

1765



PARS PRIMA

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**THE
RITUS CANENDI VETUSTISSIMUS
ET NOVUS
OF
JOHANNES LEGRENSE**

**A CRITICAL EDITION WITH
TRANSLATION, INTRODUCTION AND
NOTES ON THE TEXT**

by

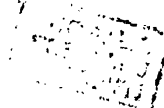
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IN TWO VOLUMES

**SUBMITTED TO GLASGOW UNIVERSITY, THE FACULTY OF ARTS,
IN FULFILMENT OF THE REQUIREMENTS OF
THE DEGREE OF DOCTOR OF PHILOSOPHY**

MARCH 1996

VOLUME TWO



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¹INCIPIT LIBER PRIMUS²Capitulum primum: ³Quis hominum primo cecinerit?

⁴Miror viros nostri temporis, doctos atque peritos, maxime tamen ecclesiasticos, adhibere posse fidem his qui tradunt modos musicos sub petris, ut supra tractatum est, fuisse repertos aut in guttis aquarum et terrae cavernis, nisi forte putent Jubal organa tantum aut citharas fabricasse, quod stulti cogitatus est, nec illum prorsus aut quempiam alterum ante diluvium cecinisse.

⁵Quod si verum est ut post diluvium Graecus, Latinus aut barbarus dulces prior modulari sonos inceperit, nemo necesse est ad illa usque tempora canendi formam habuit, et si nullus ante diluvium huius rei notitiam perceperunt, profecto sacra pagina, quae non mentitur, nobis verum non tradidit. ⁶Scripsit enim Moyses de praefato Jubal qui, ni fallar, extitit ab Adam septimus e stirpe Cain utpote generatus, quod *pater fuit canentium in organis et citharis*, cuius frater, Tubal-Cain, artem eo tempore fabrorum invenit. ⁷Refert quoque Josephus, grandis auctoritatis apud Hebraeos, Graecos et Latinos historiographus, hunc Jubal adeo tenuisse caram sonorum quam exquisiverat artem ut illam in duabus columnis, verens diluvium, sculperet.

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- | | |
|----|------------------------------------|
| 1. | A 1v H 1v |
| 4. | hiis <i>pro</i> his A |
| 5. | si ¹ <i>supra lin</i> A |
| 6. | praefacto A |
| | ex <i>pro</i> e A |
| 7. | a Deo <i>pro</i> adeo A |

¹THE FIRST BOOK

²Chapter 1: ³Who was the first man to sing?

⁴I am surprised that men of the present day, who are themselves learned and experienced people—in particular men of the Church—can put their trust in those who claim that musical modes were discovered, as we have discussed above, under stones, in drops of water, or in caverns under the earth, unless by chance they think that Jubal merely built organs and lyres—this stems from foolish thinking—and that he did not sing at all nor indeed did anyone else, before the time of the Flood. ⁵But if this is true, that after the time of the Flood, the Greeks, Latins and barbarians were the first to begin to sing sweet sounds, then it must follow that no-one until then had formed the habit of singing; further, if no-one before the Flood had any knowledge of this subject, then assuredly Holy Scripture, which does not lie, has not given us a true account. ⁶For Moses wrote about the above-mentioned Jubal who, unless I am mistaken, was the seventh generation after Adam from the stem of Cain, that he was the father of all who make music on organs and lyres.⁶ His brother, Tubal-Cain, discovered during that time the art of metalwork.⁷ ⁷Moreover, Josephus, who enjoyed great respect among the Jews, the Greeks and the Latins as a historian, refers to the fact that this man Jubal held so dear the art of sounds that he had discovered that, for fear of a flood, he had carved out details of it on two columns.⁸

⁶Gn 4,21: Iubal ipse fuit pater canentium cithara et organo.

⁷Gn 4,22.

⁸Cf. Peter Comestor, *Historia Scholastica* (PL 198, p. 1079). Concerning association of this story with Josephus, see Judith Cohen, *Jubal in the Middle Ages*, Dissertation, University of Tel-Aviv, 1975.*

⁸Quarum unam postea gens renovata vidit, prophetarat etenim illis Adam quod mundus cito periret aut per ignem aut per aquam, ob quod Jubal unam de columnis illis fecit latericiam ne solveretur ab ignibus, alteram vero marmoream, ne putrefieret in fluctibus. ⁹Alibi quoque legitur prius illum pro tedio pastoralis mitigando cecinisse, dein ad sonitum sui fratris malleorum causam rei nimis subtiliter exquisisse. ¹⁰Quod si quis noscere cupit qualiter, legat prius egregii doctoris Boetii musicam, et postea decimum, si placet, huius libelli nostri capitulum, quamvis imitatus Graecorum Boetius fabulas et iactantiam, huius rei philosopho Pythagorae totam ascribat gloriam. ¹¹Mei namque propositi non est theoricam huius artis velle post tam eximium virum, nisi forsan raro coactus tractare, quin potius veram priscorum Ecclesiae Christi practicam, quae tota nihilominus ab illo fonte procedit, si possim renovare.

9. legat *in marg* A
 prius *supra lin* H
10. si placet *in marg* H
11. raro *in marg* H

⁸A later people—renewed after the flood—witnessed one of these, and indeed Adam had prophesied to them that the world would quickly come to an end either by fire or by water.⁹ It was because of this that Jubal had made one of these columns out of bricks, to prevent its being consumed by the flames, and the other out of marble, to avoid its crumbling away in the waters. ⁹Elsewhere, we read that he had first begun to sing in order to allay the boredom of country life, and then had researched the reason for this phenomenon, according to the sound of his brother's hammers.¹⁰ ¹⁰If anyone wishes to familiarise himself with the details of this, let him first read the *De Musica* of Boethius, that distinguished scholar, and then, if he wishes, the tenth chapter of this treatise of mine.¹¹ Though Boethius, taking as his models the stories and the claims of the Greeks, ascribes the whole of the credit for this idea to the philosopher Pythagoras.¹² ¹¹It is not my intention to deal with the theoretical aspects of this art in the steps of such a distinguished person, unless this I am compelled to do so on rare occasions. Rather would I discuss the true practices of the early Christian fathers; the practical side emanates from them after all, and I hope to be able to breathe fresh life into them.

⁹Josephus *Antiq. Iud.* 1,70.

¹⁰Cf. Peter Comestor, *Historia Scholastica* (PL 198, p. 1079)

¹¹See below *Pars prima* 1.10.4.

¹²*De inst. mus.* 1,10.

¹Capitulum secundum: ²Quid sit aut a quo dicatur musica, quodque sit universalis linguis omnibus, ac de quatuor mathematicis una.

³Ars igitur musica Deo placens ac hominibus, omne quod canitur discernens et diiudicans, ac de cunctis quae fiunt, non solum intendendo vocolas atque remittendo, sed etiam tempus metiendo, veram inquirens rationem. ⁴Nam et a verbo Graeco, quod *inquirere* significat, musa descendere dicitur, et *musicus*, apud Boetium, *est cui de modis atque rhythmis deque generibus cantilenarum adest secundum speculationem et rationem facultas*. ⁵*Omnis enim ars sive disciplina honorabiliorem habet naturaliter rationem quam artificium, quod manu artificis atque opere exercetur*. ⁶Non parum igitur errant qui musicam aliud esse putant in Gallis, aliud in Italia et in Graecia, seu aliud in singulis nationibus, cum omnium utique sit communis linguarum ac universalis, non aliter quam caeterae tres mathematicae sunt artes. ⁷Sicut enim arithmetica de numeris, geometria de terrae mensuris, astrologia de stellis et de earum motibus, ita quidem musica de sonis scientia est ac vocibus. ⁸Is ergo qui penes nos par habetur numerus, apud quosdam fortassis populos dispar erit et contrarius, aut quadrum hic per geometriam in quatuor triangulos resolutum, id non erit apud gentes omnium nationum?

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|----|--------------------------------|
| 1. | A 1v H 2r |
| 4. | de <i>pro</i> deque A |
| 5. | (ars) aut (sive disciplina) HA |
| 6. | cum sit omnium utique A |
| 7. | de <i>om</i> A |

¹Chapter II: ²The nature of music, and the derivation of the word. The fact that it is the universal language amongst all languages, and how it comes to be one of the four mathematical disciplines.

³Music then is an art which gives pleasure both to God and to man.¹³ It exercises discernment and evaluation in all that is sung, and searches for true reason in all things—not only in matters concerning the raising and lowering of sounds, but also in those concerned with the measurement of time. ⁴*Musa* is said to come from a Greek word meaning ‘inquire’¹⁴; ‘a musician’, according to Boethius, ‘is a person who has a particular gift for melody and rhythm, and indeed for different styles of composition, according to speculative and rational guidelines.’¹⁵ ⁵Every art or discipline, by its very nature, possesses a system commanding more respect than a craft, which is practised by the manual efforts of the artisan.¹⁶ ⁶Those who believe that there is one kind of music amongst the Gauls, another in Italy or Greece, and others in other individual nations, are therefore making a serious mistake; for music is in every way a common universal language above all other languages, and this it has in common with the other three mathematical arts.¹⁷ ⁷Just as arithmetic deals with number, geometry with the measurement of the earth, and astrology with the stars and their movements, so music is the science of sound and pitch.¹⁸ ⁸A number which in our society is considered equal to another—would this number perhaps be considered unequal and opposite in other social groups? Or the fact that a rectangle, according to the rules of geometry here is made up of four triangles¹⁹—will this not be true among all nations of the earth?

¹³Cf. Burtius *Florum Libellus* p. 59.

¹⁴Cf. Isidore *Ety.* 3.15.1; Marchetto *Lucidarium* 6,2-3; see N. Swerdlow, “*Musica Dicitur A Moys, Quod Est Aqua*,” JAMS 20 (1967): 3-9.

¹⁵*De inst. mus.* 1,34 (225,11-15).

¹⁶*De inst. mus.* 1,23 (223,28-224,1).

¹⁷Cf below *Pars secunda* 3.10.4.

¹⁸This reference to the disciplines of the quadrivium is notable for its use of the word *astrologia* rather than *astronomia*. Medieval definitions of the quadrivium ultimately relate to *De inst. arith.* 1,1.

¹⁹Cf. *De inst. arith.* 2,6 (91,18): *quadratus in quattuor triangulos divisus*.

⁹Quod namque sol unus oriatur cunctis gentibus per diem, ac una luna per noctem, non est qui ambigat.

¹⁰Sic de musica sentiendum, o cantores, quoniam, etsi ritus modulandi varii sint varias in nationes atque varius ad docendum usus, non poterit tamen ullus homo canens vocem sursum intendere seu inflectere deorsum quin tonum proferat aut minus semitonium, ditonum aut semiditonum, tritonum aut diatesseron, perfectum diapente seu imperfectum, tonum cum diapente vel semitonium, ditonum cum diapente vel semiditonum, diapason perfectum aut imperfectum, seu ex his quippiam cum illa compositum; circa quae procul dubio tota versari debet contemplatio musicorum. ¹¹Nam et ipse Jubal qui, sicut audistis, pater fuit, hoc est, primus et princeps cantorum, quid valuit, dictante natura, canere nisi quoddam ex illis de tono semitonoque compactum? ¹²Sicut enim de littera, quae pars est compositae vocis minima, syllabae fiunt, ac de syllabis dictiones, et de dictionibus constructiones in grammatica, sic et phthongi quidem sive soni musici canore vocis originem habent, e quibus ortae syllabae musicales, tonus ac semitonium minus, iunctae simul in varias huius artis concrescunt vocum resonantias, quae tamen in ipsis resolvi queant omnia phthongis.

10. sic *bis* HA
 in varias nationes A
 flectere A
 12. pars compositae est A
 vocum *in marg* H

⁹For no-one doubts the fact that it is one sun that rises over all nations, tribes and languages by day, as does a single moon by night.

¹⁰O you singers! This is the view one should adopt about music—since, even if styles of singing and teaching methods vary from country to country, no man will be able, while he is singing, to raise the pitch of his voice or lower it without making use of the following intervals: the tone, the minor semitone, the ditone or semiditone, the tritone, the diatessaron, the perfect or imperfect diapente, the diapente plus tone or semitone, the diapente plus ditone or semiditone, the perfect or imperfect diapason, or any interval which is a combination of these. Surely it is to these topics that all the thoughts of musicians should be directed. ¹¹For even Jubal himself, who, as you have heard, was the father, that is, the first and chief among singers, what could he sing at nature's bidding except some combination of tone and semitone? ¹²Just as syllables are made up of individual letters, which are the smallest units of a compound sound, and words from syllables, and grammatical constructions from words, so sounds or musical pitches have their origin in the inflections of the voice. From these pitches develop 'syllables'—the tone and the minor semitone. These syllables in combination develop various 'melodic shapes' which we associate with the art of music.²⁰ Nevertheless, all these structures can be broken down into their individual pitches.

²⁰Cf. *Mus. ench.* 1 (ed. Schmid p. 1, ll. 1-5); see also Quintilian *Inst. Orat.* 1,4,6 and Calcidius *Comm. in Timaeum Platonis* 1,44. A similar analogy occurs in *Lucidarium* 9.1.2. where the ditones are called 'words'.*

¹Capitulum tertium: ²Quid sit sonus, quid phthongus, quid tonus, quid semitonium minus, cum his quae redundant ex illis.

³Ecce liquet quoniam Jubal, quem natura primum canere docuit, sicut suum idioma proprium absque vocalibus et consonantibus enuntiare nequibat, ita nec ullatenus cantare, si non aliquas de suprascriptis melorum speciebus, aut, ut magis proprie loquar, e toni semitoniique compositionibus proferret. ⁴Ob quod absurdum non estimo, non aliter quam alphabeti nostri litteras in vocales partiri solemus et consonantes ac iterum in mutas, semi-vocales ac liquidas, huiusmodi quoque musicales syllabas et sonoras quoniammodo dictiones hic primum suis in partibus dividere, quo necnon vocabulo quaelibet per se vocitetur quoque modo diffiniatur declarare. ⁵Quoniam, ut dixi, Jubal haec omnia prius humana voce discrevit, ac forsitan in organo, liris et citharis, sola iuvante natura, multum exercuit, ac ubi vero rerum causas inquirendo multa naturae secreta reserasset, normam docendi coevos invenit.

⁶Diffinitio soni generalis: *sonus* ergo, iuxta Boetium, *est percussio aeris indissoluta usque ad auditum*. ⁷*Sonus* autem non ille generalis, sed quem *Graeci phthongon appellant*, est, ut ait isdem Boetius, *vocis casus emmeles, id est, aptus melo, in unam intentionem*. ⁸*Intervallum* vero, dicit adhuc, *soni est acuti gravisque distantia*. ⁹Phthongi ergo soni sunt, sed proprie musici qui scilicet legitimis ab invicem distant spatiis, et sunt ad cantandum aptissimi.

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|----|---------------------------------|
| 1. | A 2r H 2v |
| 2. | his <i>om</i> A |
| 3. | quem <i>om</i> A |
| | loquitur <i>pro</i> loquar A |
| | proferrent H |
| 4. | exstimo <i>pro</i> estimo A |
| | vero <i>in marg</i> H |
| 7. | phthongi <i>pro</i> phthongon A |

¹Chapter III: ²The definitions of *sonus*, *phthongus*, *tonus*, and *semitonium minus*. In connection with these topics, the things which emanate from them.

³It is clear then that Jubal, the first whom nature taught to sing, could not speak in his native language without using vowels and consonants. Similarly, he could not sing without producing at least some of the melodic formulae mentioned above, or, to speak more precisely, the structures made up of the tone and semitone. ⁴As our custom is to divide the letters of our alphabet into vowels and consonants, and to sub-divide them into mutes, semi-vowels and liquids, similarly, I think it a good idea first to divide musical syllables and 'sound utterances' into their basic units, and then to explain what terminology is adopted for each one, and how it is defined.²¹ ⁵Further, as I have already pointed out, Jubal had already made these distinctions in the field of the human voice, and possibly had employed them greatly in playing the organ, the lyre and the cithara, solely with the help of nature. When he had unlocked her many secrets by researching into the meaning of things, he found a way of teaching his discoveries to his contemporaries.

