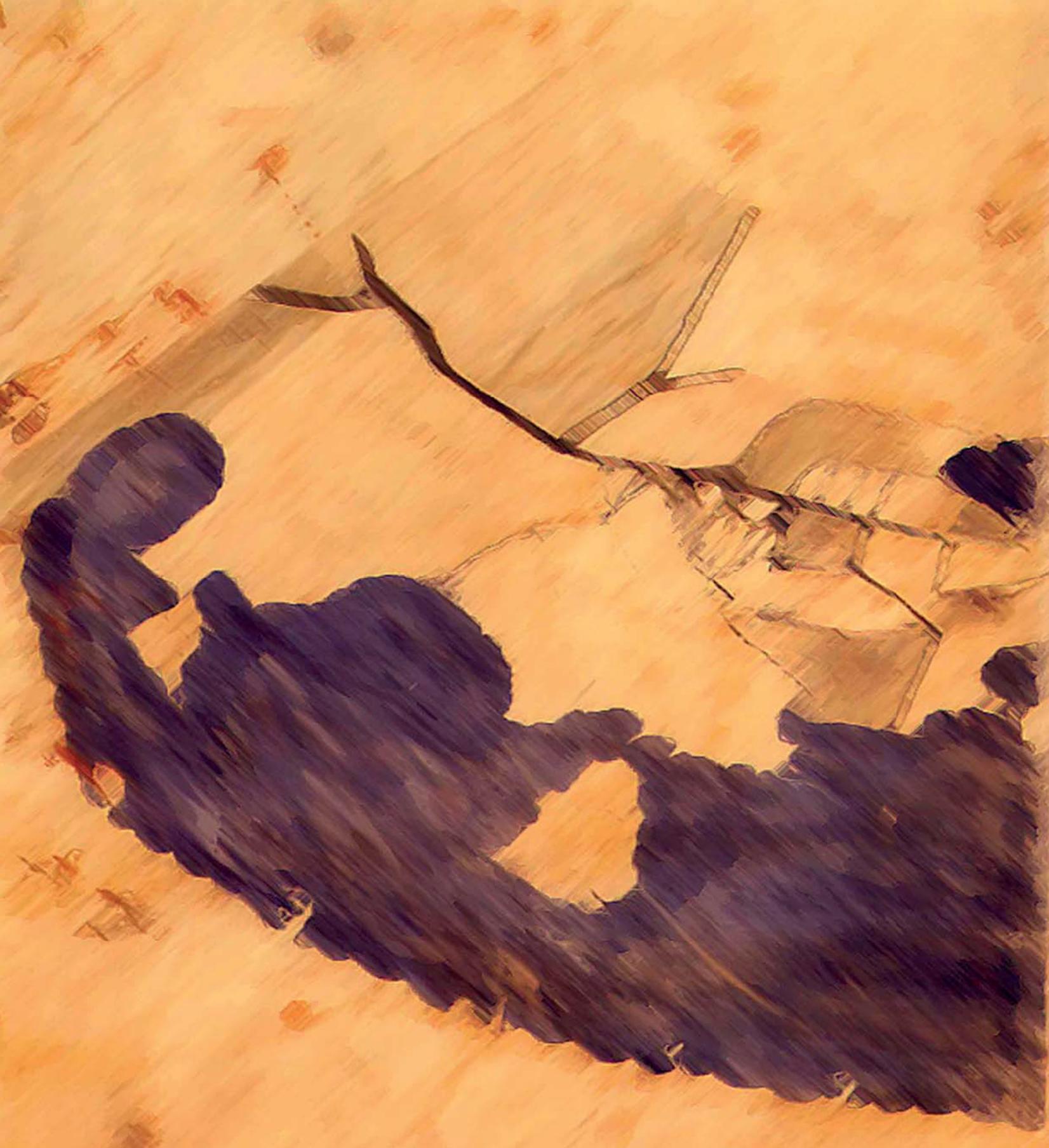
<sup>67</sup> Trichords are sets of 3 notes, tetrachords are sets of 4 notes, and pentachords are sets of 5 notes. The Arabic word for these sets is *jîns*, plural *ajnâs*, which means the gender, type or nature of something. In case of pentachords, the word *‘aqd*, plural *‘uqûd*, is also used. These sets are the building blocks for Arabic *maqâm*(s). It is possible and often practical to view a *maqâm* as a collection of sets, as well as a collection of notes. Each *maqâm* is made up to two main *ajnâs* (sets) called lower and upper *jîns*. The lower *jîns* is used to group or classify the *maqâm* in a family. In general the starting note of the upper *jîns* is called the dominant note. A *maqâm* also includes other *ajnâs* (called secondary) which overlap the two main *ajnâs*, and can be exploited during modulation. Different Arabic music references define sets slightly differently. As with *maqâm*(s), many sets are too archaic or rarely used. There is also disagreement about the length of each set (3, 4, or 5 notes), and some references simplify and standardize every set as a tetrachord. In general all sets are defined as tetrachords unless there is a good reason not to. A set is defined as a trichord when the next (4<sup>th</sup>) note is impossible to predict out of multiple choices, as in the *Sikâ* and *Musta‘âr* trichords for example. Another reason to define a set as a trichord is when 3 notes are enough to convey its melody or mood. An example of this are the *‘Ajam* and *Jahârkâ* trichords. Complex sets (containing other partial sets) are defined as pentachords, as in *Nawâ-Athar* and its variation *Athar-Kurd* for example (see [Maqam World, 2004]).

<sup>68</sup> On the basis of their structure as each interval of the fifth is different.

<sup>69</sup> In general, a heptagram is any self-intersecting heptagon, a seven-sided polygon. There are two regular heptagrams: 1) the 7/2 heptagram and 2) the 7/3 heptagram. It is the 7/3 heptagram which is depicted in CBS1766. This is the smallest star polygon that can be drawn in two forms, 7/2 and 7/3, as irreducible fractions.

<sup>70</sup> [Dumbrill, 2008]; [Friberg, 2008]; [Horowitz, 2006].

<sup>71</sup> The *Winkelhaken* (German for “angular hook”, also simply called “hook” in English) is one of five basic wedge elements appearing in the composition of signs in Akkadian cuneiform. It was realized by pressing the point of the stylus into the clay.



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