

Matters on Musical Proportions: 15th Century Hebrew Class-Notes on Notation and Counterpoint

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Abstract. It is commonly believed that, with the exception of the Geniza fragments written by Obadiah the proselyte, there is no evidence of Medieval Jews practicing any form of music notation. The anonymous Florence manuscript Magl. III: 70, dating ca. 1450, constitutes a very rare example of the opposite. It contains class notes and diagrams written in Hebrew with a remarkable number of loan-words from local languages. These class-notes deal matters of notation and basic counterpoint. The present article offers a full annotated translation of the fragment, together with some suggestions for further research on the almost unknown role of music education in medieval Jewry, as well as on the influence of French music theorist Jean Vaillant.

Keywords. Anonymous Florence, Jean Vaillant, Ars Subtilior, Medieval Music Theory, Hebrew, Jews, Provence, Judaeo-Catalan, Counterpoint.

Resumen. Con excepción de los fragmentos de la Gueniza del Cairo pertenecientes a Abdías el Converso, la opinión mayoritariamente aceptada es que los judíos medievales no practicaban ningún tipo de notación musical. El manuscrito anónimo florentino Magl. II:70, datado alrededor de 1450, constituye un raro ejemplo de lo contrario. Contiene notas de clase y diagramas escritos en hebreo, con un importante número de préstamos léxicos catalanes, latinos y de otros idiomas. Dichas notas tratan de temas relativos a la notación musical y el contrapunto básico. El presente artículo ofrece una traducción anotada completa de este manuscrito, junto con algunas sugerencias para investigaciones posteriores, en campos tales como la prácticamente desconocida función de la educación musical entre los judíos medievales y la influencia del teórico musical francés Jean Vaillant.

Palabras clave. Anónimo de Florencia, Jean Vaillant, Ars Subtilior, Teoría musical medieval, Hebreo, Judíos, Provenza, Judeo-Catalán, Contrapunto.

Jews and Music Notation

One of the complicating factors in the study of ancient and medieval Jewish music is the fact that this tradition lacks of a “tone-script” in the European sense

of the term: the Jewish music lore never developed a univocal code of notation (one symbol = one sound). Even in when a few local Jewish communities adopted notation codes (such as in Eastern Europe), this did not happen until relatively recent times. Ancient and Medieval Jewish music theory never dealt with scales, modes or rhythms, but rather with the mystical aspects of music and, particularly, with the grammar, use, and meaning of Biblical cantillation signs¹. However, in spite of their universal use throughout the Jewish world, these trop marks never defined actual pitches, but rather melodic shapes and patterns that widely varied from country to country.

Here and there we find few and spurious instances of early notation applied to Jewish music. Until the creation of Jewish art music by Salamon de Rossi (1570-1630), it is uncertain if Jews did know or use European notation systems at all. Notated sources are very scarce, and always transmitted by authors of non-Jewish origin. In the 12th century Obadiah the Norman Proselyte notated two hymns,² discovered at the Cairo Geniza³. This early example was, nevertheless, produced by a Catholic priest converted to Judaism, and as such, his skills were not indicative of the degree of music-notation knowledge among Medieval Jews. Obadiah must have received his music education in a Christian context. Other than Obadiah's manuscript, several non-Jewish German humanists transcribed the melodic patters of Biblical chant in the 16th century, Reuchlin⁴ being the best known of them. Between the 16th and the early 19th century, a dozen of non-Jewish authors copied or recreated similar experiments, thus adding very few original materials to the corpus. Among these we find Athanasius Kircher, and Giovanni Battista Martini⁵. It is uncertain if the "Jew parodies" found in some Renaissance and baroque composers actually derived from common Jewish

¹ For an example of cantillation theory writing almost contemporary to manuscript Magl. III:70, see my article «Teoria musical i del so en el pensament de Rabí Durán», [Acoustics and music theory in R. Shimon Duran's thought]. Bugar, Mallorca: Fundacio ACA, *Estudis Musicals*. vol. 12, 2005, pp. 67-92.

² Shortly after their discovery, these rare manuscripts, oldest example of Jewish music notated ever found, were profusely studied. See I. Adler, *Revue de musicologie* 51, 1965, pp. 19–51; H. Avenary, in *Journal of Jewish Studies* 16, 1966, pp. 87–104; N. Golb, *Ibid.* 18, 1967, pp. 43–63; A. Scheiber, in *Hebrew Union College Annual* 39, 1968, pp. 163–75.

³ For a short introduction to this subject, cf. HOROWITZ, Yehoshua, et al.: "Genizah, Cairo." *Encyclopaedia Judaica*. Ed. Michael Berenbaum and Fred Skolnik. 2nd ed. Vol. 7. Macmillan Reference USA, Detroit, 2007. pp. 460-483.

⁴ Johannes Reuchlin (1425-1522), Hebraist and one of the architects of Christian Kabbalah. Cf. SCHOLEM, Gershom: *Die Erforschung der Kabbala von Reuchlin bis zur Gegenwart*, Pforzheim: Im Selbstverlag der Stadt 1969; idem, *Bibliographia Kabbalistica*, Schocken Verlag, Berlin, 1933, pp. 126ff; Max Brod, *Johannes Reuchlin und sein Kampf*, Stuttgart, Kohlhamme 1965.

⁵ For a non exhaustive list of these examples, see BAYER, Bathja, et al.: "Music", in *Encyclopaedia Judaica*. Ed. Michael Berenbaum and Fred Skolnik. 2nd ed. Vol. 14. Detroit: Macmillan Reference USA, 2007, pp. 636-701.

music practice⁶. We will have to wait until 1740 for the first cantorial manual, written by Judah Elias of Hanover.

In this context, it is easy to see why the anonymous Florence manuscript (Fn Magl. III, 70) constitutes an exciting rarity⁷. It contains a short series of class notes on notation and basic counterpoint, written in Hebrew in mid 15th century. It constitutes an unusual proof of a Medieval Catalan Jew engaged on music theory learning, most probably in a non-Jewish educational institute, or at least under a non-Jewish tutor.

The manuscript and its use of language

The Anonymous Florence is part of a larger binding, containing the presently analyzed text (fols. 1a-4b), a series of notation exercises (fols. 14a-15a, bound upside down), and a text that mingles practical Kabbalah and folk medicine (fols. 5a-13b, and 15b). There is no indication of the name of its author, although a much later note on the fly-leaf attributes the authorship to a Daniele Hazan. This name cannot be found in the texts and does not correspond to any historically documented person.

The manuscript is written in Hebrew, although it includes an important amount of loan words from several languages, always transliterated to the Hebrew alphabet. Both the beginning and the end of the manuscript are missing. It was clearly written by a single hand in 15th century Provençal script. Although its watermarks have not been identified, they are similar to Briquet 4360 (Perpignan, 1453) and Briquet 13293 (Cavaillon 1461). The mid-15th century dating of the Anonymous Florence is supported by the aspect of its musical examples, written in white notation. According to Adler⁸, the manuscript contains elements common to another mid-15th century Provençal manuscript, the Anonymous IX⁹. Both sources do not make mention to values smaller than a *minima*.

⁶ Bathia Bayer is currently researching medieval and post-medieval culture-contacts in Western Europe, particularly Judeo-German song contrafacta, as well as hidden sources in “Jew parodies”.

⁷ The manuscript was transcribed and published by Israel Adler on RISM (*Hebrew Writings Concerning Music in Manuscripts and Printed Books, From Geonic Times up to 1800*, by I. Adler, Munich, G. Henle Verlag, 1975, LVIII, pp. 55-77 - RISM B IX[2]), together with facsimiles of all the folios. I am grateful to Dr. Antoni Pizà of the Foundation for Iberian Music for introducing me to this text; and to Dr. Ann Stone (CUNY) for her suggestions and invaluable help.

⁸ RISM, p. 57.

⁹ The manuscript in question is the CS III Anonymus XI, published by E. de Coussemaker in *Scriptorum de Musica Medii Aevi*. Paris, 1864. The 13 intervals of Section 13 are parallel to the 13 “modes” and the 13 “mode simplices” of Anonymous IX (Coussemaker pp. 422-425, 470b). The same could be said about the twofold enumeration of eight proportions on Section IV (parallel to Coussemaker, pp. 471-475), and the sign indicating *sesquioctava proportio* on Section V (common to Coussemaker, pp. 473).

One of the main difficulties of this text resides in its extremely concise –and often careless– Hebrew style, and in its continuous use of transliterated non-Hebrew words. A close look to these loan-words reveals that the biggest part of them is Catalan, which would be indicative of the author’s native tongue. Judging by the dialectal characteristics and references to *Ars Subtilior*, the classes or lectures must have taken place somewhere in Provence, perhaps in Avignon. It is unclear in what language were the lectures delivered. Due to the close similitude between Catalan, French, and Occitan (together with the added difficulty of using a Semitic, non-voweled alphabet), we often wonder if the spelling hesitation corresponds to the use of different languages or rather to the author’s lack of transliteration coherence. For instance, when talking about prolations, the author alternates the spelling *prwlsyw* (corresponding to the Catalan *prolació*) with *prwlsywn* (that is, French *prolation*), and *prwltsyo* (reflecting the Ecclesiastic Latin pronunciation of *prolatio*).