⁶The definition of general sound: sound, according to Boethius, consists of a disturbance of the air which remains intact until it reaches the ear.²² ⁷I do not mean sound in general, but that which the Greeks call *phthongos*, which, as Boethius again points out, is an *emmeles*, that is to say, musical, resolution of the voice onto a particular pitch.²³ ⁸He also points out that an interval is the distance between a high and a low pitch.²⁴ ⁹Therefore, *phthongi* are sounds which are particularly musical ones; they are separated from each other by established distances and are particularly suitable for singing.²⁵

²¹Cf. Quintilian *Inst. orat.* 1,4,6.and above note 20.

²²*De inst. mus.* 1,3 (189, 22-23).*

²³*De inst. mus.* 1,8 (195, 2-3).*

²⁴*De inst. mus.* 1,8 (195, 6).*

²⁵Cf. *Mus. ench.* 1 (3,7-8): *Ptongi autem non quicumque dicuntur soni, sed qui legitimis ab invicem spaciis melo sunt apti.*

¹⁰Illud autem spatium, quod est inter phthongon et phthongon, appellatur intervallum.

¹¹De tono: tonus est duorum phthongorum legitimis spatiis ab invicem distantium quam integra modulatio; diciturque tonus a tonando quod de phthongo perfecte tonet in phthongon, nec habere valet ultra solum intervallum.

¹²Omnes siquidem huiusmodi canorae coniunctiones unum semper minus habent intervallum quam habeant voces.

¹³De minori semitonio: semitonium minus est duorum phthongorum legitimis spatiis ab invicem distantium non integra modulatio. ¹⁴Dictumque semitonium non a *semi*, quod sit *medium*, immo sicut dicitur *semivir* aut *semivivus imperfectum*, non enim medius tonus est, sed de duabus toni partibus pars minima, quod perfecto demonstratur in Boetii musica.

¹⁵De ditono: ditonus est trium phthongorum ac duorum tonorum adunatio, dictus a *duo* Graece quod est *duo* Latine, nam etsi tres sonos sive voces habeat, duos tantummodo tonos in suis spatiis occupat.

¹⁶De semiditono: semiditonus quaedam est trium similiter phthongorum sed toni tantum ac semitonii minoris copulatio, dictus a *semi* sicut semitonium et ditonus, quasi non perfectus ditonus.

11. de *supra lin A*
 phthongon *scripsi* phthongom A phthongum H
 14. pars *in marg H om A*

¹⁰That distance between one pitch and another is called an interval.

¹¹The tone: a tone is an absolutely complete progression between two pitches which are separated from each other by established distances. The word *tonus* is derived from the verb *tono*, because it produces a perfect tone between one pitch and the next; it cannot contain more than one interval. ¹²Certainly, all harmonious pitch combinations of this kind always have one interval less than they do pitches.

¹³The minor semitone: the minor semitone is not a complete progression. It is made up of two pitches separated from each other by established distances.

¹⁴The word 'semitone' is not derived from *semi* in the sense of 'half', but in the sense of 'imperfect' as it is used in the words *semivir* or *semivivus*.²⁶ It does not represent the halfway point in a whole tone; rather, it refers to the smaller of the two divisions of the whole tone. This is clearly explained in the *De Musica* of Boethius.²⁷

¹⁵The ditone: this is made up of three pitches, and is a combination of two whole tones. It is derived from the Greek *δυο*, which is the Latin word *duo*. For even though it contains three sounds or pitches, it contains only two tones within its range.

¹⁶The semiditone: this is similarly made up of three pitches, but is a combination of a whole tone and a minor semitone. The word is made up from *semi*, as in *semitone*, and *ditonus*. It is, as it were, an imperfect ditone.

²⁶For 'semi' meaning 'imperfect', cf *Lucidarium* 2.5.18, *Micrologus* 4,5 (p. 103), and Johannes Afflig. *Musica* in GS 2, p. 238. For use of 'semivir', see *Summa musicae* in GS 3 p. 210.*

²⁷See, e.g., *De inst. mus.* 1,16 (203,8-9): Sed utraque semitonia nuncupantur, non quod omnino semitonia ex aequo sint media, sed quod semum dici solet, quod ad integritatem usque non pervenit. See also, *De inst. mus.* 1,7; 2,29; 3,1.

¹⁷De tritono: tritonus quatuor phthongorum est ac trium tonorum valde discors aggregatio, sic a *tris* atque *tonus* dicta, cum sit ex tribus tonis contiguus tota confecta.

¹⁸De diatessaron, prima consonantia: diatessaron quatuor est phthongorum ac duorum tonorum uniusque semitonii minoris aggregatio, dicta quidem a *dia* quod est *de* vel *per* et *tessara quatuor*, eo quod sit de quatuor sonis effecta.

¹⁹Haec est prima trium perfectarum consonantiarum atque simplicium; sicut enim in alphabeto, demptis quinque vocalibus, aliae litterae consonantes sunt, ita quidem, separatis hic tribus perfectis consonantiis, aliae sunt omnes dissonantiae, quamquam ditonus ac semiditonus, tonus cum diapente sive semitonium et huiusmodi sint compassibiles. ²⁰De quibus loco suo tractabitur, ut spero, diligentius.

²¹De diapente perfecto: diapente perfectum est quinque phthongorum atque trium cum uno semitono minori tonorum connectio. ²²Dicta siquidem a *dia* quod est *per* aut *de*, et *pente quinque*, nam de quinque sonis haec tota conficitur secunda simplex et perfecta consonantia. ²³Quadruplex est etiam, sicut et diatessaron triplex, tot etenim species habere potest omnis coniunctio vocum quot intervalla possidet, de quo tractandum est diligenter in sequentibus.

²⁴De diapente imperfecto: diapente non perfectum est etiam quinque phthongorum, sed duorum dumtaxat tonorum ac duorum minorum semitoniorum discors quaedam compositio.

19. (hic) se (tribus) *dele* H

20. supero *pro* spero A

¹⁷The tritone: this is made up of four pitches, and three whole tones. The interval produced by these sounds is very dissonant. The word is made up from *tris* and *tonus* because its total range is made up of three adjacent whole tones.

¹⁸The diatessaron, the first consonance: this is made up of four pitches, and is a combination of two whole tones and a minor semitone. The term is derived from *dia* which (in Latin) means *de* (from) or *per* (through), and *tessera*, which (in Latin) is *quatuor* (four). This is because the interval is made up of four sounds. ¹⁹This is the first of the three perfect simple consonances. Just as in the alphabet, if we take away the five vowels, we are left with consonants, so if we take away the three perfect consonances, all the rest are dissonances; though the ditone and semiditone, the diapente plus tone, and the diapente plus semitone and others of this type, are compatible.²⁸ ²⁰I shall discuss these in greater detail, I trust, in the appropriate place.

²¹The perfect diapente: this is made up of five pitches—a combination of three whole tones and a minor semitone. ²²This term is derived from *dia*, which translates as *de* or *per*, and *πεντε* which is the Latin *quinque*. The whole of this second consonance is made up of five sounds, and is a simple, perfect consonance. ²³It is made up of four intervals, in the same way as the diatesseron is made up of three; each combination of pitches is able to contain as many species as it has intervals, but I shall treat this matter in greater detail in the following pages.

²⁴The imperfect diapente: there is also an imperfect diapente consisting of five pitches, but it is a dissonant combination of only two tones and two minor semitones.

²⁸Concerning *compassibilis*, cf. below *Pars secunda* 3.2.. For Marchetto's coinage of the term, see Introduction, p. 75.

²⁵De tono cum diapente: tonus cum diapente sex phthongorum est et unius semitonii minoris cum quatuor tonis quaedam auditui compassibilis copulatio.

²⁶De semitonio cum diapente: semitonium cum diapente sex etiam phthongorum est, sed duorum minorum semitoniorum cum tribus tonis integris quaedam quoque non tota discors coacervatio.

²⁷De ditono cum diapente: ditonus cum diapente septem est phthongorum et cum uno minori semitonio discors tota quinque tonorum associatio.

²⁸De semiditono cum diapente: semiditonus cum diapente septem est etiam phthongorum, sed cum duobus semitoniis minoribus quatuor tonorum quae tota discordat collectio.

²⁹De diapason, perfectissima consonantiarum ac tertia simplicium: diapason est octo phthongorum legitimis ab invicem spatiis distantium ac quinque tonorum cum duobus semitoniis minoribus dulcissima modulatio, dicta videlicet a *dia* quod est *de* vel *per*, et *pan*, *omne* vel *totum*, eo quod omnes huiuscemodi vocum aggregationes ipsa contineat et, ut pia mater, in sinu suo foveat ac enutriet. ³⁰Haec tertia consonantia simplex atque perfecta quae, iuxta datam regulam, octo voces habet, intervalla septem et septem species, de quibus disserendum est dum tempus venerit per singula. ³¹Quam profecto, si sibi diapente copules, iam duplicem effectam diapason diapente vocabis, et si diapason duplices, bisdiapason erit; sicque bisdiapason cum diapente et terdiapason replicare potes in infinitum.

25. auditui compassibilis *in marg* H

26. quaedam quoque non tota discors *in marg* H

29. nutriet A

²⁵The tone plus diapente: this interval contains six pitches—four whole tones plus a minor semitone: it is a sound not incompatible to the ear.

²⁶The semitone plus diapente: this interval also contains six pitches, but made up of two minor semitones and three whole tones. It too produces a combination of sounds which is not totally dissonant.

²⁷The ditone plus diapente: this interval contains seven pitches; its combination of five whole tones and a minor semitone produces an absolute dissonance.

²⁸The semiditone plus diapente: this interval also contains seven pitches, and its combination of four tones and two minor semitones is also an absolute dissonance.

²⁹The diapason is the most perfect of the consonances and the third of the simple ones. The diapason contains eight pitches separated from each other by established distances. It is made up of five whole tones and two minor semitones, and is a very pleasing combination of sounds. The term is derived, of course, from *διὰ* (in Latin *de* or *per*) and *πᾶν*, which translates into Latin as *omne* or *totum*. This is because it contains within itself all the combinations of such sounds and, like a devoted mother, cherishes them in its embrace and gives them nourishment. ³⁰This third consonance is simple and perfect. It contains eight pitches, and, according to the established rule, seven intervals and seven species within it, which I must discuss individually when the time comes. ³¹If one couples the diapente to this interval, you will then refer to this as a compound interval, the diapason diapente. If one doubles the diapason, the interval thus formed will be the bisdiapason. Thus, one can continue doubling to form the bisdiapason diapente and so on up to the terdiapason.

³²Inter quas etiam cadunt ditonus cum diapason aut semiditonus cum eodem, et tonus cum diapason, diapente vel semitonium identidem. ³³Quae quidem dissonantiae compositae sunt, sed compassibiles ut in simplicibus. ³⁴Non haec tamen rerum innovatio, sed praecedentium eiusdem naturae vocum replicatio. ³⁵Quod totum utique simul in una figura collectum, si paucis subiectis litteris demonstretur, puto visus humanus in ea satis delectabitur et sensus capacior erit.

³⁶Sit igitur A **♭** tonus, **♭** C semitonium minus, CD tonus, DE tonus, EF semitonium minus, FG tonus, G et iterum A tonus, A autem et **♭** sic quadratum tonus, sed A et **♭** sic rotundum sit semitonium minus. ³⁷Tunc quod AC non sit semiditonus quis velle dicere praesumat et AD diatessaron, AE diapente, AF semitonium cum diapente, AG semiditonus cum diapente, et Aa diapason perfectum? ³⁸Nam et CE ditonus est, et BF diapente non perfectum, F autem ad **♭** quadrum tritonus, et D **♭** quadrum tonus cum diapente, C **♭** quadrum ditonus cum diapente, verum **♭** primum ac **♭** rotundum inter se gignunt diapason imperfectum. ³⁹Octo namque phthongos habet sicut et illud optimum, sed quia cum tribus semitoniis minoribus tonos quatuor tantummodo colligit, ad illius veri diapason dulcissimam concordiam non pertingit.

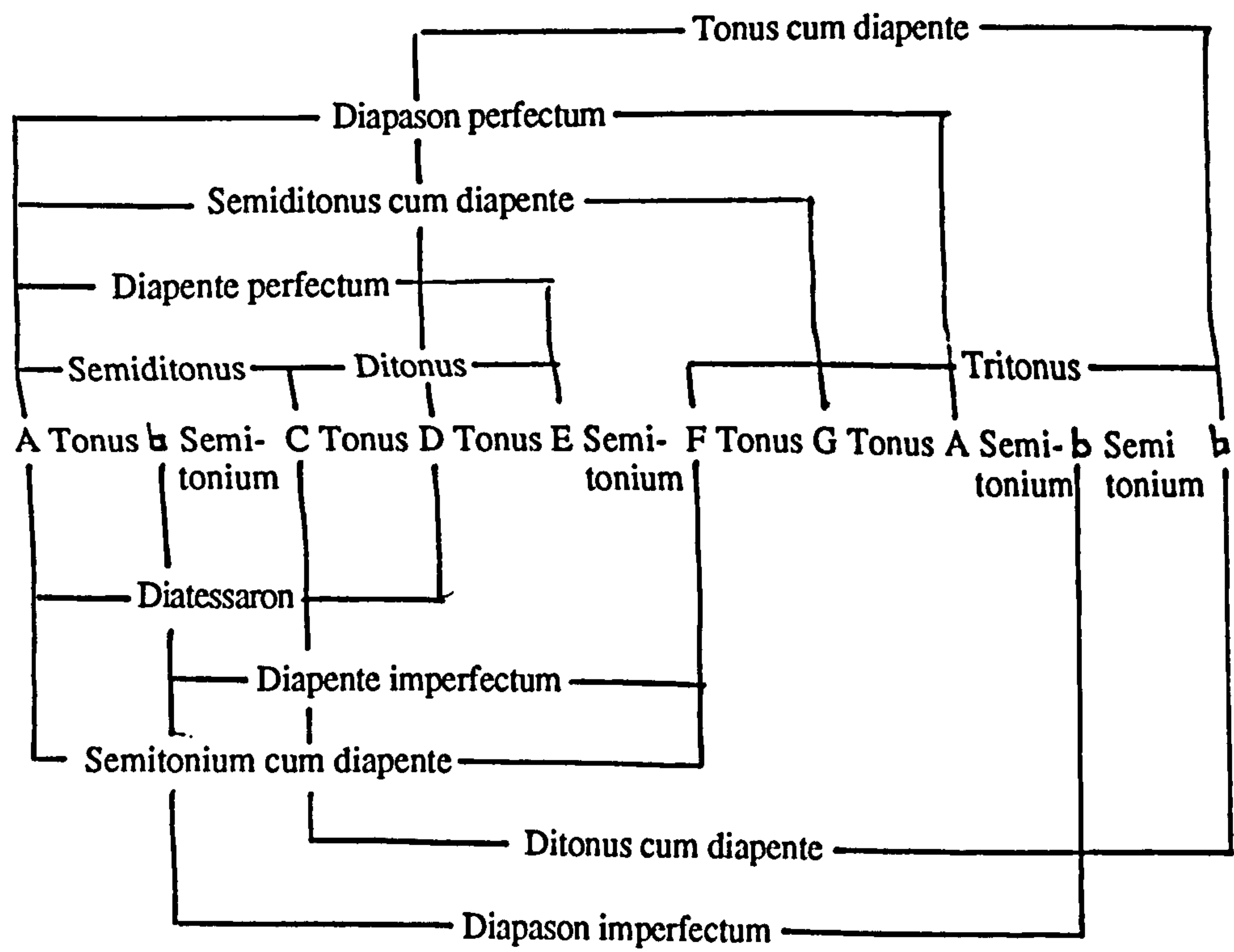
32. in ter *pro* inter A
 35. capatior A
 36. si *pro* sit A
 minus in marg H
 37. et om A
 39. et om A

³²Between these intervals fall the ditone plus diapason, the semiditone plus diapason, the tone plus diapason, the semitone plus diapason, the semitone or tone plus diapente diapason, and so on. ³³These compound intervals are, strictly speaking, dissonant, but are compatible, like their simple counterparts. ³⁴They are not new intervals, but a doubling up of intervals of the same nature which we have mentioned previously. ³⁵All this material, in any case, can be collated onto one diagram; if it can be explained by the use of a few basic letters appended, I consider that the human eye will take pleasure from it, and our understanding be improved.

³⁶Let us therefore establish the following: the distance between A and ♭ is a whole tone; from ♭ to C a minor semitone; from C to D a whole tone; from D to E a whole tone; from E to F a minor semitone; from F to G a whole tone; from G to A again a whole tone; from A to square ♭ is a whole tone, but the distance between A and round b is a minor semitone. ³⁷Then no-one will dare deny that A to C forms a semiditone, A to D a diatessaron, A to E a diapente, A to F a semitone plus diapente, A to G a semiditone plus diapente, and A to a a perfect diapason. ³⁸C to E forms a ditone, ♭ to F an imperfect diapente, F to square ♭ a tritone, D to ♭ a tone plus diapente, and C to square ♭ a ditone plus diapente. However, the first square ♭ and the round b produce between them an imperfect diapason. ³⁹This interval contains eight pitches, as does its perfect counterpart, but since it is formed from three semitones and four whole tones only, it does not achieve the perfect harmony of the true diapason.

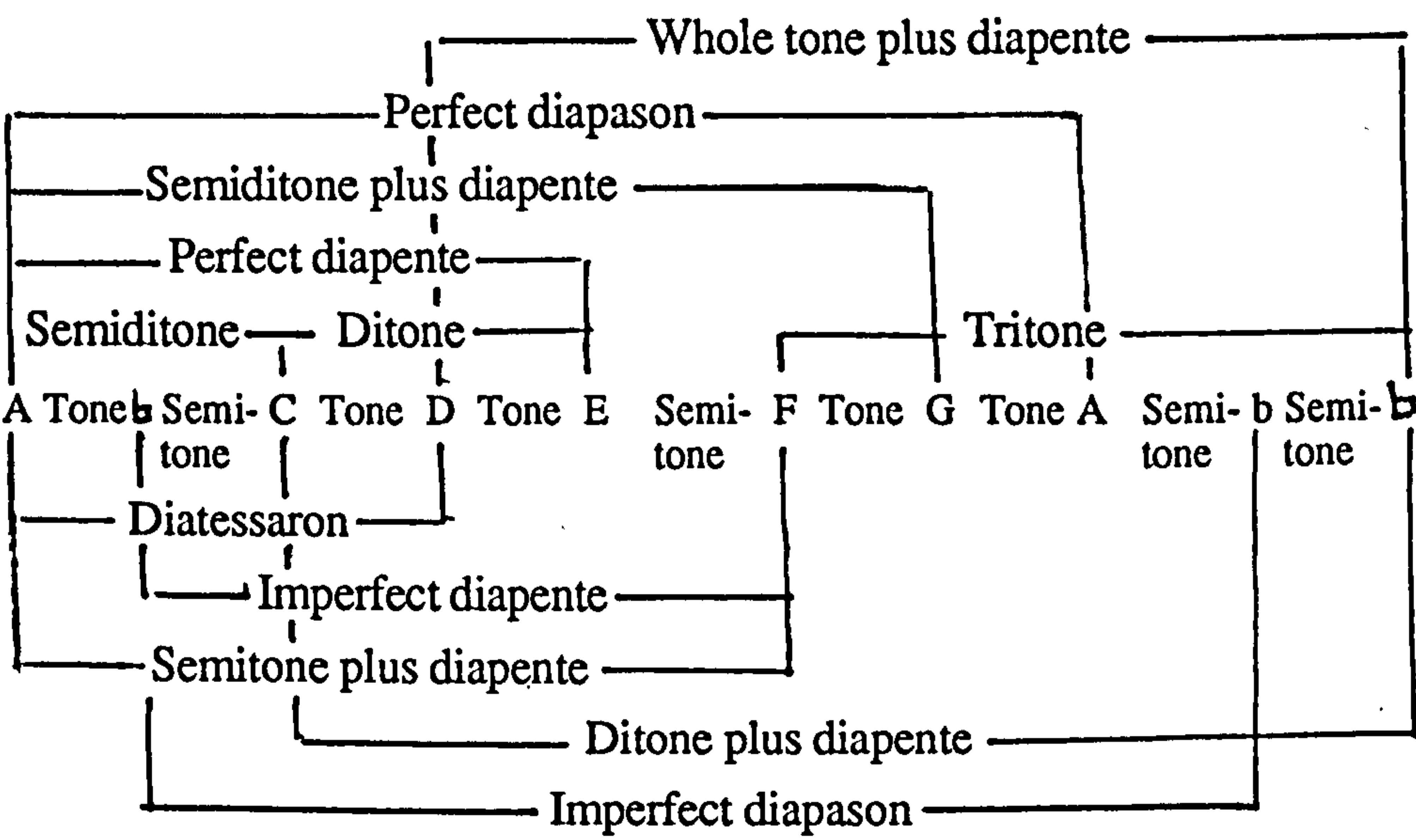
40FIGURA VOCUM OMNIUM CONIUNCTARUM

Quicquid Jubal cecinerit seu canendo protulerit; quicquid Graecus aut Italicus quidve Gallus aut barbarus. Aliud nemo cecinit neque potest aut potuit modulari viriliter quam quod hic annotavimus.



40A DIAGRAM SHOWING ALL THE COMBINATIONS OF SOUNDS

Whatever Jubal sang, or produced by singing; whatever the Greek, the Italian, the Frenchman or the barbarian sang. No-one ever sang anything else; no-one is able, or ever has been able to sing properly other than by using what we have drawn here.



¹Capitulum quartum: ²De primo et antiquissimo tetrachordo: quale fuerit ac unde venerit.

³Praesto nunc, o cantores, qui naturam vocum et sonorum his nostris temporibus ignoratis, nunquam vidistis viros a natura tam mirabiliter modulari voces ut iam non dicam melius, sed certe multo lascivius quam vos illi canant, et nihilominus regulas vestras, ciferas, litteras et characteres, notas atque mensuras non intelligunt? ⁴Quis in civitate Mantua citharoedum illum quem appellabant 'passerem' non vidit, qui novas in harpa sua saepe fabricavit, me teste, cantiones, quas nunquam per se tamen describere scisset? ⁵Alius etiam civis extitit illis in diebus in eadem Italica civitate qui tumultuarias quoque componens cantilenas, atramento vel carbone pinxit aliquando magis quam scripserit, quas nemo quidem canere praesumpsisset unquam nisi quidam cantor mihi notus more communi prius illas descripsisset. ⁶Nunc autem quis dubitet quoniam Jubal a principio sic egerit? ⁷Instigante siquidem natura primo cecinit, ac postea paulatim discrevit sonorum differentias, fecitque fortassis organum et citharas, dulces cantiones etiam composuit, deinde aetas longaeva rerum causas investigat et exercitat sensus. ⁸Quo tamen ritu coevos suos modulari docuerit, aut quibus ad docendum et scribendum usus sit notis, litteris, ciferis, characteribus, aut quibus canendo nescitur, etsi credendum sit Noe filios post diluvium suaves iterum hominibus tradidisse canendi modulos,

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1. A 4r et hoc capitulum om in toto H
 5. tumultuarias scripsi tumulas A
 notus scripsi noctus A
 7. exercitat scripsi exercitati A

¹Chapter IV: ²Concerning the first and oldest tetrachord: its nature and its source.

³Give some attention to this, you singers who are not conversant with the nature of pitches and sounds during these times. Have you never encountered men who pitch their voices so instinctively and so beautifully that they sing not better admittedly, but certainly more uninhibitedly than you, but do not understand your rules, your ciphers, your letters, characters,²⁹ pitches and metres? ⁴There can be no-one in the city of Mantua who has not seen the lyrist whom they called "The Sparrow"* in my presence, he often composed original melodies on his harp, but he would never have known how to write them down by himself. ⁵In fact, there was another inhabitant of the same city at that time who also improvised melodies: he would sometimes paint them, rather than notate them, with black ink or carbon. As a result, no-one would ever have dared to sing them if a certain singer of my acquaintance had not written them out, using the familiar notation. ⁶Now who can be in any doubt that Jubal would initially have acted in this way?³⁰ ⁷Certainly at the beginning he sang instinctively, but then gradually he discovered the differences between sounds; he probably built an organ and some lyres, and composed sweet melodies. Then his long life gave him the opportunity to delve into the nature of things and to cultivate his sensitivity. ⁸No-one knows however how he taught his contemporaries to sing, or what notes, letters, cyphers or characters he used for teaching and writing, or which he used for singing. However, we must believe that after the Flood, the sons of Noah passed on to their fellow men in turn beautiful melodies to sing.

²⁹Concerning the term *character*, see F. Reckow in *Handwörterbuch de musikalischen Terminologie* (Wiesbaden, 1970). * For an analagous useage of the term, see *Micrologus* 5, 21 (p. 113).

³⁰Cf. above nn. 4 and 6.

maxime Japhet qui totus, ut legitur, virtuti deditus erat, et a quo nobis illa philosophorum emanavit progenies, totaque Graecorum et aliarum omnium fere nationum gentilitas.

⁹Nam et primas illas quatuor chordas, quarum Graeci iactitant inventorem extitisse Mercurium, opinor magis ante diluvium ab ipso Iubal exquisitas ac inventas, sed et ad docendum in ordine dispositas atque regulatas, deinde post diluvium a praefatis Noe filiis novae genti novisque populis ita sicut prius erant fuisse traditas. ¹⁰In ea namque musica, quam totiens allegatus Boetius de Graeco vertit in Latinum, legitur illam a principio fuisse simplicissimam, adeo quod quatuor nervis ipsa tota constaret. ¹¹Inde tetrachordum a quatuor chordis appellatum est. ¹²Primus autem nervus et quartus diapason invicem resonabant consonantiam, medii vero simul tonum habentes, ad extremos diatessaron ac diapente reddebant, quod totum his quatuor litteris sequens figura demonstrat. ¹³Si ergo diatessaron AB, tonus autem BC, quisque AC diapente sit negare poterit? ¹⁴Iterumque si BD diapente sit et diatessaron AB resonabit, et AD diapason perfectissimum erit.

8. nationum *scripsi* nationem A

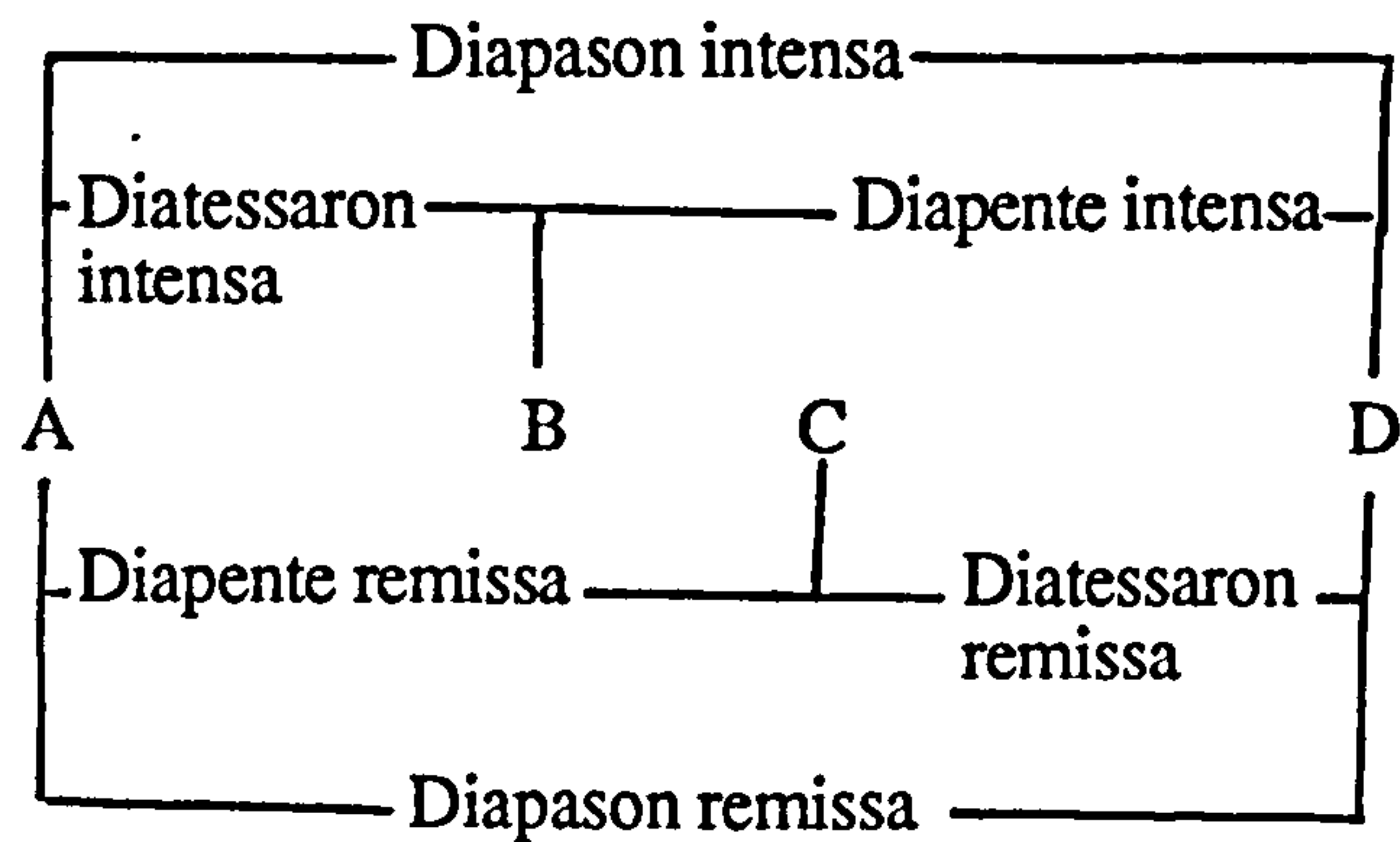
This is particularly true of Japhet, who was totally committed to goodness, so we read.³¹ It is from him that the noble line of philosophers sprang, together with the entire pagan learning of the Greeks and of almost every other nation.

⁹It is my opinion that the first four pitches—which the Greeks claim were invented by Mercury—existed rather before the Flood: that they were sought after and discovered by Jubal himself, and later arranged and tabulated for teaching purposes. Then, after the Flood, they were handed down by the above-mentioned sons of Noah, in their original state, to the new nation and new peoples. ¹⁰In that treatise on music, which Boethius—so often referred to—translated from Greek into Latin,³² we read that it was the most simple of all types of music at that early stage because it consisted entirely of only four pitches. ¹¹So it was called *tetrachordum* because it contained four strings. ¹²The first and fourth strings produced between them the consonance of a diapason, the middle strings together comprised a tone, and produced a diatessaron and a diapente with the outer strings. The following diagram demonstrates all this with the following four letters: ¹³if A to B is a diatessaron, and B to C is a tone, then clearly the distance from A to C must be a diapente. ¹⁴Again, if from B to D we have the distance of a diapente, and the interval between A and B is a diatessaron, then the distance between A and D will be an absolutely perfect diapason.

³¹This reference to Japhet cannot be traced.