In any case, the author was a frontier person, a native Catalan who also spoke Occitan and French, and had at least some knowledge of the Latin language (although he never uses the Latin alphabet). The author’s Hebrew is fair but not brilliant: he often struggles to find the right translation of a word, uses very imprecise terms, and occasionally even violates grammatical rules. In the light of his lexical and syntactic choices, he may have had a limited Hebrew education. Perhaps he had to flee Catalonia-Roussillon, whose Jewish community was waning fast, immerse in the decline between the riots of 1391, the civil war, the establishment of the Inquisition, and the total expulsion of 1492-93. As a contrast, the Jews in Provence were enjoying an extremely favorable period. Both Queen Yolande and King René were favorable to the Jews. In 1454 King Rene authorized the admission of Jews to all forms of commerce, trade, and craft. At that time, Avignon and the Papal states still had a thriving Jewish community and an impressive cultural life¹⁰. In Provence, the author of the manuscript may have easily found welcoming venues for music education.

The often puzzling hybridization of languages and the somehow neglected Hebrew style prove that the manuscript essentially contains personal notes, probably taken *in situ*. It certainly lacks of the literary formulas and formal style

¹⁰ There is a very interesting article on the neighboring community of Tarascon, written by ROUX, Claude: “La communauté juive de Tarascon au XVe siècle”, in *Revue des Etudes Juives* 167, nos. 3-4, 2008, pp. 511-569. For a general introduction to the historical context of the manuscript, see BLUMENKRANZ, Bernhard and LEVITTE; Georges: “Avignon”, in *Encyclopaedia Judaica*. Ed. Michael Berenbaum and Fred Skolnik. 2nd ed. Vol. 2. Detroit: Macmillan Reference USA, 2007. pp. 733-734. BLUMENKRANZ, Bernhard, and SHAPIRO, Alexander: “Provence”, in *Encyclopaedia Judaica*. Ed. Michael Berenbaum and Fred Skolnik. 2nd ed. Vol. 16. Macmillan Reference USA, Detroit, 2007. pp. 636-639.

we would expect in copied manuscripts. On occasion, the author uses imprecise Hebrew equivalents to certain terms. This is the case of the multilingual hesitations on Section ii: 21ff. There is, however, a strange change of tone on section iv, as we reflect in the translation and accompanying footnotes. In any case, even when he tries to write in a pompous, literary fashion, the author's Hebrew is inaccurate and of poor literary quality.

Most of the etymological explanations that the author gives in order to explain the meaning of terms are, to say the least, *sui generis*¹¹. It is impossible to know if some of these fantastic etymologies are fruit of his own lucubration or if he is merely transmitting common popular etymologies received from his instructor.

Contents and interest of the manuscript

The content of the Anonymous Florence is eclectic and not solidly structured. Section I is fragmentary, dealing with permitted melodic intervals. Section II offers a definition of counterpoint, lists the twelve species of consonances, and describes the melodic intervals. On Section III the author exposes some elementary rules of counterpoint on permitted series of consonances and resolution of imperfect consonances. Section IV deals with proportions and their notational devices. Section V comes back to the consonances, and explains the prolations. Section VI concludes the remnant proportions and their notation. Section VII is a *totum revolutum* of various matters regarding notation.

Perhaps the main interest of Anonymous Florence resides its references to known sources (Jean des Murs, Guido d'Arezzo, Galiot's ballad "Le sault perilleux, etc), and particularly to the teachings of Jean Vaillant¹², quoted up to five times in the text and respectfully presented as the main authority.

Vaillant was a late 14th century French composer who had a music school in Paris around 1360-1390, and probably served John, the Duke of Berry, a significant patron of musicians in the 1380s and 1390s. Due to the fact that Jean Vaillant's name is not uncommon, there has been some controversy regarding his identity. There was a *clerc des offices de l'ostel* in the duke's retinue in 1377, and a *secretaries ac custos sigilli* with the same name in 1387. In 1356 Innocent VI named a Johanni Valhant as chapel singer. There is also a poet from the Poitou who bears the same name, and composed an *Abrege du Roman de Brut* for Louis de Bourbon in 1391. Another Jehanin Vaillant was a singer in the chapel of Queen Isabeau in 1401¹³.

¹¹ Cf. Section II: 1-2; 10-11, among others.

¹² Alternatively spelled in the text as *Violant*, *Valent*, or *Valant*, in part due to the difficulty of representing diphthongs in Hebrew script.

¹³ See GÜNTHER: "Die Musiker des Herzogs von Berry," in *Musica Disciplina*, no., 17, 1963, pp. 82-84; and Wright, Craig. *Music at the Court of Burgundy, 1364-1419: a documentary story*. Henryville, Pa: Institute of Medieval Music, 1979, p. 82 note 211.

In any case, the Jean Vaillant that appears in the manuscript Chantilly was a poet-composer mentioned in the anonymous treatise *Les règles de la seconde rhétorique*, ascribing him to the post-Machaut generation and adding that he ran a music school in Paris, as corroborated by our manuscript. Yolanda Plumley¹⁴, who mentions the Anonymous Florence in relation to Jean Vaillant, indicates that the manuscript shows evidence of Vaillant's use of *Le saut perilleux*, which survives uniquely in Chantilly 564. Other than these details, the codex Chantilly offers further evidence of Vaillant's connection to Paris and his pedagogic activities¹⁵.

Vaillant wrote a virelai imitating birdcalls, *Par maintes foys*, which was quite popular and widely transmitted in his time. The same virelai provided the music for a contrafact composed by Oswald von Wolkenstein (1376-1445). Jean Vaillant has five pieces in the Chantilly manuscript and, according to Garber, his style retains more of the clarity and simplicity of Guillaume Machaut than does that of some of his contemporaries¹⁶.

In a very interesting¹⁷ Dr. Anne Stone notes the importance of the Anonymous Florence in order to shed light on the Ars Subtilior study and practice in Paris, in spite of the fact that this manuscript is somehow obscure, written up to a century after Vaillant in a geographically distant context, and has suffered several linguistic permutations¹⁸. Interestingly enough, the manuscript reverently talks about Vaillant in the present tense, as a living authority, a detail that for Stone suggests straight line of pedagogical ancestry¹⁹.

Another interest of the anonymous Florence resides in its inclusion of abundant Catalan terms, whose detailed lexicographic study can contribute to the relatively small corpus of literature in Judaeo-Catalan. Also known as Catalanic or Katalanit, this was a Jewish language spoken mainly in Catalonia and the Balearic Islands, and it reached its golden age between the 12th century and the

¹⁴ PLUMLEY, Yolanda: "An 'episode in the south'? Ars subtilior and the patronage of French princes", in *Early Music History: Studies in medieval and early modern music* (vol. 4). Iain FENLON. edit., Cambridge University Press, 2009, pp. 127ff.

¹⁵ After Vaillant's rondeau *Dame doucement* in the codex, there is a note that states "compilatum fuit parisius anno domini MCCC sexagesimo nono." See Plumley: *ibid*, p. 128.

¹⁶ GARBER, Benjamin: "Minor Composers (14th century)", in *Medieval France: an encyclopedia*, William W. Kibler, edit. Garland, 1995, p. 247.

¹⁷ The prevalent opinion has been that the Ars Nova is a product of Parisian life, while the Ars Subtilior is substantively a southern phenomenon. Following Ursula Günther's ideas, Stone proves the connection of the Ars Subtilior to the Paris scene.

¹⁸ STONE, Anne: "The Ars Subtilior in Paris", in *Musica e Storia*, vol. 10, no. 1, 2002, pp. 373-404 I agree with Stone's statement that "if these are student notes, we might speculate that the student was not terribly attentive"!

¹⁹ *Ibid*, p. 386.

riots of 1391. Linguistically, it is very close to Judaeo-Provençal, also known as Shuadit, although both human groups were politically, historically and ethnically quite different. Very often it is difficult to determine if the author is in fact using Shuadit or Katalanit, a problem complicated by the absence of vocalic marks.

Translation criteria

This article contains a full annotated translation of the text. It has not been our goal to discuss how “wrong” or “right” was the author in matters of music theory. The text is often ambiguous and allows several possible translations. We noted only the more blatant of these cases, and we will certainly welcome any inquiries and comments from the Academic community as of other possible solutions. The division by sections and lines follows Adler’s edition. The same can be said of all the references to graphic symbols, in which case we added footnotes that point to a particular section of the facsimile published on RISM. Our paleographic research on the facsimile has been minimal. Although we note a few times where our translation contradicts Adler’s transcription of the manuscript, in general we follow his paleographic interpretations.

Due to the multilingual characteristics of the text, it would be very tempting to introduce a high number of non-English terms. However, we sacrificed some accuracy in order to make a more readable translation, and we kept foreign terms to a minimum. At the end of each section, a foot note will list the loanwords used in the section, easily allowing the tracking down of equivalents.

Suggestions for further research

Our translation of the Anonymous Florence is, in many ways, unpolished stone, a tool whose purpose is to bring the text near to researchers lacking the necessary knowledge of the Hebrew and Catalan languages. On a closer reading, there are a certain number of subjects that surely deserve further research.