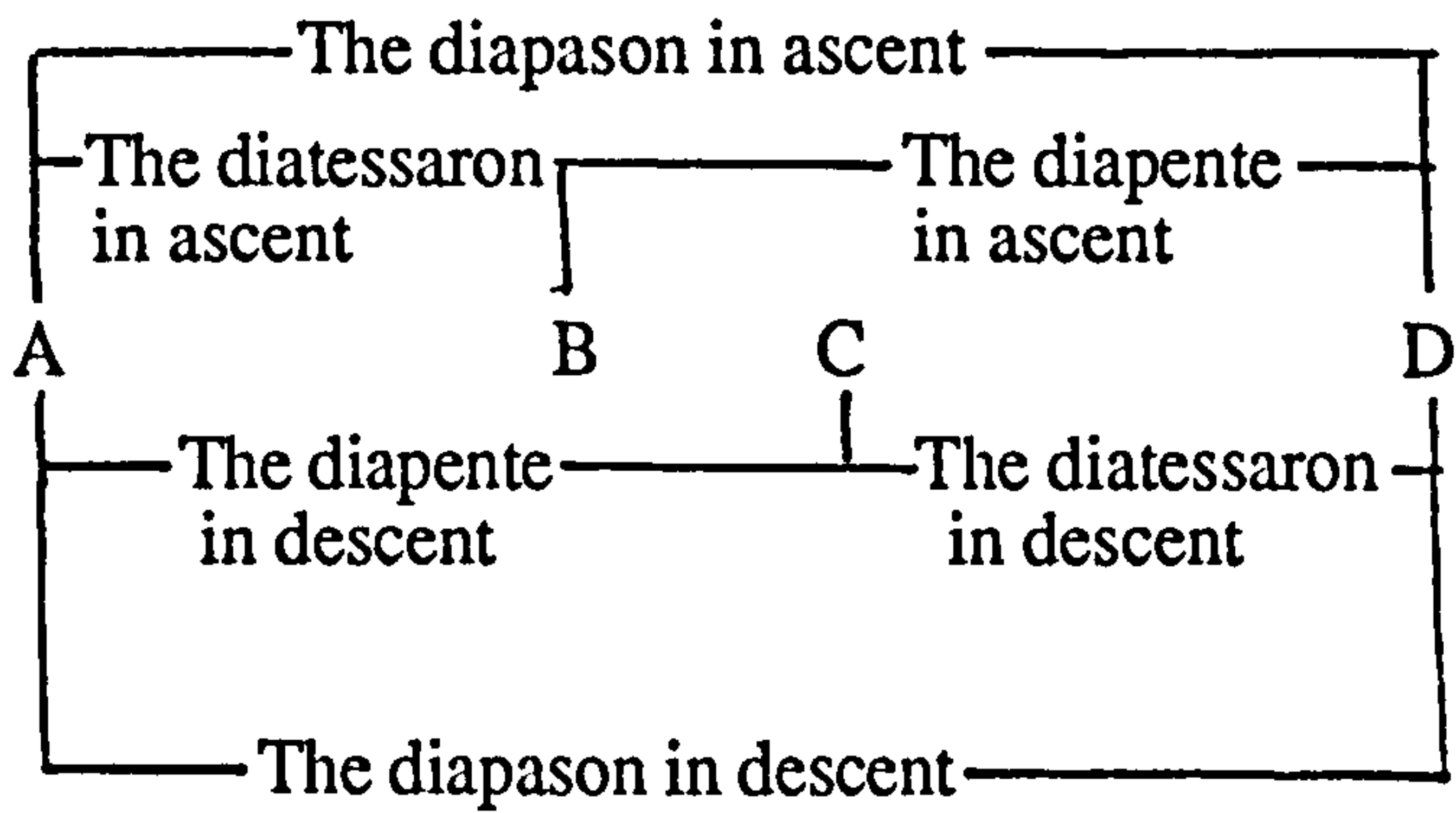
³²The treatise would be Nicomachus's lost *Peri mousikes*, cited in *De inst. mus.* 1,20 (205,28-206,7).*

¹⁵Hoc tetrachordum omnium primum ac vetustissimum creasse Graeci iactitant ac fecisse Mercurium, sed illud magis traditum renovatis hominibus a Noe succe[ssu]ribus, opinor, post diluvium.



in figura: (Diatessaron) intensam A

¹⁵The Greeks claim that Mercury invented and constructed this tetrachord, which is the first and oldest of them all. However, I think that it was handed down after the Flood by the descendants of Noah to humankind which had been given a new lease of life.



¹Capitulum quintum: ²Addidisse philosophos suprascriptis chordis et alias undecim per intervalla temporum, nec unquam illos excessisse quindecim numerum.

³Porro philosophi Graeci quatuor illis nervis adhuc undecim alias apposuerunt chordas per intervalla temporum, quod qualiter aut quomodo si scire cupis, lege Boetium in primo suae musicae libro, ibique reperiēs non id modo quod quaeris, sed ipsorum quoque nomina philosophorum. ⁴Sensati namque viri quod omnis vox aut continua sit aut intervallis suspensa non ignorabant, et idcirco se posse plures adhuc tantillo numero superaddere chordas non dubitarunt. ⁵Attamen quindenum numerum transcendere nunquam voluerunt. ⁶Est enim vox illa continua qua prosas legere solemus et historias verba loquendo verbis subiungere, quae nimirum a sola natura moderari potest ne sit infinita, dum loqui tantum valeat homo seu legere quantum anhelitus eius duret aut queat respirare. ⁷Quae vero dicitur intervallis suspensa vox est qua musicos elevare solent homines aut deprimere sonos; quae quidem et ipsa modum non habet si non refrenetur a natura, nam ultra non gravat homo vocem quam valeat sonos alacriter exprimere, nec adeo si sit prudens scandit in altum ut dubitet deficere. ⁸Quisnam oro fere mortalium, si vocem elevet ultra quintam decimam, fere non deficiat, aut si tantum illam relaxet, confusus non erubescat?

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1. A 4v H 5r
 2. Addidisse philosophos.....Capitulum Quintum *om* H
 3. repies *pro* reperiēs A
 5. valet *pro* valeat A
 7. vero *om* H
 - deprimere *pro* exprimere A
 8. oro *in marg* H oro fere *dele* H

¹Chapter V: ²The philosophers added eleven other pitches at different times to the ones mentioned above: they did not add any beyond fifteen.

³Further, the Greek philosophers added eleven more pitches, at different times, to the four already in existence. If you wish to know the nature of these, and how they arose, you should read the work of Boethius—the first book of his treatise on music.³³ There you will find not only what you seek, but also the names of the philosophers themselves. ⁴Perceptive men as they were, they were aware that all pitch is either continuous or interrupted by means of intervals.³⁴ Therefore, they did not doubt that it was possible to add more pitches to the pre-existent small number; ⁵however, they were never willing to exceed the total of fifteen. ⁶That line which we call 'continuous' is one which we normally use for reading prose passages and for joining words to each other when reciting historical accounts.³⁵ This clearly can be prevented from being infinite only by nature, for a man can speak or read only as long as his breath lasts, or as long as he can catch a second breath. ⁷That vocal line which is referred to as being 'interrupted by intervals'³⁶ is the one which men use to raise or lower musical sounds. This has no limit apart from the fact that it is controlled by nature; for a man does not lower his voice beyond the point at which he can produce sounds effortlessly.³⁷ Nor, if he is sensible, does he sing so high that he is uncertain about reaching it. ⁸I ask you, what man's voice would not break if he raised it higher than the fifteenth pitch, or if he lowered it to the same extent, would he not blush in confusion?

³³*De inst. mus.* 1,20 (206,7ff).

³⁴Cf. *De inst. mus.* 1,12 (199,3-4): Omnis vox aut συνεχῆ est, quae continua, aut διαστηματική, quae dicitur cum intervallo suspensa. Note ambiguity in Latin between 'voice' and 'pitch.'

³⁵Cf. *De inst. mus.* 1,12 (199,5-6): Et continua quidem est, qua loquentes vel prosam oratiorem legentes verba percurrimus.

³⁶Cf. *De inst. mus.* 1,12 (199,4): ... quae dicitur cum intervallo suspensa.

³⁷Cf. *De inst. mus.* 1,13 (200,1-5).

⁹Quod si quis se vidisse voces humanas obiecerit ad praefatum numerum superandum aptissimas, respondemus quod paucae sunt ad totius humani generis comparationem, et de his quae raro accidunt non datur regula generalis.

¹⁰Egit in hoc ergo per omnia prudenter philosophorum auctoritas, quae nobis ad cantandum docendum ac discendum, et omne quod canitur, si velimus describendum, optime providit, nihilque superfluum, aut inepte per incuriam ordinatum reliquit.

9. praefactum *pro* praefatum
A comperationem A

⁹Now if anyone disagrees, and claims that he has encountered human voices easily able to go beyond these limits, we reply that they are very few—relative to the size of the human race—and that we cannot form a general principle from these phenomena which occur so rarely.

¹⁰So the authority of the philosophers has proceeded wisely here in all respects—an authority which has admirably provided for us a means of teaching and learning the art of singing, and a method of describing, if we wish, everything which is sung. It has passed down to us nothing which is superfluous, or any ideas which are inadequately presented because of carelessness.

¹Capitulum sextum: ²Harum quindecim vocabula chordarum ac interpretationes earum.

³Chorda Prima: collectis itaque prout tradit Boetius quindecim tantummodo chordis, primam et omnium gravissimam vocavere philosophi Graece *proslambanomenos*, hoc est 'additam' vel 'appositam' seu 'acquisitam', eo quod quamquam ultima fuerit inventa, caeteris tamen sit necessario praelata.

⁴Chorda Secunda: *Hypate hypaton* idem est quae gravissima gravissimarum, quod quippe vocabulum antequam esset *proslambanomenos* iure sibi competebat, cum tunc esset prima. Nunc vero tenet illud adhuc quamvis illa tono sit altior et secunda.

⁵Chorda Tertia: *Parhypate hypaton* iuxta gravissimam interpretatur gravissimarum, quae cum ab illa solo minori semitonio remota sit, suum optime gerit nomen ac vocabulum.

⁶Chorda Quarta: *Lichanos hypaton* 'index' appellatur non ab re 'gravissimarum', nam cum antiquitus esset in loco tertio distans a secunda chorda tono, mox indici monochordum occurrebat tangenti digito.

1. A 5r H 5r
 2. (chordarum) ut (ac) *dele* A
 4. esse *pro* esset A

¹Chapter VI: ²The terms used for these fifteen pitches, with their meanings.

³The first pitch: I have listed the pitches—only fifteen in number—as Boethius has handed them down to us.³⁸ The first and deepest of them all the philosophers called by the Greek word *proslambanomenos*, which means 'added', 'placed next to', or 'newly-acquired'.³⁹ The reason for this is that although it was the last to be invented, it is of necessity put in front of the others.

⁴The second pitch: the *Hypate Hypaton*. This likewise is the pitch which is the 'lowest of the lowest' because this term was properly appropriate for it before the existence of the *proslambanomenos*. It claimed this term as its right since at that time it was the first pitch. Now, it continues to have this term applied to it, although it is the second pitch and a tone higher than the first.

⁵The third pitch: the *Parhypate Hypaton* means 'next to the lowest of the lowest': as it is positioned only at a minor semitone's distance from it, it well deserves its title and its terminology.

⁶The fourth pitch: the *Lichanos Hypaton* is rightly referred to as 'the index finger of the lowest pitches'. for although in ancient times it occupied the third position at a tone's distance from the second pitch, it subsequently corresponded with the index finger as it touched the monochord.

³⁸For general description of the fifteen pitches, see *De inst. mus.* 1,20; for Boethius's translations of the names of the pitches, see *De inst. mus.* 4,3.

³⁹Boethius refers to the *proslambanomenos* as 'added' (*addita*) in *De inst. mus.* 1,20 (211,22); he further describes it with the term *adquisitam* in 4,3 (309,21). Boethius does not use the term *apposita* with respect to the lowest pitch. Martianus Capella *De nuptiis* likewise uses the term *adquisitus* (9,931). The naming of notes and their interpretations in the following lines does not follow Boethius or Martianus Capella.

⁷Chorda Quinta: *Hypate meson* 'gravissima' recte vocitatur 'mediarum', distans enim a praecedenti vicina tono, sicuti voces finit gravissimas, ita quidem inchoare probatur et medias.

⁸Chorda Sexta: *Parhypate meson* interpretatur 'iuxta gravissimam mediarum', nam ab illa solo scitur distare minori semitonio, quod est initium mediarum et origo.

⁹Chorda Septima: *Lichanos meson* Latine sonat 'index mediarum', quae tono distans a sua praecedenti socia, nomen alterius Lichanos a loci similitudine sortitur ac vocabulum.

¹⁰Chorda Octava: *Mese*, quae dicitur 'Media' iure duplici tale nomen habere debet, a subdita namque sibi vicina tono se tantum elevans, primum finit diapason a principali proslambanomenos vocula, rursusque sedens in loco medio, mater est omnium sequentium vocularum ac domina.

¹¹Chorda Nona: *Paramese* 'iuxta Mese' non immerito dicitur, nam si sit ab illa plus minusve tono remota, nusquam de septem diapason speciebus apparet una.

¹²Chorda Decima: *Trite Diezeugmenon* optime quidem interpretatur tertia disiunctarum, est etenim a mese locum habens tertium, quamquam ad paramese minus reddat semitonium.

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10. quae *om* A
 (rursus) que *supra lin H om* A
 (sequen)tium *supra lin H*
 12. Chorda X H

⁷The fifth pitch: the *Hypate Meson* is rightly called the 'lowest of the middle pitches', for, lying at a tone's distance from its aforementioned neighbour, it forms the limit of the lowest pitches, and is accepted as being the start of the middle register.

⁸The sixth pitch: the *Parhypate Meson* means 'the pitch which is next to the lowest in the middle register', for it is known to lie at a distance of only a minor semitone from that pitch, which forms the beginning, and is the basis of the pitches of the middle tetrachord.

⁹The seventh pitch: the *Lichanos Meson*; this term, in Latin *index mediarum*, means 'the index finger of the middle pitches'. It lies at a distance of a tone from its neighbour mentioned above. It obtains the name and the terminology of the second *Lichanos* because of its similar position.

¹⁰The eighth pitch: the *Mese* which means 'the middle pitch', has to have such a name on two counts. It is only a tone higher than its lower neighbour, and it forms the upper limit of the first diapason, which begins with the principal pitch, the *proslambanomenos*. Further, it occupies a central position, and is the mother, and ruler of all the following pitches.

¹¹The ninth pitch: the *Paramese* is rightly referred to as 'the pitch lying next to the mese', for if it lay at more or less than a tone's distance from it, one of the seven diapason species would in no sense be realized.

¹²The tenth pitch: the *Trite Diezeugmenon* is well translated as 'the third of the disjunct pitches', for it occupies the third position from the mese, but is only a minor semitone's distance from the paramese.

¹³Chorda Undecima: *Paranete diezeugmenon* 'iuxta nete disiunctarum' versa de Graeco significat in Latinum, eo quod triten uno tono superans ad neten quoque tonando semel ascendat.

¹⁴Chorda Duodecima: *Nete diezeugmenon* a verbo Graeco *neate* iuxta Boetium 'inferior' appellatur 'disiunctarum', tono namque praescriptam paranete chordam superans, novissimam omnium disiunctarum vocem emittit atque iuniorem.

¹⁵Chorda Tertia Decima: *Trite hyperboleon* iure 'tertia' nominatur 'superiorum' aut 'excellentium', altius namque solo minori semitonio quam nete vicina sua prodiens, etsi certe graviolem, tertium nihilominus a superiori nete locum occupat.

¹⁶Chorda Quarta Decima: *Paranete hyperboleon* 'iuxta nete' dicitur 'superiorum' eadem ratione qua paranete diezeugmenon, scilicet pro eo quod ad illam per tonum pergat similiter.

¹⁷Chorda Quinta Decima: *Nete hyperboleon* 'inferior superiorum' interpretata probatur eodem argumento quo nete diezeugmenon, videlicet ultima namque superiorum est, sicut illa disiunctarum, soloque tono vicinam sibi subditam superat.

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- | | |
|-----|---|
| 13. | (quoque) semel (tonando) <i>dele</i> H |
| 14. | Chorda XII H |
| | parinete A |
| | vocum <i>pro</i> vocem A |
| 15. | Chorda XIII H |
| | at <i>pro</i> aut A |
| | pergat H |
| 17. | inferior.....diezeumenon <i>in marg</i> A |

¹³The eleventh pitch: the *Paranete Diezeugmenon* means 'next to the nete in the disjunct pitches' when translated from Greek into Latin, because it is higher than the trite by a whole tone, and has to climb a tone to reach the nete.

¹⁴The twelfth pitch: the *Nete Diezeugmenon*, derived from the Greek word 'neate' according to Boethius, is referred to as the lowest of the disjunct pitches,⁴⁰ for it lies at a tone's distance above the previous paranete. It produces the newest and most recent sound of all the disjunct pitches.

¹⁵The thirteenth pitch: the *Trite Hyperboleon* is rightly called the third pitch in the highest or outstanding pitches. It appears at only a minor semitone's distance from its neighbour the nete. Even though it occupies a deeper position, nevertheless it is only three pitches down from the higher nete.

¹⁶The fourteenth pitch: the *Paranete Hyperboleon* is so called because its position is adjacent to the nete in the highest pitches, on the same principle as the paranete diezeugmenon, which similarly travels the distance of a whole tone to reach its neighbour.

¹⁷The fifteenth pitch: the *Nete Hyperboleon* is rightly translated as 'the lowest pitch in the highest pitches' for the same reason as the nete diezeugmenon is so called—because it is the last of the upper pitches, just as the other is the last of the disjunct ones, and is higher than its neighbour underneath it by only a tone.

⁴⁰Cf *De inst. mus.* 1,20 (206,25): ...quasi neate id est inferior. 'Neate' is a Doric variant of 'nete'.

¹Capitulum septimum: ²Has quindecim chordas hic more Graeco per solum genus diatonicum divisas.