One of them is the intriguing connection of the manuscript with English music practice, concerning the use of ink colors other than red, a rarity already pointed out by Stone and reflected in our translation’s footnotes. Furthermore –and in spite of the often mistaken and obscure quotations- we think that it could be interesting to look closely at the relationship of the manuscript not only to Vaillant, but also to Des Murs, and to “Guido,” whose identity is somehow controversial as well. In certain fragments, it seems evident that our manuscript is actually quoting other authors and sources yet to be identified.

A further analysis of the Catalan loanwords should be put in perspective with the corpus of Catalan music terminology, particularly that of documents and literature south of the Pyrenees, in order to establish if there are any lexical elements that are particularly defining of a Judeo-Catalan dialect.

If we are to trust the cohesion of the Anonymous Florence manuscript binding, a study of the rest of the manuscript may help narrow down the author's identity, perhaps through an analysis of the Kabbalistic doctrines in the second tractate (whether influenced by Castilian, Provençal, or south-Catalan authors from the Girona scene), or perhaps through the author's approach to medical science.

Annotated translation of the Anonymous Florence manuscript

Section I

[...] indicating four times, then they are seven: tone, semitone, ditone, semiditone, diatessaron, diapente, diapason. This is what some authors say, because this is a consonance, [a term] which designates a number of different notes that sound together well, even if they are in fact different²⁰. One needs to delay [...]²¹.

Section II

[1-2] It is important to know what counterpoint is. A counterpoint is the setting of the *discantus* in relationship with the tenor.²² The word *contrapunt* (counterpoint) comes from *cum* (with)²³, meaning that both elements are suitable to go together. *Punt* (point), which also means "measure", alludes to the fact that counterpoint has to be sung with measure. This reminds us of the popular saying that states that anything without measure leads astray.

²⁰ Here the manuscript shows a bigger gap than usual, further marked by two vertical lines, which probably mean that this concludes a lesson on permissible melodic intervals.

²¹ As explained in the introduction to this article, due to the high amount of non-Hebrew words used in the text, we translated everything to English and then listed all the loanwords at the end of each section. Occasionally, we decided to leave some loanwords in the text for the sake of readability. Unless noted, terms are exclusive and always appear as the sole tag for a concept. The loan words in section I are *semitó*, *ditto*, *semiditó*, *diatèsson*, *diapente*, *diapason*, *consonància*. All are Catalan terms written in Hebrew characters. Some of them are of Greek origin, but profusely used in Medieval Catalan.

²² The word we translated here as "discantus" is in fact *davar* ("thing"). This alludes to is the melody that accompanies the *tenor*, a term that at this point in time designates the cantus firmus. Before the 1100s the cantus firmus usually was in the top voice (cf. *Musica Enchiriadis*, ca. 900), but later it was moved to the lowest voice and later to the tenor.

²³ Adler thinks that *acum* is just a wrong transliteration of the Latin "cum" ("with," RISM p.59). It is not clear why through the text the author occasionally adds an aleph as a prefix to some words, since it cannot transcribe any possible grammatical particle, Catalan or else. This happens only in front of some Latin and Greek transcribed words, never with Hebrew or Catalan terms. Although one may think that the use of this extra initial aleph could be a mistake produced by transcribing some *circellus* or other graphic mark, in my opinion the author adds the extra aleph in order to avoid confusion between the Latin *cum* and the Hebrew *kum* (to stand up), which would be identically spelled. A similar argument could be made regarding the Greek prefix *di* and the Hebrew *dai* ("enough"). Another, less likely possibility is that here *acum* corresponds to a Catalan word meaning "discernment, subtlety of understanding," (cf. Alcover-Moll), a cognate to the English *acumen*, although the context does not seem to imply it.

[3-9] How many kinds of counterpoint are there? Some experts say that there are seven, and some say thirteen. There is a variety of opinions about that. However, in reality the number of kinds of counterpoint varies according to how high a person's voice can go up or how low he can go down²⁴. Certainly, according to the modern experts, there are 12 kinds: unison, third, fifth, sixth, eighth, tenth, twelfth, thirteenth, fifteenth, seventeenth, nineteenth and twentieth. What is a unison? An example of unison would be Ut Ut²⁵, Re Re, etc. It is called like that because diverse notes "unite" and become just like one note. Semitone is like the distance between Mi and Fa, and the prefix *semi* means half. A tone is the distance between Ut and Re, or Re and Mi, for instance. This term derives from the word *tonar*, which means to produce a sound.²⁶ Semitone is Re Mi Fa. The term comes from "tone" and the prefix *semi*, because it is constituted by a tone and a semitone. We can also call it a minor third.

[10-11] An example of ditone is Ut Re Mi, or Mi Re Ut. The term comes from the prefix *di* and the word "tone", since it is composed of two tones. A diatessaron is, for instance, Ut Re Mi Fa or Fa Mi Re Ut. The word comes from the prefix *dia-*, meaning "tone," and *tessaron*, which means "four." It can also be called a minor fourth²⁷.

[12-13] The tritone²⁸ is found, for instance, between Fa Sol La-Re Mi, or Mi Re Do-Sol Fa.²⁹ It is called like this because *tri-* means three, and therefore it contains three tones. Diapente is Ut Re Mi Fa Sol, and its name comes from *dia-*, which is like *di-*, and *penta*, meaning "five notes".

[14-16] [...with] diapente is Fa Sol La-Re Mi Fa Sol La, or Re Mi Fa Sol La-Re Mi Fa, and the origin of its name is as I said before.³⁰ The tone with diapente is Fa Sol La-Re Mi [Fa Sol]. Semitone with diapente is [...] Mi Fa [...] Mi Fa Sol.

²⁴ The author is using the term as meaning "interval" or "series of intervals" rather than our modern concept of "counterpoint." Therefore, the maximum number of possible "counterpoints" between two voices will ultimately depend, in his opinion, on the range of these voices.

²⁵ The note Do (or C). The author spells it with a final *dalet* (*d* sound), a further indication that he is a Catalan speaker, since this language pronounces all voiced final consonants as voiceless. This and other similar spellings will be regularized in our translation, while retaining the term "Ut" for the note Do.

²⁶ A cognate to the English verb "to intone".

²⁷ The etymology is wrong, since the Greek prefix *dia* means "through, across, between".

²⁸ In Latin.

²⁹ The hyphens appear in the manuscript.

³⁰ According to Adler, here the text is corrupt or at least faulty. This note-series corresponds to ditone plus diapente, which appears latter in the text. Meanwhile, the description of the semitone plus diapente that we find below should, according to the regular order, come at this point and explain the semitone plus diapente (Re Mi Fa Sol La-Mi Fa).

[17-20] Ditone with diapente is Ut Re Mi Fa Sol La-Re Mi. And finally a diapason is Ut Re Mi Fa Sol La-Re Mi Fa. It is called this way because *dia-* is just like *di-*, and *pason* means “all,” just like *tutum*³¹. This means that the rest of intervals are similar to the aforementioned, even if they have a different number. Thus, the unison is similar to the octave but with a different number; a third is like a tenth, etc.

[21-28] “Unison” means that there is a single note, even if there were four voices singing it simultaneously. A third is a range of three notes, containing – *contenen*-³² one tone and one semitone, in which case it is called a minor third. The Major third contains –*conté*- two tones. A minor fifth is an interval of five notes that includes two tones and two semitones. A major fifth is a range of five notes, containing three tones and one semitone. The minor sixth is an interval of six notes, and there are three tones and two semitones. A major sixth is an interval of six notes, including four tones and one semitone. A seventh is a distance of seven notes that contains five tones and two semitones³³.

Section III

[1-2] How should one build a counterpoint? This science has a rule: if we have a lead singer, known as *cantus*, singing in a lower voice or tenor, then when he ascends the counterpoint descends. And when the *cantus* descends, it is necessary for the counterpoint to ascend. If they happen to ascend or descend together, it should be by an interval of the kind called “similar imperfect”.

[3-5] There are two ways of constructing a counterpoint: by one and by many. When the counterpoint is “by one,” we must begin the counterpoint with a full interval, called “perfect.” Otherwise, when the counterpoint is “by many” it begins according to the will of the singer, although certainly the different singers need to leave space for each other.

³¹ *Pason* means “all” in Greek, which the author re-translates as “*tutum*” here, using the Latin term and not the Catalan one. Thus, in the same phrase he is simultaneously using the Hebrew, Greek and Latin versions of the same word. Then the author proceeds to explain why the octave or diapason is called “all” or “complete” even if there are intervals bigger than an octave. Note that the author alternates the Greek term *diapason* and its Hebrew equivalent *sheminit*, which literally means “octave”.

³² The author’s Hebrew is generally correct but quite basic. Thus, he is using the expressions *la’amod be* and later later *le-hazek et* instead of the correct Hebrew verb *lehakhil*. Realizing that this doesn’t convey the exact meaning he intended, the author adds the Catalan equivalent *contenen/conté*, between hyphens. The unusual transliteration could also correspond to Provençal forms of the same verb (*contenun, contén*).