³His igitur expeditis, ac quindecim illis phthongorum vocum sive sonorum vocabulis satis ad propositum interpretatis, scire non erit absonum Graecis antiquis, valde curiosis, unam harum quindecim vocum nequaquam suffecisse distinctionem, immo tribus illas permutando tonos ac semitonia distinxere modis, primam utpote modulandi formam genus diatonicum, secundam autem enarmonicum, tertiam vero chromaticum appellantes. ⁴Veruntamen de solo diatonico, quod primum est verum ac perfectum, tractare dispono, quamquam de caeteris etiam duobus in totum silere nolim, captato tempore siquidem et loco congruo. ⁵Mater enim Ecclesia de tribus his generibus solum diatonicum ad omne quod canere velis aptissimum elegit, aliis reprobatis duobus, Deum utique laudare volens ad libitum, idque totum quod curiosum est magisve difficile quam consonum a se reiciens.

⁶Has igitur Graeci quindecim chordas in quatuor primo divisere tetrachordis, primum appellantes tetrachordum hypaton, id est 'gravissimarum', secundum autem tetrachordum meson, hoc est 'mediarum', tertium tetrachordum diezeugmenon, id est 'disiunctarum', quartum autem tetrachordum hyperboleon quod sonat 'superiorum'.

-
- | | |
|----|---|
| 1. | A 5r H 6r |
| 2. | hic <i>supra lin</i> H
(Graeco) divisas (per solum) <i>dele</i> H <i>add</i> A
divisas <i>in marg</i> H <i>om</i> A |
| 3. | Hae <i>pro</i> His A
vocalibus <i>pro</i> vocabulis A |
| 4. | siquidem tempore A
<i>in pro</i> et A |
| 6. | tetrachordum <i>in marg</i> H
est <i>om</i> A |

¹Chapter VII: ²These fifteen pitches at this point are classified in the Greek fashion only by the diatonic genus.

³Having settled these matters then, and having explained, sufficiently well for our purpose, the fifteen terms used for the *phthongi* pitches or sounds, it will not be out of place for us to be aware that, as far as the ancient Greeks were concerned*—and they were a very intellectually curious people—one version of the succession of fifteen pitches was not enough. They therefore distinguished them in three ways by changing the order of tones and semitones. The first type of singing they called the diatonic, the second the enharmonic, and the third the chromatic. ⁴However, I am inclined to deal only with the diatonic type, which is the first truly perfect type, though I would not wish to remain wholly silent about the other two, if there is time, and in the appropriate place. ⁵Mother Church chose only the diatonic type of the three as being the most suitable for what you feel inclined to sing—and rejected the other two. She wished nothing else but to praise God at will while rejecting all that is laboured, or is too difficult to be pleasing to the ear.

⁶These fifteen pitches then the Greeks divided up into four tetrachords ⁴¹ They called the first *Tetrachordon Hypaton*—that is, the one made up of the lowest pitches. The second was called *Tetrachordon Meson*, containing pitches in the middle register. The third they called *Tetrachordon Diezeugmenon*—the Tetrachord of the Disjunction. The fourth was the *Tetrachordon Hyperboleon* containing the highest sounds.

⁴¹*De inst. mus.* 1,20.

⁷Contemplantes namque philosophi solis tribus diatessaron differentiis inesse totam harmoniae virtutem—quicquid enim ultra fit replicatur et unum est—omnem istius modi per illam divisere vocum ordinem, duo simul tetrachorda connectentes, quibus tres exprimi probantur illius varietates. ⁸Nil aliud enim est hic tetrachordum quam perfecta consonantia diatessaron. ⁹Est autem eius prima species ab hypate hypaton in hypate meson secundum Graecos, quae currit per minus semitonium et tonum et tonum, et hoc, ut dixi, per solum genus diatonicum. ¹⁰Secunda vero pergit a parhypate hypaton ad parhypate meson, per tonum et tonum ac minus semitonium, a lichanos autem hypaton in lichanos meson tertia, currens utique per tonum ac minus semitonium atque tonum. ¹¹Cernis ergo quod sumant hic a semitonio minori tetrachorda semper exordium, quodque primum sit ab hypate hypaton in hypate meson, cui connectitur, ut patet in hac figura, statim secundum.

(Figura in pagina 176)

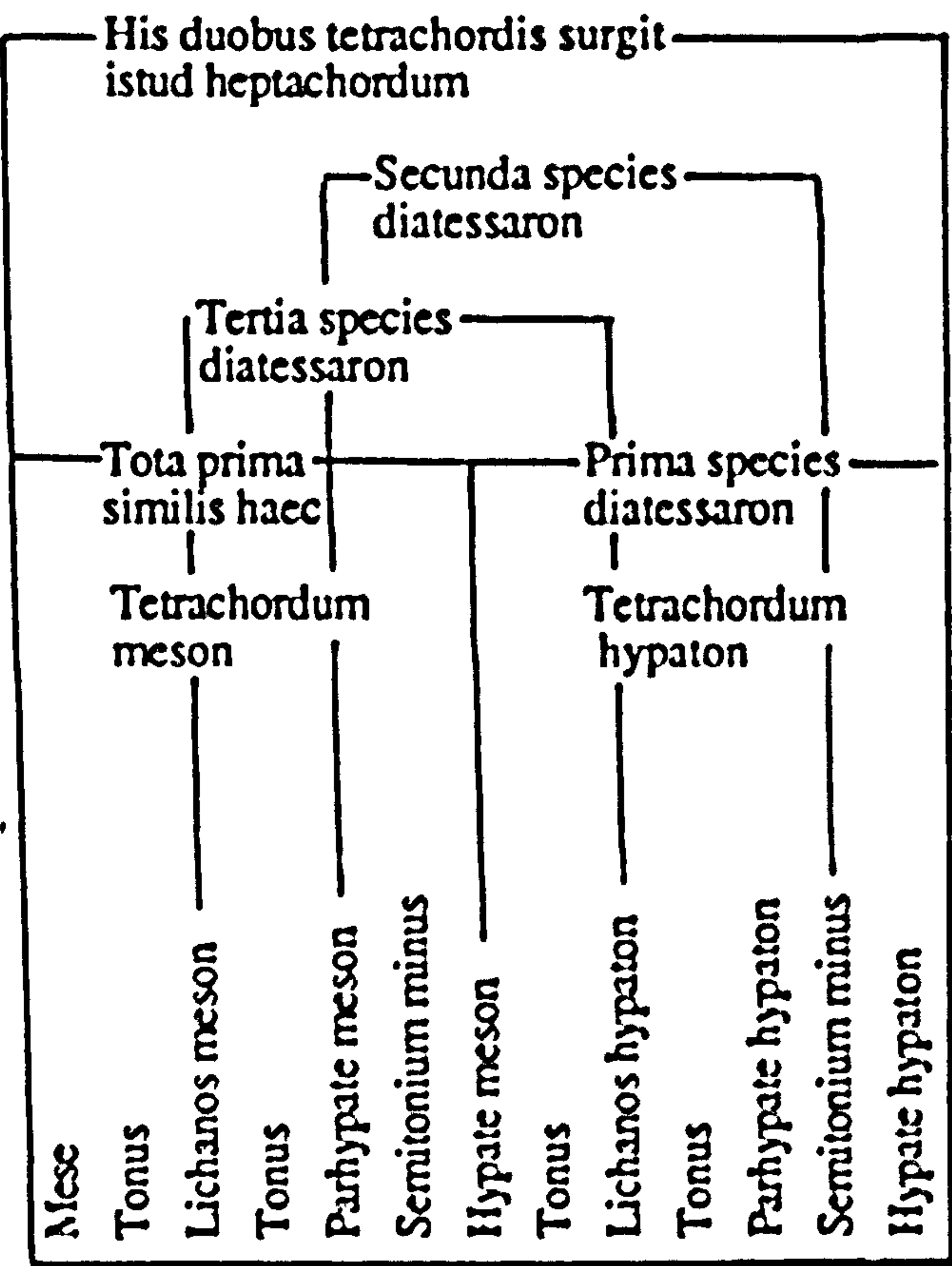
7. omnem *om* A
 8. Nihil *pro* Nil A
 hic *supra lin* H
 11. (quod) que *om* A
 (hypo)te (hypaton) *om* A

⁷The philosophers believed that the entire virtue inherent in the tonal structure lay solely in three species of diatessaron—for whatever lies beyond that range is a duplication and a reiteration—and they divided up every such order of pitches by this scheme, connecting together two tetrachords, by means of which three varieties of structure are produced. ⁸Here, the tetrachord is nothing but the perfect consonance of a diatessaron. ⁹The first species of diatessaron extends, according to the Greeks, from the hypate hypaton to the hypate meson.⁴² It progresses as follows: minor semitone, tone, tone, and this, as I have said, applies only in the diatonic genus. ¹⁰The second species extends from the parhypate hypaton to the parhypate meson, using the following order: tone, tone, minor semitone. The third extends from the lichanos hypaton to the lichanos meson in this order: tone, minor semitone, tone. ¹¹You see therefore that here the tetrachords always begin with the interval of a semitone, and that the first tetrachord extends from the hypate hypaton to the hypate meson, to which is connected conjunctly the second tetrachord, as the following diagram makes clear.

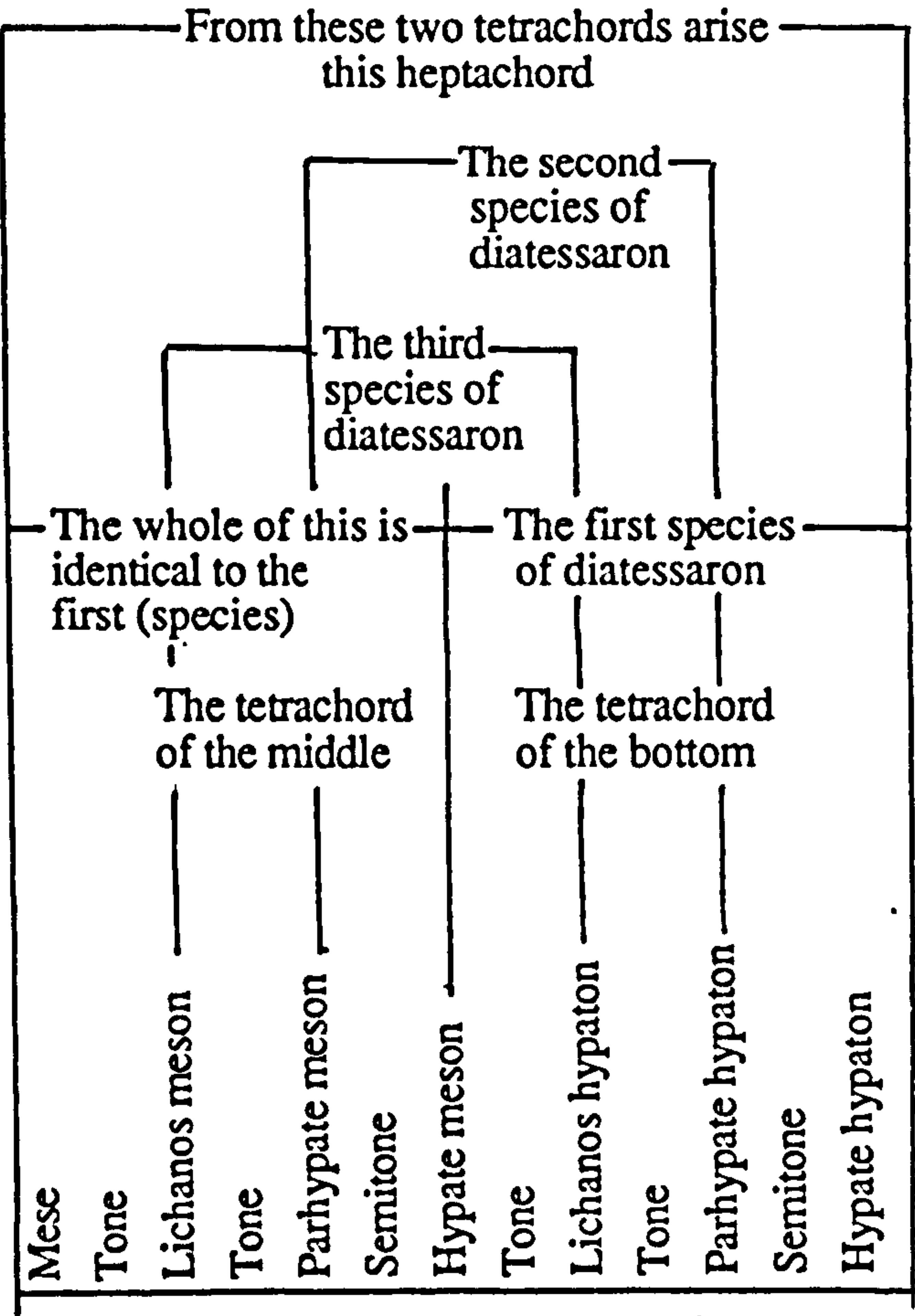
(Diagram on page 177)

⁴²The ordering of species follows Boethius's second ordering of species, that more consistent with traditional Greek theory: see *De inst. mus.* 4,14 (339,12-15), and Bower/Boethius p. 151, n. 76. The order "according to the Greeks" may be found, for example, in Cleonides *Eisagoge* 9 (JanS. p. 195-98), and Ptolemy *Harmonica* 2,3,50.

¹²Omne quidem tetrachordum est sola diatessaron, sed si duo coniunxeris, mox tres diversas efficis; quarta namque replicatur ut hic recte comprobatur, nec illud quod est simile diversum dicitur.



¹²Every tetrachord is made up of one species only of diatessaron, but if you join two tetrachords together, you quickly produce three species. The fourth is a repetition, as is rightly pointed out here, and what is identical is not referred to as different.



¹Capitulum octavum: ²Alia duo tetrachorda primis duobus simillima;
cur sint ab illis per unum tonum disiuncta.

³Hic natura rerum satis exercuit solertiam philosophorum: aut certe coacti sunt in duas partes tonum secare, vel humanas aures trium discordia tonorum sibi succedentium vehementer offendere. ⁴In illo enim quem supra depinximus heptachordo diapason haberi non potest, eo quod ibi sint septem tantummodo chordae sive voces, ipsa vero consonantiarum consonantia minus quam octo chordas habere non debet. ⁵Graeci namque proslambanomenos nunquam in divisione vocum annumeraverunt, quoniam divisus iam longo tempore chordis ab hypate hypaton, quae tunc erat prima sicut hic ponitur, ad complendum bisdiapason, et illa, prout in eius interpretatione tactum est, illi superadditur.

⁶Cum ergo proslambanomenos, quae prima nunc est omnium, ad eam quae prima prius erat tonum semper habeat, et ad eam chordam quae media dicitur, optimum diapason efficiat, quod et illa chorda quae mese sequitur, ab ipsa tono distet integro necesse est. ⁷Alioquin una de septem diapason speciebus tota perit, et si servaveris eam, trium tonorum, ut dixi, discordiam pessimam incurris. ⁸Cum tribus namque tonis contiguis humanae naturae concordia non est. ⁹Qua de causa, philosophi totis diebus altercari maluerunt cum tritono quam unam de septem diapason auferre de numero.

1. A 6r H 6v
2. simillia *pro* simillima A
4. diximus *pro* depinximus A
habere *pro* haberi H

¹Chapter VIII : ²Two other tetrachords, which had the same structure as the first two: why they were separated from them by the interval of a tone.

³At this stage, the facts of nature were enough to tax the ingenuity of the philosophers: there is no doubt that they were compelled either to divide the tone into two parts, or violently offend human ears with the dissonant interval produced by the succession of three tones.⁴³ ⁴For a diapason cannot be contained within the heptachord which we have described above, because the latter possesses only seven pitches or pitches. Also, the most perfect consonance needs to contain no fewer than eight pitches. ⁵The Greeks never included the proslambanomenos in their classification of sounds until, as is mentioned in Boethius' account, it was added on to the hypate hypaton to complete the bisdiapson.⁴⁴ For some time, the pitches themselves had been classified starting with the hypate hypaton—which at that time was the first pitch—which is how it is placed here, in the preceding diagram.

⁶Since therefore the proslambanomenos, which is by this time the first pitch, always lies at a tone's distance from the pitch which used to be the first, and since it produces a perfect diapason with that pitch which is called the mese, it is necessary that the pitch following the mese lies at a tone's distance from it. ⁷In the absence of the proslambanomenos, one of the seven diapason species is entirely destroyed; and if you retain it, you produce the dissonance of the interval produced, as have said, by three successive tones, the worst possible one. ⁸For human nature has no agreement with three whole tones adjacent to each other. ⁹For this reason, the philosophers preferred to argue with the tritone all the time rather than be deprived of one of the seven diapason species.

⁴³For Johannes' suppositions on the Greek view of the tritone, see below, *Pars prima* 1.9.14.

⁴⁴See *De inst. mus.* 1,20 (211,21ff). I assume here *eius* refers to Boethius's account.

¹⁰Hinc est quod sequentem paramese chordam ab ipsa mese per tonum integrum elongarunt, tertiumque tetrachordum a primis duobus seiunctum et cum quarto sequenti ligatum diezeugmenon, hoc est disiunctum, nominant, sicque durum a parhypate meson in paramese vilipendentes tritonum, optimam ab hypate hypaton in eandem paramese diapason conservant.

¹¹Tonus ergo soluit hic tetrachordum tertium a chorda mese tritonum generando, quod ligare poterat cum caeteris minus semitonium dulcisonam diapason enervando, pergens videlicet a paramese versus nete diezeugmenon, ut alia tetrachorda per semitonium minus, tonum et tonum. ¹²In qua nete chorda siquidem et quartum tetrachordum huic tertio connectitur, non aliter quam et illa duo prima simul in hypate meson connexa sunt, tenditque similiter ad nete hyperboleon chordam ultimam per minus semitonium, tonum ac tonum.

¹³Nullamque prorsus inter haec quatuor tetrachorda video distantiam, cum et ista duo tres diatessaron demonstrent species sicut et illa, nisi quod ibi tantummodo graves, hic autem acutae voces resonent.

¹⁴Quod totum esse verum hic depicta probabit figura.

(figura in pagina 182)

-
- 10. tertium namque A
est *supra lin A*
 - 12. huic *supra lin H*
in *om A*
 - 13. (prorsus) est *dele H om A*
video *om A*
 - 14. apparebit *pro* probabit A

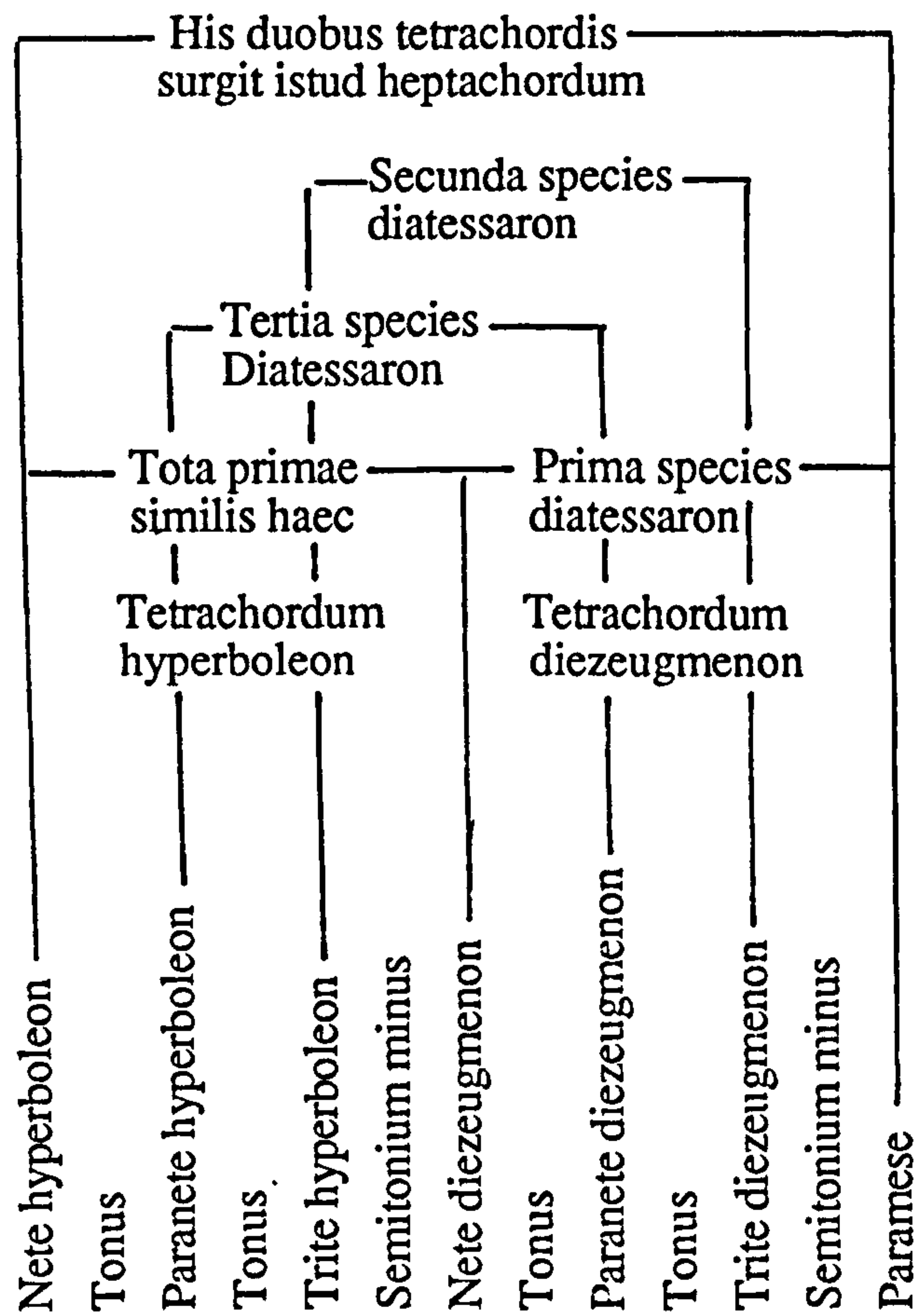
¹⁰It was for this reason that they separated the following pitch—the paramese—from the mese itself by the distance of a whole tone. To the third tetrachord they applied the term *diezeugmenon* which means 'disjunct', for it was separated from the first two tetrachords, and joined to the fourth which followed it. Thus, they preserved the perfect diapason extending from the hypate hypaton to the same paramese, paying little regard to the harsh tritone between the parhypate meson and the paramese.

¹¹The distance of a tone therefore separates here the third tetrachord from the mese, thus creating the interval of a tritone; were it to be joined by a minor semitone to the rest, this would result in the weakening of the sweet-sounding diapason. This tetrachord then extends from the paramese to the nete diezeugmenon - like the other tetrachords, in that it contains the progression minor semitone, tone, tone. ¹²At this nete, the fourth tetrachord is joined to the third, in the same way as the first two tetrachords are joined at the hypate meson; it extends to the nete hyperboleon—the last pitch—in a similar way, using the progression minor semitone, tone, tone. ¹³I myself see no difference at all between these four tetrachords, since both pairs produce the three species of diatessaron; however, there is the fact that one pair produces only deep pitches, and the other high.

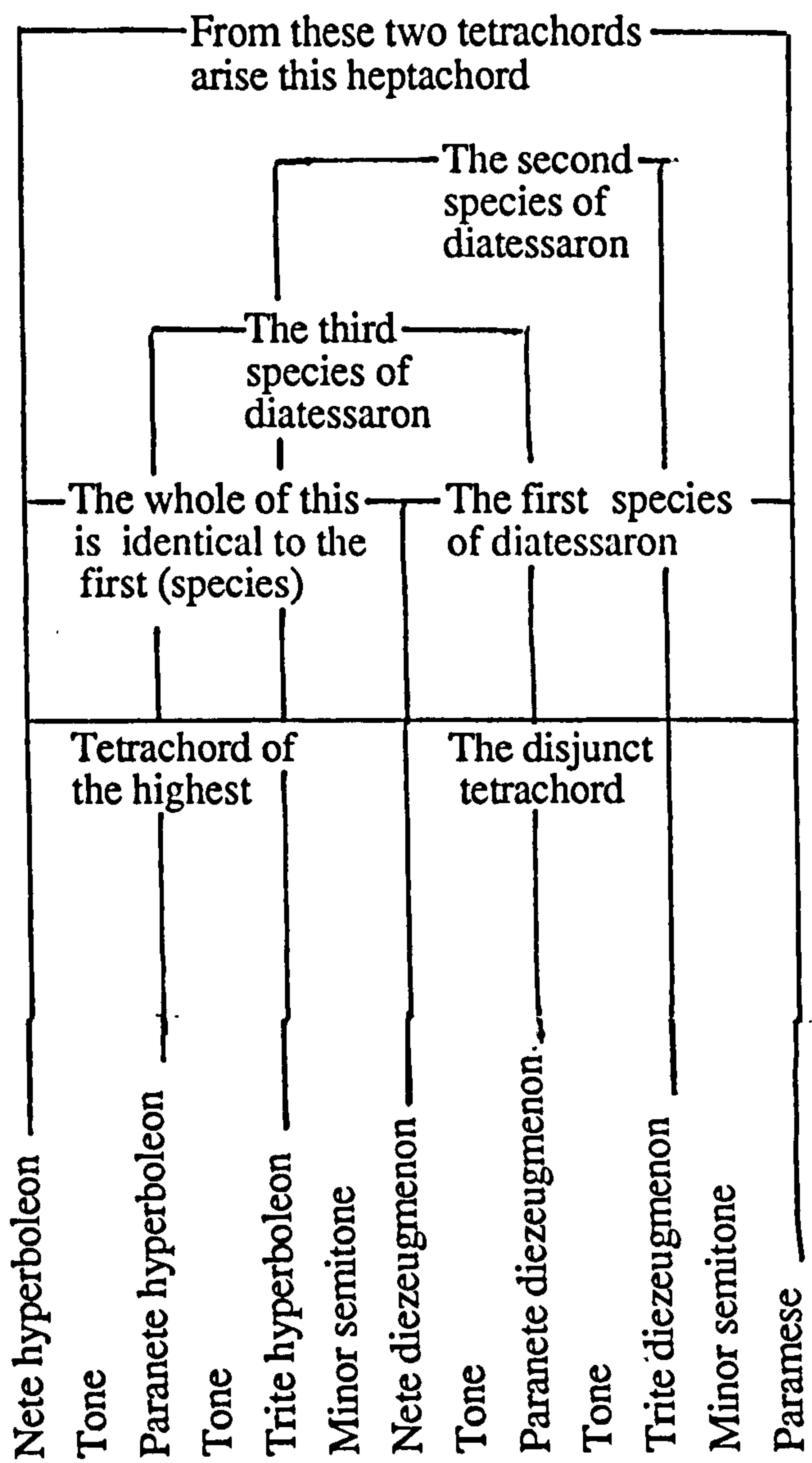
¹⁴The diagram which I have drawn here will prove all this to be true.

(Diagram on p. 183)

Haec duo ligata simul sunt caeteris simillima, nisi quod voces acutas occupant et illa graves; in quo quidem ostenditur quod quicquid voces resonant, totum quippe dirigitur triplici diatessaron.



15These two conjunct tetrachords are totally identical to the others, apart from the fact that these occupy a high register, and the others a low one. It is this fact which demonstrates that whatever the pitches sound, the whole is controlled by the three species of diatessaron.



¹Capitulum nonum: ²Cur quintum sit inventum tetrachordum et cum
chorda mese ligatum.

³Nunc autem ad id quod de tribus tonis contiguis supra motum est convertere
stilum nos oportet. ⁴Circa quod primo quaerendum est ad quid philosophi
Graeci quintum illis quatuor addere voluerunt tetrachordum, et cum satis
allegata mese chorda totaliter connectere, cum praesertim illa quatuor sufficiant
ad canendum tetrachorda, sic, ut vides, in optimo genere diatonico distincta,
tamque decenter per diapason ac diapason simul adunata. ⁵Videtur praeterea
superfluum ac inane totum istud tetrachordum, quoniam etsi nomina mutata sint
chordarum, est tonus identidem et tonus inter triten paraneten netenque
synemmenon, sicut inter triten paraneten ac neten diezeugmenon erat. ⁶Sed si
rem diligenter consideremus, non parvam inter has chordas differentiam esse
videmus. ⁷Providi namque philosophi, trium illorum tonorum discordia, quae
cadit a parhypate meson in paramesen, concitati, rursus et aliam inter mesen et
paramesen constituere chordam triten synemmenon, hoc est, tertiam
coniunctarum illam ea de causa qua et triten hyperboleon vocitantes. ⁸Quae
procul dubio tonum ab ipsa mese in paramesen secatur et dividit, sed non
aequaliter, dum ad mesen minus reddit semitonium, et ad parhypate meson per
consequens non iam tres tonos successivos, immo veram diatessaron generat.

-
- | | |
|----|---|
| 1. | A 6v H 7v |
| 2. | inventum sit A |
| 4. | quatuor <i>om</i> A |
| 5. | propterea <i>pro</i> praeterea A
ac ² <i>om</i> A |
| 7. | mesem et paramesem A |

¹Chapter IX: ²Why the fifth tetrachord was invented, and why it was joined to the mese.

³It is necessary now to devote some of my text to what we mentioned above concerning the three adjacent tones. ⁴With regard to this, we must first ask ourselves why the Greek philosophers wished to add a fifth tetrachord to the other four, and join it conjunctly to the mese, a pitch I have mentioned enough already, since these four tetrachords are more than adequate for singing purposes, set out thus, as you can see, in the excellent diatonic genus, and combined together so aptly between one diapason and another. ⁵Further, this tetrachord seems to be totally useless and superfluous, because even if the names of the pitches are changed, there is still a progression of two tones between the trite, the paranete and the nete synemmenon, likewise between the trite, the paranete and the nete diezeugmenon. ⁶But if we consider the matter carefully, we see a considerable difference between these pitches. ⁷The philosophers, provident as they were, were disturbed by the dissonance produced by the three tones which occurs between the parhypate meson and the paramese. They placed another extra pitch between the mese and the paramese—that is, the trite synemmenon—the 'third of the conjunct pitches'. They named it on the same basis as the term adopted for the trite hyperboleon. ⁸Clearly, this cuts and divides into two parts the whole tone which lies between the mese and the paramese—but not into equal halves. The pitch lies at a minor semitone's distance from the mese; consequently, the distance to the parhypate meson is not now three successive tones, but rather a true diatessaron is produced.

⁹A paramese vero distat apothome, quod est maius semitonium, idque totum non cernitur solum oculo, sed et manu de facili tangitur in monochordo.

¹⁰Quotiens ergo necesse est hoc uti quinto tetrachordo, relictis tetrachordi diezeugmenon chordis, totiens naturalem deserere paramesen, et hanc arte factam triten synemmenon recipere nos oportet; ¹¹tuncque tonum inter ipsam et paraneten synemmenon quae prius trite diezeugmenon erat proferre, rursusque tonum ab ipsa paranete synemmenon ad neten synemmenon quae chorda paranete diezeugmenon fuerat, ut ad tempus tetrachordo disiunctarum seposito quod naturale totum est atque facillimum, quintum istud difficile recipiatur quod currat etiam per minus semitonium ac tonum et tonum. ¹²Difficile dico quidem et non naturale quoniam, ut vides, arte quadam hic tonus, quod pauci capiunt, dividitur, minorique semitono cum chorda mese ligato, maius quod et apothome cum sequenti disiunctarum minori semitono iungitur. ¹³Hanc itaque Graeci maluerunt cum pessimo tritono iugem habere colluctationem quam unam, ut dixi, non posse describere diapason speciem, nec ab eis ob aliud tetrachordum istud synemmenon est cum chorda mese copulatum, nisi quo tanta trium tonorum duritia mutaretur in diatessaron perfectam.

¹⁴Quid amplius? Tolle, si potes, tritonum, et nil valet istud tetrachordum.

¹⁵Quo viso, melius est ipsum ab aliis naturalibus atque semper necessariis tetrachordis, ut hic depingendo seiungere, quam ab eo quod per se clarum est intricare.