³³ These are the loan words section two. From Catalan: *contrapunt, tenor, mesura, unisó, semitó, tonar, semiditó, to, tons, diatèsson, diapente, ditó, conté, contenen*. From Latin: *cum, tritonus, tutum*.

[6-14] It is not allowed to make two consecutive perfect intervals if they are similar, like two fifths for instance. It is possible to write two or more consecutive dissimilar perfect intervals, like a fifth followed by an octave. According to the Ancients, it is allowed to write three, four, or even five imperfect intervals in a row³⁴. A third can only be followed by a fifth under or a unison over, knowing that this happens when there is not a single [...]. Similarly, it is not allowed to follow a sixth with anything but [...] a seventh under or an octave over³⁵. One cannot write a tenth followed by anything but a twelfth under or an ascending over. A thirteenth has to be followed by a fifteenth under or a twelfth over. If the cantus melody ascends or descends several notes, the discantus (which means [...])³⁶ can remain in a single note, or ascend or descend by one note. If the cantus stays on the same degree during three or four notes, the counterpoint can descend or ascend by several notes.

[15-16] Ascendant and descendant movements can be understood in two ways: ascension by notes and ascension by number, and the same happens with the descendant movement. How many ways can one practice counterpoint? In two ways, “by one” and “by many”³⁷.

Section IV

[1-4] Honorable gentlemen, with the help of God and according to my understanding, I want to explain and elucidate the proportions as I promised³⁸. And I will do it with the permission of the great sages that teach in the city of Paris. According to *mestre* Joan Violant³⁹, who teaches the honorable science of

³⁴ Breaking his systematic use of exclusive tag-terms, in the explanation of this rule the author consistently duplicates the terms, first in Hebrew (*minim shelamim, minim bilti shemalim*) and then in Catalan (*perfetes, imperfetes*). Note that the Hebrew term that we translated as “to make, to write” is very vague. It is never clear if the author is talking about actually *writing* a counterpoint melody or about improvising it somehow.

³⁵ Here we tried to convey the very concise, almost cryptic, writing style. The fragment refers to the resolution of imperfect consonances: a third has to be followed by a fifth if the tenor descends, or by unison if the tenor ascends; a sixth has to be followed by a descending seventh or an ascending octave. On the other hand, the manuscript shows three dots both after the expression “not a single” (*lo... ehad*), and after “anything but” (*im lo yihieh...*) showing that the author realized that both phrases were incomplete.

³⁶ There is a gap in the manuscript. The author is unsuccessfully trying to find a Hebrew equivalent of the Catalan term *descant* (“discantus”).

³⁷ The meaning of this paragraph is uncertain. *Kol*, which means “note” in the rest of the text, here may also mean “voice.” *Lehitlamed* means “to teach oneself, to practice, to use, to train oneself.” This seems to be part of a series of questions and answers or definitions, and probably the author could remember the rest of the argument. Therefore, he does not bother writing any further details. Regarding the loanwords of the whole section three, we note *contrapunt, tenor, cant, descant, perfet, perfetes, imperfetes*, all of them from Catalan.

³⁸ There is a sudden and radical change of style on section four. This fragment may have been written as a public presentation, or may be a literal transcription of another lecture. In any case, the Hebrew is willingly ceremonial but somehow pretentious and lacking of literary quality.

³⁹ That is, Jean Vaillant (born ca. 1360-90). The author uses the Catalan honorific title *mestre*, from the Latin *magister* (“teacher”).

music in Paris, it is necessary for every musician to possess three qualities, which are as follows: qualification, a pleasant voice, and wisdom⁴⁰. Music pleases the Divine, is appreciated by the Creator of the world, and makes every person rejoice⁴¹. Therefore, a proportion is the act of setting three values in place of one or two⁴².

[5-6] Gregorian chant is measured according to a general proportion established by the composer, and through a short series of proportions that follow geometrical rules. According to a tractate written by the great Mu'er, God has a single proportion or entity, and yet he created the three elements, fire, earth and water in order to serve him. Therefore, this is an example of proportion: there are three elements corresponding to a single Creator⁴³.

[7-9] It is true that, in the art of music, we have 8 ratios or proportions, just like in a melody there are 8 "tones," or in every "tone" there are two subdivisions⁴⁴. The proportions are as follows: two "tones," double, instead of the first "tone," *dupla*⁴⁵; *tripla* are three "tones" instead of the second "tone;" four "tones"

⁴⁰ This may be a partial citation of J. Tinctoris: "cantor perfectus redditur henc sunt: Ars, mensura, modus, prolatio, voxque venusta" (WEINMANN, Karl (ed.): *Johannes Tinctoris (1445-1511) und sein unbekannter Traktat «De inventione et usu musicae»*, F. PUSTET, Regensburg, 1917, pp. 33-34.) In light of this source, the Hebrew text could also be translated as "measure (*midah*), pleasant voice (*hanaḥat kol*), and art (*she yihyeh ḥakham*)." For an online version of the whole text, cf.

http://www.chmtl.indiana.edu/tml/15th/TININV_TEXT.html

⁴¹ The expression has a reminiscence to Gallicus' *Ritus Canendi*: "Ars est igitur musica Deo placens ac hominibus, omne quod canitur discernens et diudicans, ac de cunctis quae fiunt, non solum intendendo vocolas atque remittendo, sed etiam tempus metiendo, veram inquirens rationem" (Johannes Gallicus. *Ritus Canendi*. ed. Albert Seay, Critical Texts, no. 13. Colorado Springs: Colorado College Music Press, 1981, Book 2, ch. 2;). See http://www.chmtl.indiana.edu/tml/15th/GALRC1_TEXT.html).

⁴² Meaning uncertain. It is a real *non-sequitur* and doesn't seem to have any continuity in the text.

⁴³ The text is hesitant and unclear. Alter suggests that this otherwise unknown Mu'er could refer to Johannes de Muris (1300-1350, also known as Jehan des Murs), one of the main theorists of the Ars Nova. In fact, de Muris has a whole tractate called *Musica Speculativa* on the hidden nature of music. It is, however, surprising that our text designates him as *ha-rav rabbi MWR*, which is a honorific title for rabbis only. I would attribute it to the poor Hebrew style, often lacking of lexical precision.

⁴⁴ Lit. "two proportions." These could refer to the half-step subdivisions of a tone, or more probably, the two proportions, *dupla* and *tripla*. Through this whole section, the author is using the Catalan word *to* (generally "tone") in its alternative meanings of "note" or even "value." When talking about the 8 "tones" he may be even referring to the eight Gregorian modes, thus excluding aeolian, locrian, and ionian, which were considered transposition of other modes that shared the same hexachords. This makes the text particularly difficult to understand. We opted for not simplifying this ambiguity.

⁴⁵ A *proportio dupla* in mensural notation implies that two notes of a particular value will fit in the time previously occupied by a single note of this value. See introduction. *Dupla* means

instead of the third “tone;” five instead of the fourth; six instead of the fifth; seven instead of the sixth; eight instead of the seventh “tone;” nine instead of the eighth “tone”⁴⁶. Sesquitertia proportion instead of the first “tone;” sesquiquarta proportion instead of the second “tone;” and hemiola instead of the third; epogdoi instead of the fourth; epitrita instead of the fifth; semiepitreta instead of the sixth; tonus acutus⁴⁷ instead of the seventh; sesquioctava instead of the eighth; sesquialtera when the sesquitertia is not present.

[10-11] What is a proportion? A proportion is a disposition of words⁴⁸, an ordination of chant, a way of that makes one word to become many words through the use of the fitting proportion, and [only limited by] as many words as a person could articulate. *Proportio est dispositio rei, ordinatio cantus, facere de sola plures per vim proportio et ea quae homo de suo ore posset pronuntiare*⁴⁹.

[12-14] It is generally said that there are eight proportions: [...]first sesquialtera, second hemiola, that hold number of nine⁵⁰; sesquitertia, epitrita⁵¹, that hold four in the space of three; sesquioctava, epodoidoi, that hold nine in the space of eight; sesquiquarta holds [five⁵²] in the space of four; dupla sesquiquarta holds eight in the space of six⁵³. The rest of proportions derive from the fore-

“double” in Latin, and the author is using both terms in the phrase (*dupla* and its Hebrew equivalent *kaful*).

⁴⁶ That is 3:2, 4:3, 5:4, 6:5, 7:6, 8:7, and 9:8. It is unclear why the author sometimes writes on numerals and sometimes on ordinals (*four*, and then *seventh*). This may be due to Hebrew misspellings.

⁴⁷ For *tonus acutus* cf. Johannes de Muris *Musica Speculativa* (http://www.chmtl.indiana.edu/tml/14th/MURMSPEC_MVBM8-24.html), and Boethius *De Institutione Musica*, liber III.

http://www.chmtl.indiana.edu/tml/6th-8th/BOEMUS3C_MCTC944.html).