-
10. naturalem *in marg* H
 paramesem A
 recipere..... paranete synemmenon *in marg* A
11. ad nete synemmenon *om* A
 chorda *scripsi* chordam HA
12. quod pauci capiunt *in marg* H
 et² *om* A
14. potesses A

⁹The pitch lies at a distance of an apothome from the paramese, that is, a major semitone. This can not only be wholly seen by the eye, but easily produced by fingering the monochord. ¹⁰Whenever we find it necessary to use this fifth tetrachord, then we have to abandon the pitches in the disjunct tetrachord, and by the same token, dispense with the natural paramese and replace it with the trite synemmenon, which is created by artifice. ¹¹Then it was necessary to produce the distance of a tone between this pitch and the paranete synemmenon—previously the trite diezeugmenon—likewise a tone between the latter and the nete synemmenon—previously the paranete diezeugmenon. Consequently, having set aside temporarily a totally natural and easy concept, that is, the disjunct tetrachord, the difficult fifth tetrachord was accepted, which was likewise made up of the progression semitone, tone, tone. ¹²I emphasize that this is a difficult and unnatural feature, for as you see, by means of certain skilful procedures, the whole tone is at this point dividend into two segments, a point which few appreciate; the minor semitone joins itself to the mese, and the major—that is the apothome—is joined to the minor semitone with the next of the disjunct pitches. ¹³And so the Greeks preferred to be involved in this continuous battle with the dreadful tritone rather than not be able, as I have said, to realize one of the diapason species. There was no other reason to join this other tetrachord, that is the synemmenon, with the mese than to change the considerable dissonance produced by three tones in succession into a perfect diatessaron.⁴⁵

¹⁴What more is there to say? Take away the tritone, if you can, and this fifth tetrachord has no validity. ¹⁵Now that I have clarified this point, it is better to separate this from the other natural, and totally necessary tetrachords, by describing it as I have done here, rather than, because of it, complicate a matter which, in itself, is quite self-evident.

⁴⁵Concerning this extended argument concerning the synemmenon tetrachord and the tritone, see Introduction, pp. 42-44.

16Istud quintum tetrachordum totum erit superfluum, si non discors ac nimius nobis occurrat tritonus quem delet diatessaron.

Prima species diatessaron	
Tetrachordum synemmenon id est, coniunctarum	
Nete synemmenon	Paranete synemmenon
Tonus	Tonus
	Trite synemmenon
	Semitonium minus
	Mese

¹⁶The fifth tetrachord will be totally superfluous, if the tritone does not strike us as discordant, and excessively so. This diatessaron does away with this tritone.

The first species of diatessaron	
Tetrachord 'synemmenon' that is, of the conjunct pitches	
Nete synemmenon	
Tone	
Paranete synemmenon	
Tone	
Trite synemmenon	
Minor semitone	
Mese	

¹Capitulum decimum: ²Ad sonitum malleorum Tubal-Cain; Jubal
concepisse totam in numeris musicam consistere.

³Quoniam de diviso tono mentionem fecimus ac de monochordo, putavi non
esse vanum parumper ad Jubal redire, quoque ritu subiectam invenit esse
numeris musicam breviter aperire, quatenus in hoc saltem me vidisse Boetii
musicam evidenter appareat ac eius arithmetica non nescisse, et priusquam
dispersa superius illa quinque simul aggregentur tetrachorda, viso quod nil a me
loquar aut novi quippiam de proprio cerebro cudam, lector lectioni fidem
adhibeat, et si forsán dubitaverit, ad fontem relicto rivo properet. ⁴Jubal igitur
ille dum iam multis diebus, uti credendum est, a natura cantasset, aliosque suos
coevos ad id ipsum provocasset, non ei suffecit sonos auditu tantum
discernere, quin potius coepit paulisper in dies meditando causas inquirere.
⁵Qui cum apud se talia crebro cogitaret, ac omnino cur sic soni permixti
consonent aut dissonent investigare vellet, audit una dierum super incude fratris
sui Tubal-Cain, qui faber erat, resonare tonum, diatessaron, diapente, simulque
diapason, et ait: "Mutate quaeso malleos ac iterum percutite, non enim parvum
aut in vestris brachiis aut in ipsis malleis latere sentio naturae secretum".

-
- | | |
|----|---|
| 1. | A 7r H 8v |
| 3. | evidenter <i>in marg</i> H
(quinque) tetrachorda <i>dele</i> H
(viso) quoque <i>add</i> A
letor A
forsan <i>in marg</i> H |
| 4. | coevos suos A
sufficit A
tantum auditu A
cepit A |
| 5. | aut <i>pro</i> audit A
simul cum <i>pro</i> simulque A |

¹Chapter X: ²Regarding the sound of the hammers of Tubal-Cain; Jubal discovers that music consists entirely of numbers.

³Since I have mentioned the division of the whole tone, and also the monochord, I thought it not a waste of time to return to the subject of Jubal for a while, and to show briefly how he discovered music to be subservient to number. To this extent at least it should be clear that I have consulted the *De Musica* of Boethius, and that I am familiar with his *De Arithmetica*.. Before the five tetrachords—treated separately above—are brought together as a single topic, let the reader—seeing that I say nothing on my own account, or forge any new idea in my own mind—accept on faith what he reads: and, if he entertains any doubts, let him return directly to the source and abandon the rivulet.⁴⁶

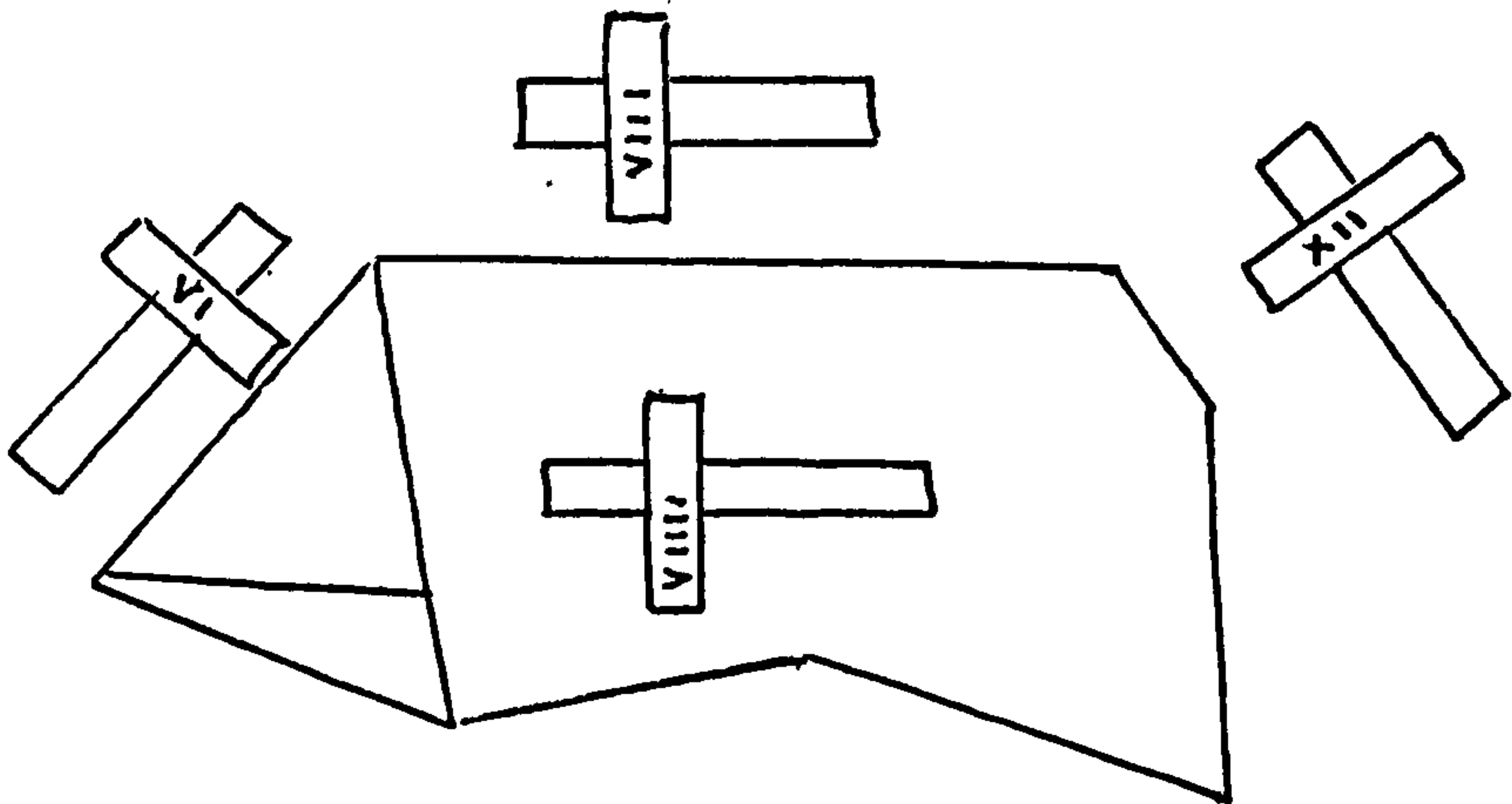
⁴Jubal⁴⁷ therefore, we must assume, had been singing naturally for many days, and encouraging his contemporaries to do the same. At this point, it was not enough for him to distinguish the pitches by ear alone; rather he began, as the days went by, to turn gradually to enquiring into the reasons for these phenomena. ⁵His thoughts turned to such matters frequently, and he was generally interested in investigating why combinations of sounds were either consonant or dissonant. One day, he heard the sound of the tone, the diatessaron, the diapente and the diapason at the same time upon the anvil of his brother Tubal-Cain, who was a blacksmith. He said to his brother: "Please change the hammers around, and strike again, for I feel that a wonderful secret lies either in your arms, or in the hammers themselves".

⁴⁶This passage concerning faith on the part of the reader may represent a literary topos modelled on similar passages in *De inst. mus.*, 1,19 (205,19ff) and 1 33 (222-23).

⁴⁷The narrative of this chapter rather closely follows *De inst. mus.* 1,10, but name of Jubal is substituted for that of Pythagoras—as noted by Johannes himself in sentence 10 below. The same Christian tradition of substituting Jubal or Tubal Cain for Pythagoras can be traced back to Egidius of Zamora (fl. ca. 1260-80), see GS2, p. 372a. Burtius (*Florum libellus*, p. 76) makes Pythagoras the hero of the legend.

⁶Dubitavit siquidem vir sensus habens ob longam aetatem exercitatos ne causa tantae novitatis quam aure captabat inesset ferientium viribus, sed nec sic aliud ibi concipiens quam quod ante senserat, malleos concitus ponderavit. ⁷Quo facto, singula singulis comparans pondera malleis, quosdam ab invicem duplo distareprehendit numero, quosdam autem epitrito sive sesquitertio, quosdam nec non sesquialtero, sed et quosdam simul sesquioctavam reddere vidit proportionem. ⁸Exempli gratia: si quis libras duodecim ad novem comparet, mox proportionem sesquiterciam habet, sed si novem ad octo sesquioctavam, et si rursus duodecim ad octo sesquialteram, quod si duodecim ad sex consideret, invenit duplam. ⁹Haec autem subiecta demonstrat figura quae solus musicus capere solet, nam qui se musicum reputat ignorans arithmetica, haud secus quam si se rhetorem praedicet nesciens grammaticam.

¹⁰Tradunt Graeci Pythagoram invenisse figuram, sed magis puto consonum opinari dictum Jubal suum fratrem Tubal-Cain frequentasse fabricantem, qui ferro pater extitit ac aere malleantium.



-
6. inesse A
 7. deprehendit *in marg* H
 8. (consideret) et *add.* A
 9. solis musicis A

⁶Jubal was a man whose senses were sharpened by the long passage of time, and he doubted that the reason for this new experience which was reaching his ears lay in the strength of the beaters themselves. However, though he did not imagine that there was any factor other than what he had previously observed, in a state of excitement, he weighed the hammers. ⁷Having done this, he compared the weight of each hammer, and discovered that some were twice the weight of others. Some produced the ratio 4:3, some the ratio 3:2, and others 9:8. ⁸For example, if one balances twelve pounds against nine, one easily arrives at the ratio 4:3. Again, nine pounds in relation to eight produces the ratio 9:8. Twelve pounds set in relation to eight produces the ratio 3:2, and twelve pounds in relation to six the ratio 2:1.* ⁹The following diagram explains these laws, which only the musician can grasp. For the person who considers himself to be a musician, while he at the same time is ignorant of arithmetic, can be compared to the person who claims to be an orator, but has no knowledge of grammar.

¹⁰It is traditional amongst the Greeks to claim that Pythagoras invented this diagram, but I think it is a more convincing idea to believe that the said Jubal visited his brother Tubal Cain the blacksmith, who was reputed to be the father of those who forge with iron and with bronze.

¹Capitulum undecimum: ²Quibus proportionibus numerorum Jubal adaptari voluit consonantias vocum atque sonorum.

³At Jubal, his cognitis, non nesciens voces acutas e pluribus ac velocioribus quam graves fieri motibus, omnemque pluralitatem ad paucitatem non aliter haberi quam si numerus comparetur ad numerum, in epitrito numero iudicat esse diatessaron consonantiam, eo quod illam inter duos eiusdem numeri malleos aure concepisset, motusque suos se sic invicem habere non ambigit tam graves quam acutos. ⁴Certus quoque per arithmetica ex epitrito numero et sesquioctavo gigni sesquialterum, in illo tonum, et in hoc diapente constituit, iuxta quod in malleis talium proportionum resonare praesenserat. ⁵Et quidem bene, scimus enim ex diatessaron et tono diapente fieri, et ex sesquitercia cum sesquioctava sesquialtera generari, propter quod necesse est ut tonus sesquioctavam et diapente sesquialteram occupet. ⁶Porro duplam inveniens proportionem ubi dulcis diapason resonabat in malleis, totam in duplo numero naturam eius esse censuit, cum praesertim diapente cum diatessaron aut e converso componere diapason aspiceret, quemadmodum epitritus numerus et sesquialter duplum generat, quod totum sequens figura monstrabit.

1. A 7v H 9r
 2. voluit adaptari A
 4. proportionem A
 praesenserat (praesenserat) *dele* H

¹Chapter XI: ²With which numerical ratios Jubal wished to relate the consonances produced by sounds and pitches.

³Having made these discoveries, Jubal became aware that high pitches are produced by more and faster vibrations than are deep pitches; also that every greater quantity has the same relation to a smaller quantity as one number has in relation to another.⁴⁸ He decided that a diatessaron was produced by the numerical ratio 4:3, because he had heard this interval produced by hammers of the same numerical ratios; he was sure that the low and the high vibrations had the same interrelation. ⁴He established too, using arithmetic, that the ratios 4:3 plus 9:8 produce the ratio 3:2. He established that the 9:8 ratio produced a whole tone, and the 3:2 ratio a diapente, according to what he had previously realised to be happening with hammers of the same relative sizes. ⁵And indeed he did well; for we know that a diapente is made from the combination of a diatessaron and a whole tone, and that the 3:2 ratio is produced from 9:8 plus 4:3. Consequently, it must be that the 9:8 ratio produces a whole tone, and that the 3:2 ratio produces the diapente. ⁶After this, he discovered the 2:1 ratio—that is when the sweet diapason sounded on the hammers—and he decided that its entire nature depended upon this duple ratio, especially since he saw that the combination of diatessaron and diapente—or vice versa—constitute a diapason, just as the 4:3 ratio added to the 3:2 ratio produces the 2:1 ratio. The following diagram will make clear all of this.

⁴⁸Cf. *De inst. mus.* 1,3 (190,21-30): ...acutae voces spissioribus et velocioribus motibus incitantur ... Ex pluribus enim motibus acumen quam gravitas constat. In quibus autem pluralitas differentiam facit, ea necesse est in quadam numerositate consistere. Omnis vero paucitas ad pluralitatem ita sese habet, ut numerus ad numerum comparatus.