⁴⁸ The word *davar* can mean “word” or “thing.” At the beginning of the text, the author even used the same term to designate the discantus. *Davar* is related to the verb *ledaber* (“to say, to pronounce”). I suspect that the author is trying to reflect the Latin use of *pronuntiare* as “to articulate, or to pronounce a syllable when singing.” Thus we read in Ugolini *Urbevetanis’ Declaratio musicae disciplinae*: “Per accidens dicitur, quia accidit tropo qui per se per [sqb] quadrum formatur, ut inepta removeatur pronuntiatio tritoni per B molle cantari.” (http://www.chmtl.indiana.edu/tml/15th/UGODEC1B_TEXT.html)

⁴⁹ This phrase appears in Latin in the manuscript, although in Hebrew characters, which makes its reading somehow insecure. I believe that it is a simple repetition of the preceding Hebrew phrase, a sentence that is unclear by itself. Therefore, this translation reaches a compromise by harmonizing both phrases.

⁵⁰ Sesquialtera and Hemiola are synonymous, and designate the proportion 3:2. Adler (RISM p. 62) thinks that the text is disrupted and there should be a missing introductory phrase, reading “sesquialtera and hemiola hold three notes in the space of two; first sesquialtera, second hemiola, they hold together a number of nine.” See section VI, line 20.

⁵¹ Stone (“The *Ars subtilior* in Paris” p. 387) notes the somehow unusual fact that the author gives both Latin and Greek terms for the ratios, since most 14th century treatises only use Greek terms when talking about pitch proportions, not rhythmic ratios.

⁵² The reading is dubious.

⁵³ The author seems to be mistaken. It should be 9:4.

mentioned. These proportions are in use since ancient times, and modern composers have explained them better than I. However, even if I am unworthy of explaining such a complicated subject, now I will expose my opinion on this matter, and I will explain the first one of these proportions, which is the restriction⁵⁴ called *dupla*. It consists on placing two note-values⁵⁵ in place of one, like placing two semibreves in the space of one, or in a similar way, all other note-values.

[15-17] The *Dupla* proportion is an enforcement, that is, a *gamut*⁵⁶ that holds two note-values, that is to say, three *acut* and three *soupir acut*⁵⁷. *Dupla* is a musical term meaning “two,” just like by nature it would be fitting to call it “thin,” that is to say, *acuta*⁵⁸. In truth, this *dupla* proportion is [expressed] by a thinner letter “f,” that is to say, a *soupir acuto*⁵⁹.

[18-27] I will say that there can be three kinds of transformation regarding this proportion⁶⁰: the first one, in the *gamut*, the second in Gregorian chant, and the third in musical melodies. In the *gamut*, as I said before, [it happens] when the note-values double, [filling] the original space of a third note. In Gregorian chant, [it means that] the melody is forced to ascend by its double. As they say in the Occitan language, *doblam*⁶¹. This applies both to ascend and descend. When we talk about musical melodies, it is obligated that the melody and the person work together, and therefore, the melody doubles⁶². It is necessary to

⁵⁴ Hebrew *gedirah*, “fencing, restriction, delimitation.” Note the change of terms, since the author has been designating the proportions or ratios by the correct Hebrew term *yehes* until this point.

⁵⁵ Lit. “shapes.”

⁵⁶ We understand this *gamut* to simply mean “range of notes.”

⁵⁷ *Soupir* means “pause.” *Acut* seems to be used as if it were the name of some note-value or a particular shape of a note.

⁵⁸ The word we translated as “thin” (*dakah*) could also mean “slight, tenuous, small, slim, fine, spare, slender.” Once again, the meaning of *acut* is not clear. Among the possibilities, it could be “high-pitched, sharp, slim.”

⁵⁹ It is unclear to me what is the relationship between *dupla* and *acut* or its pause. What is apparent is that the author is trying to establish some sort of etymology, and explain that this relationship is based on a sign to indicate *dupla*, that looks very much like a thin (*acuta*, *dakah*) Latin letter “f.”

⁶⁰ That is, the *dupla*.

⁶¹ The text uses the abbreviation aleph-shin for the name of the language. It seems to us that the only coherent choice would be Occitan. In fact, *doblam* means “we double” in Occitan (although one may argue that this verbal form would be perfectly correct in Oriental Catalan and some other dialects). In any case, Occitan and Catalan are mutually understandable and geographically contiguous, so the author would certainly know both of them.

⁶² The meaning is very uncertain. The alluded melody could refer to an instrumental part. The verb we translated as “work together,” could also mean “to become weary or tiring.” Thus, one could understand the phrase as meaning that the *dupla* proportion is used in melodies in order to create variations, so that the repetition of a strophic series doesn’t become tiring.

know how this proportion is notated, and if one would use a major or a minor prolation. I will say this: one should write it as a number two⁶³, or using blue color, or using black ink⁶⁴ for all the note-shapes for a major prolation, while using yellow or green for a minor prolation. It could also be represented by half a circle cut in half, or a full circle cut in the middle, which would mean the same proportion⁶⁵. Through the use of this ratio, one can express many combinations, if used together with a variety of note-shapes. For instance, if one takes two notes written with the same ink color, and then substitutes the full shapes by the empty shapes, and the empty shapes by the full ones, we would have a sesquialtera proportion represented by a dupla ratio, and then the proportion would be called *super-bipartiens*⁶⁶, because using the dupla proportion, they would look the same, as it will be explained by the end of this book⁶⁷ on proportions. We have concluded the explanation of the dupla ratio. We will now begin to explain the tripla proportion.

[28-36] Let us elucidate what tripla is. Tripla happens when three note-values are placed in the space of one, for instance, by placing three semibreves in the space of one, and so on. The tripla derives from something that is perfect⁶⁸, that is from a perfect *modus* and perfect *tempus*, when a semibrevis is multiplied by three⁶⁹. In Gregorian chant, a melody can be set⁷⁰ on four different systems, established by Gregory, which are semibrevis, tripla, proportion and *tempus perfectum* -also called brevis and semibrevis-, this ratio is called mode, and the same happens with the rest of signs⁷¹. And we can set [this ratio] both in major and minor. This relationship derives⁷² from ut-re-mi, and the wise master Jean Vaillant⁷³ said that this tripla ratio is equivalent to three, and all this delimitates

⁶³ The word used is *sefer*. I agree with Adler (RISM p. 62), who suggests that the manuscript should probably read *mispār* (number). In Hebrew, both words share the same root. Their spelling differs by a single letter.

⁶⁴ Stone (“The Ars subtilior in Paris” p. 387) notes that, although the use of colors other than red had no tradition in the European continent, it was a common tradition in 15th century England, thoroughly described by John Tucke in the 16th century. This may be an indication that, other than French music theorists, the Anonymous Florence may be reflecting some English teachings.

⁶⁵ That means, a slashed C or a slashed O.

⁶⁶ We are following the reading suggested by Adler (RISM p. 62). The manuscript reads something like *superbis portie(n)s*, a form probably due to a *fausse-coupure* together with some vowel hesitation.

⁶⁷ Was the author actually intending to write his own tractate on proportions? That would certainly explain the change of writing style at the beginning of this section.

⁶⁸ Or “whole” (Heb. *Shalem*).

⁶⁹ Or “divided by three” (Hebr. *Tekafel sheloshah pe’amim*, “doubled three times”).

⁷⁰ Or “when we want to explain (divide?) a Gregorian chant melody through any of the four systems established by Gregory, which are semibrevis, tripla, proportion and perfect (full) time –called brevis or semibrevis-, then this proportion is called *modus*.”

⁷¹ Lit. “shapes.” It could mean note-values or simply graphic signs indicating proportion.

⁷² Or “descends.”

⁷³ Original spelling “Joan Violant”. “Joan” is the Catalan spelling of Jean/Johannes. Hebrew transliteration often poses problems when representing diphthongs.

the names of the notes⁷⁴. He also said that the elucidation of the basic elements of music is due to three wise men⁷⁵: Pythagoras, *Kwly*, Aristotle⁷⁶, and Boethius. Pythagoras discovered ut fa, *Kwly* found re sol, Boethius discovered mi la. If so, then the names of the notes are this six, and the tripla ratio appears. These are ut-re-mi for the present world, and fa-sol-la for the world to come⁷⁷. It is fitting to represent this ratio with the following sign⁷⁸, or using golden ink, or even writing thinner shapes. End of this part⁷⁹. See the notes below⁸⁰.

Section V

[1-3] Unison⁸¹, third, fifth, sixth, octave, tenth, twelfth, thirteenth, fifteenth, seventeenth, nineteenth, twentieth. Six of them are perfect and six imperfect. The perfect ones⁸² are unison, fifth, octave, twelfth, fifteenth, and nineteenth. The ones that are not perfect are the third, sixth, tenth, thirteenth, seventeenth, and twentieth.

[4-19] Now I want to talk about prolations. Prolations⁸³ are divided in five: *maxima*, *lunga*, *brevis*, -that is, one *tempus*- *semibrevis*, *minima*. The *maxima* should be drawn like this, the *lunga* like this, the *brevis* like this, the *semibrevis*

⁷⁴ Or “all this used to establish a framework for the names of the six notes.”

⁷⁵ Or “he said that when they discover [it], there were three wise musicians.”

⁷⁶ Aristotle, which is spelled in its Catalan pronunciation, is preceded by a four-letter name, *Kwly*, that could be read in many different ways: Caulais, Coulis, Coulais, Coule, Culai, or even, as Adler reads, Euclid or Clio, although these two readings seem to me quite forced. As Adler notes (RISM p. 62) the manuscript displays some dots under “Aristotle,” signs that cannot be interpreted as vocal marks, but rather as a sign marking erasure. Since the author is about to enumerate three wise men, and not four, we think that Aristotle might well be a mistake that the author marks for erasure. In the following lines, the author attributes to this enigmatic *Kwly* the discovery of *re sol*, and does not mention Aristotle anymore.

⁷⁷ According to Adler (RISM p. 62), this digression about the names of the six notes is parallel to Johannes de Muris explanations (cf. Lucie Dikenman-Balmer. *Tonsystem und Kirchentonen bei Johannes Tinctoris*. Paul Haupt, Bern, 1935, p. 65, note 4).

⁷⁸ Cf. RISM, p. 70 (facsimile of page 2b, line 15).

⁷⁹ Loanwords of this section: *mestre*, *músic*, *gregorià* (*gregorial*), *geometria*, *música*, *to*, *gamut*, *efa*, *gama*, *musicals*, *mode*, *Gregori*, *Joan*, *Pitàgores*, *Aristòtil*, *Boeci* (that is, the pronunciation and spelling of these personal names), all from Catalan. *Dupla*, *tripla*, *sesquitercia*, *sesquiquarta*, *hemiolia*, *epogdoi*, *epitrita*, *semiquepitrita*, *sesquioctava*, *sesquialtera*, *semibreve*, *semibreves*, *super-bipartiens*, from Latin. *Epogdoi*, *epitrita*, from Greek. *Doplam*, from Occitan. *Prolation*, *azure*, probably from French. *Acut* is not documented as such in Medieval Catalan, although it could be a local pronunciation of the Catalan word *agut*, or an old Occitan form, or even an ultra-corrective spelling based in the Latin *acutus*. *Mussikai* is a Hebrew adjectival flexion based on a Catalan term.

⁸⁰ It is not clear to which one of the illustrations of the manuscript is the author pointing to.

⁸¹ The beginning of this chapter is totally abrupt, a *non sequitur*.

⁸² Here the author uses the Catalan word followed by its Hebrew translation (*perfectes*, that is to say *shelamim*). *Shelamim* also has the meaning of “complete”.

⁸³ The author uses first the Latin word, then the Catalan term.

like this, and the *minima* like this⁸⁴. And we have two types of prolation, the major and the minor. A major prolation is when a *semibrevis* is worth three *minimas*, like this⁸⁵. It is necessary to write the *semibrevis* using one of these two signs: this one or this one⁸⁶. In a minor prolation, one *semibrevis* is worth two *minimas*, like this, and it can be written like this, this or this⁸⁷. Therefore, all melodies are generally written either in a major or a minor prolation. At the beginning of a song, one should clarify three things: the type of prolation, the type of *brevis* or *tempus*; and the type of *lunga*, or *modus*. If the prolation is major, and the mode and *tempus* are perfect, it is fitting to count three *breves* for one mode, like this⁸⁸, while the *tempus* equals three *semibreves*, like this⁸⁹. If the prolation is minor, the mode perfect, and the *tempus* perfect, it is notated like this⁹⁰, and the *tempus* equals three *semibreves*⁹¹. If the prolation is major, but both the mode and the *tempus* are not perfect, it should be notated like this, and the *tempus* should be represented like this⁹². If the prolation is major, the mode imperfect, and the *tempus* perfect, it should be represented like this, and the *tempus* will be like this⁹³. If the prolation is major, mode is perfect and *tempus* is not perfect, it should be notated like this, and the *tempus* like this⁹⁴. If the prolation is minor, the mode is perfect and the *tempus* is imperfect, it should be notated like this⁹⁵, and the *tempus* like this⁹⁶. We have concluded our talk on *maximas*, that is, the “long ones”⁹⁷, on *tempus*, and on the *semibrevis*. We will now describe the different ways of notating. And since the philosopher said that one should first undertake the biggest and more complex subject, we will begin by the *maxima*.

[20-30] It is said that one should notate the *maximas* like this⁹⁸. These are called ligatures, or *maxima* signs. The signs for the long ones, also called

⁸⁴ This is followed by drawings of all of them (cf. RISM p. 70, facsimile of p. 2a of the manuscript, line 22-23). It is interesting to note that now the author is using the Hebrew terms for *lunga* and *brevis* (*arukah* and *ketsarah*), while in the preceding phrase all terms were Latin or Catalan.

⁸⁵ Cf. RISM p. 70, facsimile of p. 2a of the manuscript, line 25-27. Note that instead of four *minimas*, we can see one *brevis* and three *minimas*.

⁸⁶ Loc. cit, line 25 and 26. Apparently, the drawing after the sign for the prolation (a half circle with a dot) should in fact be a *minima*.

⁸⁷ Loc. cit. line 27.

⁸⁸ Cf. RISM p. 71, facsimile of p. 3a of the manuscript, line 2.

⁸⁹ Loc. cit. line 3.

⁹⁰ Loc. cit. line 4.

⁹¹ Loc. cit. line 5.

⁹² Loc. cit. line 6.

⁹³ Loc. cit. lines 7 and 8.

⁹⁴ Loc. cit. line 9.

⁹⁵ Loc. cit. line 10.

⁹⁶ Loc. cit. line 11.

⁹⁷ The autor uses the Catalan term, and then its translation to Hebrew.

⁹⁸ Three different figures, loc. cit. line 14.

longas, are like these⁹⁹. One should represent the *tempus* like this¹⁰⁰. The shapes of the *semibreves* are drawn like this¹⁰¹. In the case of the other *semibreves*, which are the ones between the [?] sign number 5 and the *puncti* of [?]¹⁰², one should write the last *punctus* below with the shape of a *longa*. It can be either *longa* or *semibreve*¹⁰³. If it is a *semibreve* it should be counted with the closest to itself, while if it is a *longa* it should be counted alone¹⁰⁴. These¹⁰⁵ two ratios are similar, and are notated with the same sign. They allocate a *longa* and an imperfect *brevis* on a *dupla*¹⁰⁶. If we are in *dupla* proportion, the *longa* will be imperfect mode¹⁰⁷, that is to say, 9 *semibreves* on a *longa*, or 8 or nine noteshapes -big or small- as it happens in the song *Le Saut Perilleux*. Nevertheless, there are few authors that talk about the need and practical realization or dividing a *minima* in eight parts. This is a weak and very limiting procedure, and the composer who does that will weaken the whole melody. It is fitting to notate it like this, as we said before.¹⁰⁸ There are also proportions without a practical use¹⁰⁹ like double *dupla*, *tripla* over *tripla*, *dupla epitrita*, *dupla sesquialtera*, etc. Here concludes the subject of musical proportions¹¹⁰.

Section VI

[1-7] Now we shall speak of the *quadrupla* proportion. The *quadrupla* derives from the *diatessaron*, and holds four note-values in the space of one, like for instance, four *semibreves* on one, and similarly with the rest of note shapes.

⁹⁹ Three different signs, loc. cit. line 16.

¹⁰⁰ Loc. cit. line 17.

¹⁰¹ Loc. cit. line 18.

¹⁰² The text is corrupt and the meaning uncertain.

¹⁰³ Alternative translation: "it is possible [to make] a *semibreve* [correspond] to this *longa* "

¹⁰⁴ Or "while if one is dividing by *longas*, the *longa* is counted as a single beat."

¹⁰⁵ It is a non-sequitur.

¹⁰⁶ Or "these proportions are placed on a long duplex and an imperfect *brevis*."

¹⁰⁷ Or "On this duplex long the mode will be imperfect."

¹⁰⁸ The word *dak*, here translated as "weak," may also mean "thin, delicate, detailed." Therefore, an alternative translation could be: "Few would say -in truth and out of necessity- that dividing a *minima* in eight parts is a too subtle/delicate/refined and complicated matter, since when a composer does so, he makes the song too delicate." It could well mean that some authors believed that dividing a *minima* in eight parts would make the melody difficult to read, since the subdivision will render notes too short. As for the graphic sign, see the facsimile p. 3b, line 3 (RISM p.72), representing a circle with two dots inside. Adler wonders if it should rather be a circle with three dots instead of two (RISM p. 64). Stone Stone ("The Ars subtilior in Paris" p. 388ff) agrees with Adler, adding that Chantilly displays the circle with three dots to indicate 9:8 proportion, although it may be using it as an archaism. As described in our introduction, this unusual notation is common to Coussemaker's Anonymous IX (cf. note 9 in our article).

¹⁰⁹ Or "proportions without limits" or "an unlimited number of proportions".

¹¹⁰ Loanwords of this section: unisó, perfet, perfectes, imperfectes, prolació, prolacions, breva, semibreva, from Catalan. Prolaciones, maxima, lunga, minima, dupla, sesquialtera, from Latin. Prolation, semibreve from French. Epitrita, from Greek.

This proportion originated from a *dupla longa*¹¹¹ and from an imperfect *brevis*. If a Gregorian chant has a minor, imperfect *brevis*, then the proportion will be *dupla longa*. This proportion was popularized thanks to the wise Guido, who used it in his song *Diatessaron*¹¹². According to modern musicians, this term was unheard and unused before, and that is why we place it among the proportions. The master Jean Vaillant¹¹³ says that this is a very valuable and widely practiced proportion for the fourth mode¹¹⁴, whose final note is E¹¹⁵. It takes a *saeculorum* for the fourth note, and then the semitone¹¹⁶. It should be notated like this¹¹⁷, or using indigo, turnsole¹¹⁸ or golden ink. The *caudae* of the note-shapes should be on top of the ones that do not have a *cauda*¹¹⁹. There could be a thousand other proportions, like *quintupla* or *sextupla*, but in practice we do not find them in this particular discipline.

[8-13] From this ratio we have two, which derive from the same concept, the same structure and the same condition. These are the *epitrita* and *sesquitercia*, and they derive from one *brevis* in a minor prolation. Both of them place four notes in place of three. For instance, if the Gregorian melody has three

¹¹¹ The author uses first the Hebrew term, and then adds the Latin (lit. "in their language") translation.

¹¹² Or "who placed diatessaron in his song." Is this Guido d'Arezzo or rather the Guido whose two songs are found in the Chantilly manuscript? Both Adler and Stone Stone ("The Ars subtilior in Paris" p. 392) seem to be in favor of this second possibility, particularly in light of the fact that the Anonymous Florence has previously mentioned another Chantilly song, *Le saut perilleux*. Cf. ms. Chantilly 1047 fol. 25.

¹¹³ Here we have another different spelling, Joan Valent, due to the same transcription difficulties alluded before.

¹¹⁴ The meaning is unclear. Alternative translation: "this ratio is very honored and useful for the fourth proportion." Note that this last word we translated as "proportion" is in fact the very imprecise Catalan term *to* which, as seen along the translation, can take the meaning of "tone, note, mode, scale, melody, etc."

¹¹⁵ Probably, the Latin letter "e" transcribed in Hebrew characters. This maybe a further argument to understand the expression ambiguous expression *ha-to ha-d'* as meaning "the fourth mode" or Hypophrygian, whose final note would be indeed be an E or Mi.

¹¹⁶ Meaning uncertain. Compare it to *Jacobi Leodiensis Speculum musicae*, ed. Roger Bragard, Corpus scriptorum de musica, vol. 3/6 [Rome]: American Institute of Musicology, 1973, chapter 40, as transcribed on http://www.chmtl.indiana.edu/tml/14th/JACSP6A_TEXT.html: "Est autem advertendum quod Guido, in notando praedictam antiphonam et alias multas de quibus exemplificat, pro notis utitur monochordi litteris, licet aliis notis utatur quandoque. [...] Quarta ratio: Finalis vox principalis est in cantu, non solum quia per eam modus amplius cognoscitur, sed etiam quia per eandem scitur ubi responsoriorum versus debeant regulariter inchoari, similiter et differentiae seu "saeculorum, amen" quantum ad antiphonas propter intonationes illarum super psalmos. Adhuc scitur quae neuma, iubilus vel cauda tali respondeat cantui. Ut hoc igitur competenter fiat, opus maxime est ad finalem vocem aspicere, ut, secundum quod finalis acuitur intentione vel gravatur remissione, sit acutum vel grave sit quod ei additur".

¹¹⁷ Fol. 3b line 12 (RISM p. 72).

¹¹⁸ The Catalan word *tornassol* designates a blue colorant extracted from the *Croton Tinctorium* or the *Crozophora Tinctoria* sunflower. It is very soluble and sensible to the action of acids, which make it become red.

¹¹⁹ Meaning uncertain. Alternative reading: "and that the note-shapes should be without tails".

semibreves, using this ratio we will fit in four *semibreves*, even if the prolation is major under a minor, imperfect, *semibrevis*. In this proportion, a big group of notes fits in the space of a smaller group, like when four *minimas* –or any other note-values- are placed in the space of three of the same. The aforementioned proportions appear together, one accompanying the other. Among them, there is one called *sesquiquarta*. The *sesquiquarta* derives from a *brevis* in a major prolation and an imperfect *tempus*. When a *sesquitercia* or its companion ratio interact with a major prolation and an imperfect *tempus*, due to this *tempus* one will sing eight *minimas*, and after that the *sesquiquarta* will come, according to the aspect¹²⁰ of said proportions. A *sesquiquarta* occurs when we place six note-values in the space of four, while perceiving the note-values that come after them.¹²¹ According to the opinion of few musicians, this should simply be called *dupla*, since it is not but a variation of the *dupla* that appears in the working of a melody. And one can use this proportion both on a major and a minor prolation. [14-18] Furthermore, the proportions we have mentioned derive from the *epitrita*. *Epi*, that is, one, *trita*, *per syncopa*. This represents two *semibreves* in the space of one, from a major prolation to a minor one. Similarly, *sesquitercia* apparently derives from the word for six and from the word *tercia*, meaning three note-values instead of the fundamental value. And *sex* and *qui* represent eight over six in a major prolation.¹²² *Sesquiquarta* comes from *sex*, which is the ratio, and *quarta* which indicates its base. *Qui* goes alone¹²³. One should mark this proportion only with this sign¹²⁴. If it has a major prolation, it should be represented by half a circle, like this¹²⁵. For the *sesquiquarta*, we should draw a “6” instead of this sign¹²⁶.

[19-28] Now let us continue this study with the *sesquialtera* and the *hemiola*¹²⁷, because even if *sesquialtera* and *hemiola* are two different

¹²⁰ Or “look”.

¹²¹ Meaning uncertain.

¹²² The meaning of this paragraph is very obscure. Apparently the author unsuccessfully tries to explain the etymology of the word *epitrita* and *sesquitercia*. Part of the confusion comes from the wrong idea that the prefix *sesqui* (“one and a half,” derived from *semis-que*) derives instead from *sex* and *qui* (“six” and “which”). We opted for a literal translation of the fragment.

¹²³ That is, it has no particular meaning; it is just a grammatical particle. The etymology is *sui generic*. See note 112.

¹²⁴ Fol. 3b, line 31, RISM p.72.

¹²⁵ Loc. cit. line 31.

¹²⁶ Loc. cit. line 32.

¹²⁷ Every time the author uses the expression “*sesquialtera* and *hemiola*,” he writes the Latin conjunction *et* (“and,” spelled aleph-yud-tet), even if for the rest of the text he has been using the regular Hebrew equivalent *ve*. The only reason we could theorize for this change is that adding an extra letter *vav* to *hemiolia* will make the transliteration even more challenging. Due to the difficulty of representing diphthongs in Hebrew script, the author already hesitates between several spellings of this word (**eomolia*, **iomuliya*, etc.). In any case, it seems clear that the author pronounced the word *hemiolia*, not *hemiola*.

proportions, they are connected in concept and use the same sign. The wise author¹²⁸ said that these two ratios are separated from all other proportions, because they grab nine notes, resulting on the same proportion both in the major and in the minor. They are based in a major prolation and a perfect *tempus*. No matter if the Gregorian chant uses perfect major or perfect minor, the resulting proportion will be perfect major. The wise master Vaillant said that these two proportions are different in three ways: first, because all the rest of proportions come from these two; second, because they produce more beautiful songs; and third, because Boethius already said that they were sent by the angel who utters “three,” since these ratios multiply three by three, which is nine¹²⁹. From these two proportions we derive yet another one, called *dupla sesquioctava*, which means that we place nine notes in the space of six, thanks to these two proportions. And often it is followed by nine and eight¹³⁰. A few musicians argue that in fact this is nothing but a *tripla*, and that is how they count it. However, in reality, it is a *dupla sesquioctava*. These three proportions are distributed as I said before, since they represent the eight and the six in that multiplication, even if a tripla proportion sign (that is, a three) is written there¹³¹. [The *sesquialtera*] receives its name from the word *sex*, which means one; *qui* does not have a meaning; and *altera*, since in every place it acts like the other one, which is the highest¹³². The word *hemiola* comes from *o...eo*, meaning “of a single body,” and *molia*, which means a ratio of nine over six.¹³³ Therefore, if the *tempus* is perfect and the *modus* is perfect, it will be a *dupla sesquioctava*, because this last ratio derives from the aforementioned two. For this reason, it is important to know how to notate both proportions, either just like this, or by using a circle with a dot inside. And the *sesquioctava* should be marked like this¹³⁴.

¹²⁸ It could still be talking about Guido (d’Arezzo or that of the Chantilly codex), whom the author called “the wise,” a treatment different of that of Vaillant, always called “master”.

¹²⁹ It probably refers to the utterance of the three *kadosh* (“sanctus”) in Isaiah 6:3.

¹³⁰ Meaning unclear.

¹³¹ The reading is very uncertain, and the phrase does not seem to make much sense.

¹³² The word *sesquialtera* is missing from the manuscript, but suggested by Adler (RISM p. 65). The explanation of the etymology of *sesquialtera* is very unclear. The Latin prefix *sesqui-* is in fact a combination of *semis* (half) and *que* (and), meaning “one and a half.” Once again, the author is using the anomalous aleph prefix for *sex*. This is a further proof that these are unrevised notes. In other occasions the author has correctly noted that *sex* is the Latin word for “six,” not for “one,” and that *qui* is, for him, a meaningless grammatical particle that “goes alone”. His explanation of the meaning of *altera* (whose meaning is “other” or “second”) is very unclear. It is possible that the author relates *altera* to the Catalan verb *alterar* (“alter, change, perform a change”).

¹³³ Although the ratio 9:6 is correct, the etymology of *hemiola* is false. It actually comes from the Greek *hemi-olios* (“one and a half”). The word we transcribed as *o...io* is partially unreadable in the manuscript. It could be a transcription of *homoios* (“same, like, similar”).

¹³⁴ The expression “just like this.” could also be translated as “in an isolated way.” In any case, it is not followed by any graphic sign. There is, however, a sign for *sesquioctava*. See folio 4a, line 15 of the facsimile (RISM, p. 73).

[29-34] Now let us talk about *epoidoi* and *sesquioctava*. After the concepts we described before –that is, the ratios *dupla*, *tripla*, *quadrupla*, *epitrita*, *sesquitercia*, *sesquioctava*, *sesquiquarta*, *sesquialtera*, *hemiola*, and *dupla sesquioctava*– we finally see which of these proportions are fitting for the science of music. From all these, there are two ratios, the *epoidoi* and the *sesquioctava*, which are so rarely used that it is not suitable mentioning them¹³⁵. The reasons why we place among the music terms are three: first, because the Greeks already included them; second, because the wise author said that imperfect things have their place alongside the perfect ones; and third, because the wise master Jean Vaillant said that the number nine is the epitome of proportions, and it should be allowed to combine with something imperfect¹³⁶. Done. Finished and complete, glory to the Eternal God¹³⁷.

Section VII

[1] There is still one hidden secret: know that a Gamma-Ut is on the line, A-Re on the space, B-Mi on the line, C-Fa-Ut on the space, D-Sol-Re on the line, E-La-Mi on the space, F-Fa-Ut on the line, G-Sol-Re-Ut on the space, E-La-Mi-Re on the line, B-Fa-B-Mi on the space, C-Sol-Fa-Ut on the line [...] ¹³⁸, A-La-Mi-Re on the space, B-Fa-B-Mi on the line, C-Sol-Fa on the space, D-La-Sol on the line. And this is enough, for those who understand¹³⁹.

[2] Know and understand that if, after singing part of a song, you find this sign¹⁴⁰, you have to sing the same fragment once again, and that will be it.

[3-4] Know and understand that in a major, imperfect prolation like this¹⁴¹, if it happens during the song that a *semibreve* is preceded by many *minimas*, and the *minimas* are followed by a pause, then the *minima* that is closer to the *semibrevis* is equivalent to a *semibrevis*, when the *semibrevis* is by the pause, like this¹⁴². We also have a sign for when, at the beginning of a song, there is no key except for a sign like this, which is called “G.” The sign indicates that the

¹³⁵ Or “so rarely used because they are not very restful”.

¹³⁶ Or “Vaillant said that number nine is the last of proportions, and it is proper for it to be on top of something imperfect”.

¹³⁷ This is a common ending in Hebrew tractates, either religious or secular. Loanwords in this section: *quadrupla*, *semibreves*, *semibrevis*, *dupla*, *longa*, *brevis*, *saeculorum*, *sesquitercia*, *quintupla*, *sextupla*, *prolatio*, *sesquiquarta*, *sex*, *tercia*, *per syncopa*, *quarta*, *qui* from Latin. *Diatessaron*, *epitrita* *hemiola*, from Greek. *To*, *semitó*, *indí*, *tornassol*, *notes*, *minimes*, *prolació*, *Boeci*, *mode*, *perfect*, from Catalan.

¹³⁸ According to Adler (RISM p. 66), here there is a textual lacuna that should read “D-La-Sol-Re, E-La-Mi, F-Fa-Ut, G-Sol-Re-Ut.”

¹³⁹ The language reminds to that of Hermetic and Cabbalistic texts.

¹⁴⁰ Repetition sign See folio 4a, lines 27, RISM p. 73

¹⁴¹ Left-half of a circle with one inscribed dot. See folio 4a, lines 29 on RISM p. 73

¹⁴² Folio 4a, line 31, RISM p. 73.

chanting is fixed from G-Sol-Re-Ut. Therefore, if the melody descends, you count from G-Sol-Re-Ut down, and if it ascends, you count from G-Sol-Re-Ut up.

[5-8] We have four prolations that, in my opinion, should be represented by these four signs¹⁴³. The first one is major perfect, the second is major imperfect, the third is minor perfect, and the [fourth]¹⁴⁴ is minor imperfect. If you want to know if a song is wrong or not, take the song in question and see if it is major perfect or minor perfect; then count all the values in groups of three. That is to say, count all shapes as *semibreves*. If there is a *longa* that is equivalent to three *semibreves*, count four¹⁴⁵, and so on for the rest of note-values. If the song works in groups of three, it is not wrong. It is constructed in a correct manner. However, if it doesn't divide by three, it is incorrect. If the prolation is major imperfect and minor imperfect¹⁴⁶, do count it in groups of two. If you can divide in pairs it is correct, but if you can't, the song is wrong.

[9-12] [Sign]¹⁴⁷ Perfect major. Every shape is equivalent to three, and therefore one counts everything in groups of three. In a perfect major, a *maxima* is equivalent to 81 *minimas*, 27 *semibreves*, 9 *breves*, and 3 *longas*; the *longa* is equivalent to 27 *minimas*, 9 *semibreves*, and 3 *tempus*; the *tempus* is worth 9 *minimas* and 3 *semibreves*; and the *semibreve* is equivalent to 3 *minimas*.¹⁴⁸ In a perfect minor, everything is worth two, except for the *brevis*, which is equivalent to three *semibreves*, and therefore we count them in thirds.¹⁴⁹ In perfect minor the *maxima* is equivalent to 24 *minimas*, 12 *semibreves*, 4 *breves*, and 2 *longas*; the *longa* is worth 12 *minimas*, 6 *semibreves*, and 3 *breves*; the *breve* is equivalent to 6 *minimas* and 3 *semibreves*; the *semibrevis* is worth 3 *minimas*.

[13-14] [Sign]¹⁵⁰ Imperfect major: everything is divided by two, except for the *semibrevis*, which is equivalent to 3 *minimas*. Therefore we count in groups of two. On imperfect major, the *maxima* is equivalent to 24 *minimas*, 8 *semibreves*, 4 *tempus*, and 2 *longas*; a *longa* is worth 12 *minimas*, 4 *semibreves*, and 2 *tempus*; the *tempus* is worth 6 *minimas* and 2 *semibreves*; the *semibreve* is equivalent to 3 *minimas*¹⁵¹.

¹⁴³ Folio 4b, line 4, RISM p. 74. It displays a full circle with an inscribed dot; a left-half circle with an inscribed dot; a full circle with no dot; a right half-circle with no dot.

¹⁴⁴ The manuscript erroneously lists "the third" twice.

¹⁴⁵ Meaning unclear. The manuscript literally reads: "If there is a *longa* that is equivalent to three four *semibreves*, count four".

¹⁴⁶ There is a potential transcription problem. It could read: "major imperfect, with and imperfect modus".

¹⁴⁷ Fol. 4b, between lines 12 and 13, on the right. (RISM p. 74)

¹⁴⁸ This fragment is written in a vertical column, at the right of the scheme (RISM p. 74).

¹⁴⁹ Left vertical column on RISM p. 74.

¹⁵⁰ Fol. 4b, between lines 15 and 16, on the right. (RISM p. 74).

¹⁵¹ Right vertical column on fol. 4b, RISM p. 74.

[15-16] [Graphic]¹⁵² On an imperfect minor, everything is worth two, so we count two and two. In the imperfect minor, the *maxima* is equivalent to 16 *minimas*¹⁵³, 8 *semibreves*, 4 *breves*, and 2 *longas*; the *longa* is worth 8 *minimas*, 4 *semibreves*, and 2 *tempus*; a *tempus* is equivalent to 4 *minimas* and 2 *semibreves*; and the *semibreve* is worth 2 *minimas*¹⁵⁴.

¹⁵² Fol. 4b, between lines 15 and 16, graphic on the left side. RISM p. 74.

¹⁵³ The number 16 is incorrectly spelled *yud-vav*, a combination systematically avoided due to religious implications. Together with the hesitant Hebrew, this could be a sign that the author did not have a solid Jewish education, and perhaps he is even a convert.

¹⁵⁴ This fragment is in the left column. The text finishes here, followed by folios 14a through 15a, which contain a list of exercises on intervals (RISM pp. 75-77). Loanwords in this section: the names of the Latin letters, which correspond to the Catalan nomenclature. *Semibreu*, *semibreu*, *mínima*, *mínimes*, *cantarella*, *major*, *menor*, *perfet*, *imperfect*, *màxima*, *temps*, from Catalan. *Prolation*, from French. *Longa* from Latin.