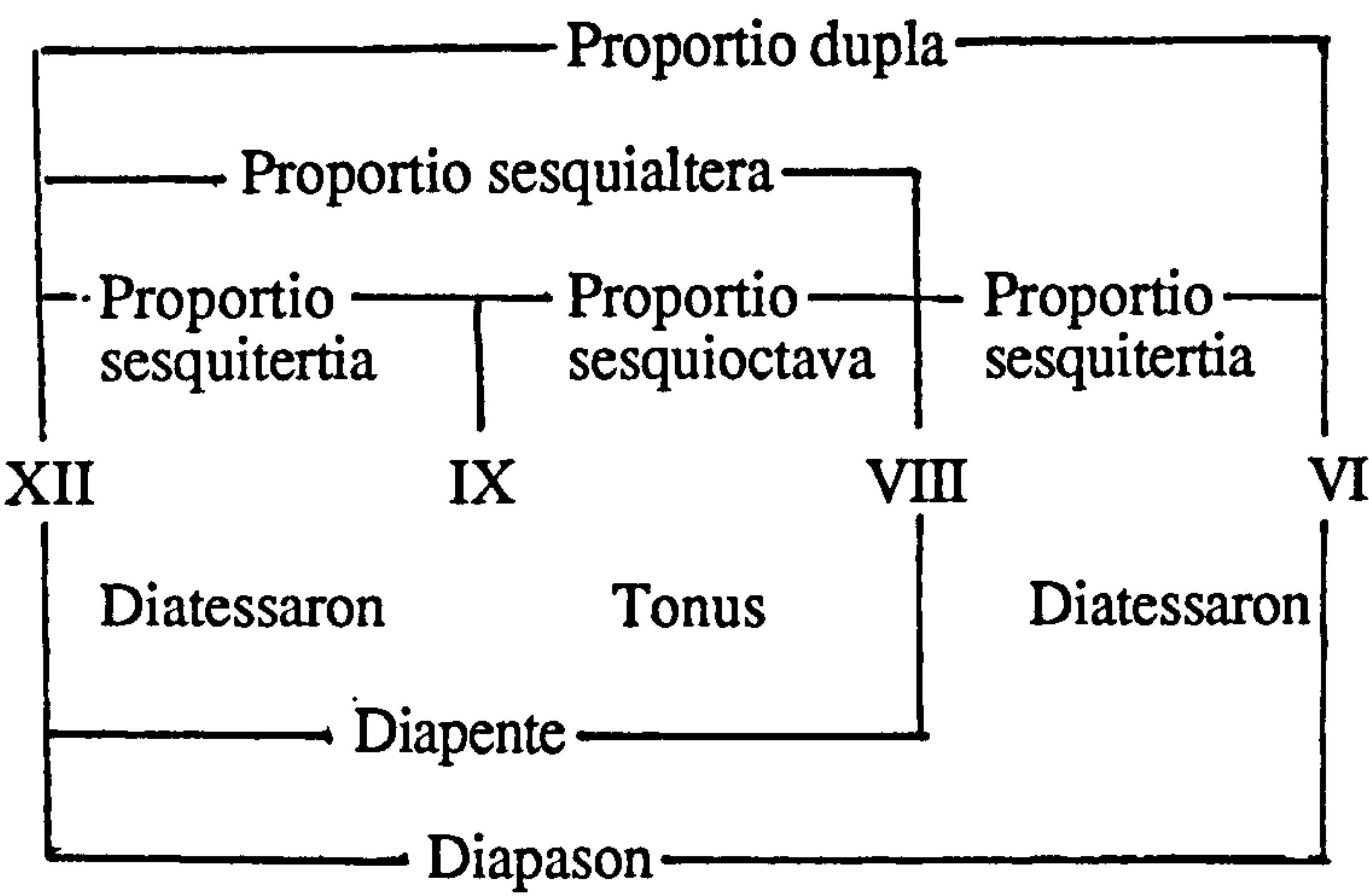
⁷Hic est tonus, haec diatessaron, haec diapente et haec diapason quae profecto veris suis partibus aequis ac integris totam monochordi metiuntur chordam, neque sunt aliae phthongorum vocum aut sonorum aggregationes quae tantam arrogare sibi praesumant omnino gloriam. ⁸De quo quippe monochordo post haec disputare cogito, monstrare volens oculo tonum ac diatessaron cum reliquis perfectis consonantiis nonnisi per praefatas proportionales in chorda posse creari vel resonare, videlicet per duplam, per sesquialteram, per sesquiterciam, ac per sesquioctavam proportionem, partes quoque toni principales esse maius atque minus semitonium palpare velle disponens, nec ullatenus in aequa tonum ipsum dividi. ⁹Nullum enim est aliud penes musicos ita verum approbans instrumentum, et hoc propter continuum ibi varie per praescriptas proportionales ac iustissime compartitum. ¹⁰*Omnia* siquidem, ut ait sapiens, *in mensura, numero et pondere consistunt*.

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7. aequis *in marg* H
8. haec *om* A
 praefactas A
 in chorda *in marg* H
9. (iustissime) *pa dele* H

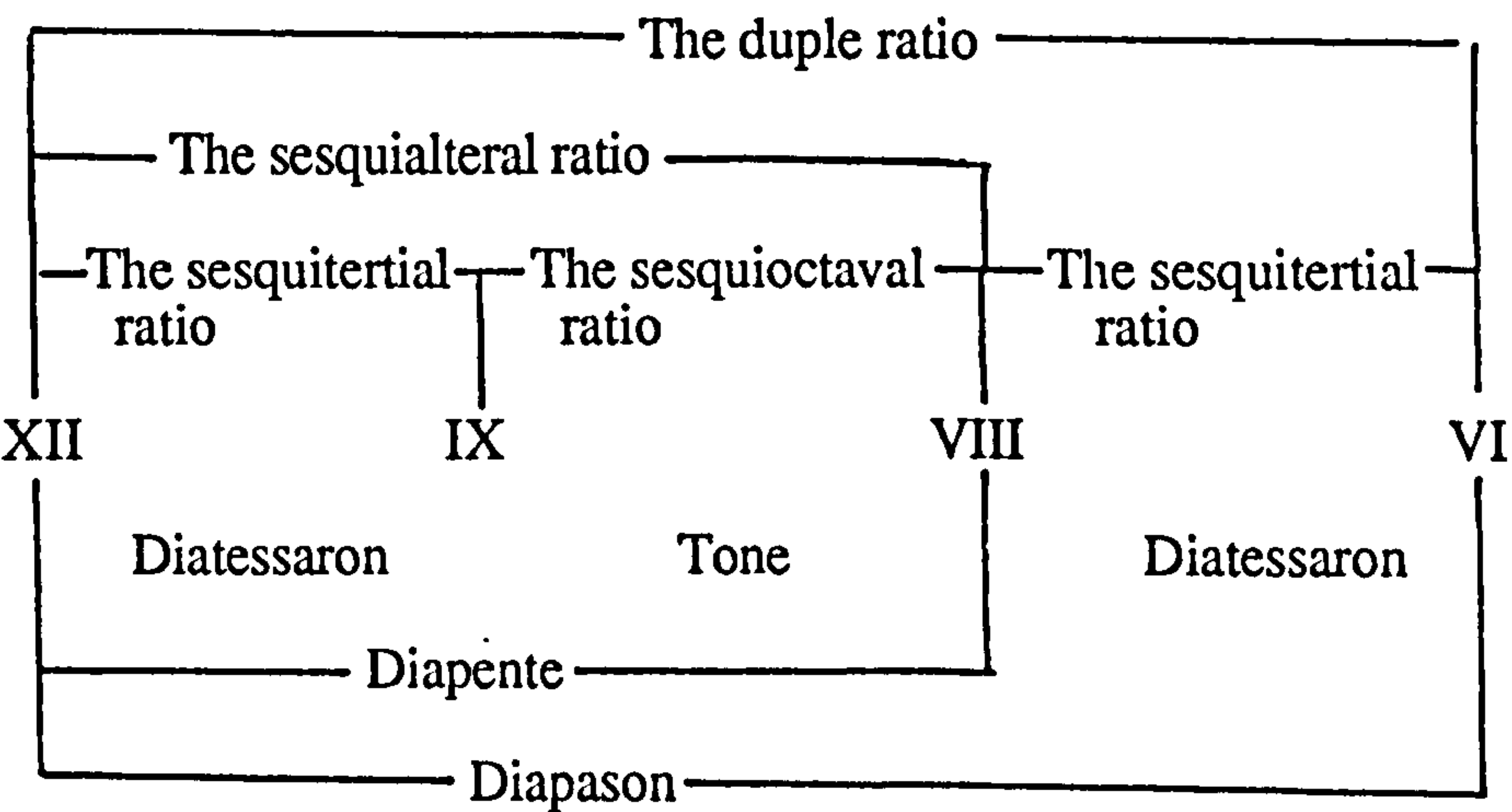
⁷This diagram shows the tone, the diatessaron, the diapente, and the diapason. All of these, with their true, equal and perfect parts, certainly measure out the total length of the string on the monochord. There are no other combinations of sounds, *phthongi* or pitches which can in fact presume to claim such status. ⁸I intend to examine after this the nature of the monochord, as I wish to demonstrate to the naked eye that the tone and the diatessaron, together with the other perfect consonances, cannot be produced and sounded on the string without using the numerical ratios mentioned above—2:1, 3:2, 4:3 and 9:8. I am disposed to wish to examine the fact that the principal parts of the tone are the major and minor semitones, and that in no way can the tone be divided into two equal parts. ⁹There is no other instrument which proves the truth in such a way as this one, as far as musicians are concerned: and this is because the unbroken whole is there divided variously and absolutely correctly according to the ratios mentioned above. ¹⁰All these principles—so the wise man tells us—are dependent on measurement, on number, and on weight.⁴⁹

⁴⁹Cf. *Sap.* 11, 21: sed omnia in mensura et numero et pondere disposuisti.*

¹¹Hic Jubal prior cecinit ac primus artem reperit, omne sumens iudicium, ut hic patet in numeris; quam demum in marmoribus sculpsit ac in lateribus ne pereat diluvio vel solvatur incendio.



¹¹This Jubal was the first to sing, and indeed the first to discover the art by undertaking every investigation, as is demonstrated here in the numerals. He eventually sculptured this in marble and in brick lest it perish in a flood or be destroyed by fire.



¹Capitulum duodecimum: ²Numeros eiusdem esse naturae voces et sonos.

³Nemini quidem grave videri debet, si numeros eiusdem esse naturae dicam et sonos, cum etsi lingua sileat aut scribere cesset calamus, non aliud ipsa natura clamet. ⁴Nam oro, quid est numerare nisi de decem unitatibus crescendo quasdam summas varias aut decrescendo congregare, totumque si sit opus, in primam unitatem et omnium matrem resolvere. ⁵Decem etenim varii tantummodo numeri sunt, et quicquid ultra numeretur non est novum, sed unum et idem totiens quotiens volueris replicatum. ⁶Quidve, quaeso, canere nisi de solis sex sonis tam varias quas supra vidisti vocum resonantias concreare, seu idem resumendo semper nunc voces intendere, nunc versus suam originem reflectere? ⁷Sex namque dumtaxat varii soni tres diatessaron species exprimunt, ut supra visum est, nihilque novum ultra canitur, sed replicatum est. ⁸Nullam ergo prorsus inter sonos ac numeros distantiam video, nisi quod vox sit continua dinumeratio, cantus autem vox cum intervallo suspensa. ⁹Quid plura? Motus est ab unitate numerus in unitatem, et motus est a sono in sono cantus identidem. ¹⁰Quemadmodum enim ab unitate movetur in aliam unitatem binarius, sic et tonus ab uno sono transit in alium ac semitonium minus.

1. A 8r H 10r
 3. clamat A
 5. voces nunc A
 7. ultra *in marg* H

¹Chapter XII: ²That pitches and sounds have the same natural ratios as numbers.

³No-one should be seriously concerned because of my claim that numbers and pitches share natural properties: even if my tongue were silenced and my pen ceased to write, nature herself would make the same claim. ⁴For, pray, what is counting, if not the production of different amounts by addition or subtraction—out of the ten basic units—and, if one's efforts are to be complete, to resolve them back to the initial unity, the mother of all?⁵⁰ ⁵There are only ten different numbers, and any reckoning beyond these is not new, but one and the same thing repeated as often as you wish. ⁶What is singing, I ask, other than to create all the different vocal sounds which you saw above, out of just six sounds, or, using them over and over again, raising the pitch of the voice, and at other times reverting to the original pitch? ⁷For there are but six distinguishable sounds which produce the three types of diatessaron, as I previously made clear: nothing new is ever sung beyond these, but is a mere repetition. ⁸I am aware of no great difference between sound and number, unless perhaps we can say that spoken sound possesses the quality of continuous delivery, and that a melodic line is made up of such a sound divided up by intervals.⁵¹ ⁹What need of more? Number moves from one whole to another, and melody likewise moves from one sound to another. ¹⁰In the same way as a two-fold number progresses from one unit to another, likewise there exists a tone or minor semitone between one sound and another.

⁵⁰Cf. *De inst. arith.* 1,14 (30, 26-28): Dicitur autem primus et compositus, quod nullus eum alter numerus metiatur praeter solam, quae cunctis mater est, unitatem.

⁵¹See above, n. 34.

¹¹Et sicut ex tribus motibus unitatis in unitatem surgit ternarius, et ex quatuor quaternarius, sicque de reliquis, ita quidem ex tribus sonorum motibus constat ditonus ac semiditonus, et ex quatuor oritur diatessaron et tritonus caeterique musici motus iuxta suam uniuscuiusque propriam qualitatem et quantitatem.

¹²Concrescunt numeri, conscendunt et soni. ¹³Decrescunt numeri, descendunt et soni. ¹⁴Infiniti sunt numeri, infiniti sunt et soni. ¹⁵Prodeunt ab unitate numeri, prodeunt ab unisono soni. ¹⁶Reducuntur ad unitatem omnes numeri, resolvuntur in unisonum omnes soni. ¹⁷Numerat homo quantum habet ad numerandum; canit homo quantum ab imo scandit in altum. ¹⁸Ergo cantor non dicas "quid habent numeri cum cantibus?," quoniam adeo soni subiecti probantur esse numeris ut nullum omnino verum de motibus musicis proferri valeat iudicium, si non fuerit per descriptas ibi proportiones tam in multiplici quam superparticulari diligenter discussum. ¹⁹Nam ut vides in ipsa figura, quatuor motus musicos integros simplices ac primos quatuor illis proportionibus subscriptos, ac sicut sesquitertia cum sesquioctava producit sesquialteram, et ipsa sesquialtera cum sesquitertia, vel e converso duplam proportionem, ita diatessaron cum tono diapente perfectum, ac idem diapente cum diatessaron aut e converso diapason perfectam, non aliter progredi potes eosdem componendo motus usque in infinitum. ²⁰Si namque duplam cum sesquialtera componas, ut hic: II–III–VI, triplam componis, in qua diapason diapente perfecta resonet, sed non simplex consonantia.

11. (numeri) a *dele* H
 consendunt A
 uniuscuiusque *scripsi* unusquisque HA

18. soni *om* A
 iuditium A

19. (aut) e (converso) *om* A

¹¹The number three arises out of three progressions from unity to unity; the number four from four progressions. Thus it is with the rest of the numbers. Likewise, the ditone and the semiditone are established by the progression of three pitches. From the four-fold progression arise the diatessaron and the tritone. Other musical progressions come into being, each according to its own characteristics and its range. ¹²Numbers become greater, sounds become higher. ¹³Numbers decrease, sounds become lower. ¹⁴Numbers are infinite, sounds are also infinite. ¹⁵Numbers are born of the single unity, sounds are born of the one initial sound. ¹⁶All numbers finally resolve back to this initial unity, all sounds back to the one sound. ¹⁷The range of man's counting depends on how much he needs to count; man's singing range depends upon how high he reaches, starting with the lowest pitch. ¹⁸Therefore, dear singer, you are not to say "What do numbers have in common with melodies?", since sounds are proved to be so subservient to numbers that no value judgement can be brought to bear on musical progressions unless there has been a careful analysis according to the numerical ratios I have described above—both of the multiple and superparticular species. ¹⁹For as you see in the diagram, the four prime, simple, complete musical progressions are written under the four ratios. The 4:3 ratio added to the 9:8 ratio produces the 3:2 ratio. The latter, added to the 4:3 ratio—or vice-versa—produces the 2:1 ratio.⁵² Likewise the diatessaron with a whole tone added to it produces a perfect diapente, and the same diapente with the diatessaron - or vice versa - produces a perfect diapason. In just the same way, you can progress by compounding the same movements to infinity. ²⁰If you couple the 2:1 ratio with the 3:2 ratio in this manner, 2:4:6, you then produce the ratio 3:1 as a result of which a perfect diapason and diapente is sounded. This is not however a simple consonance.

⁵²Concerning addition of consonances to create others, cf. *De inst. mus.* 2,26 (258, 19-27).

²¹Si vero triplam et sesquiterciam copules, non dubium quin extremi numeri surgant in quadruplam ut hic: I–III–III proportionem, quae sicuti dupla simplicem diapason, ita compositam bisdiapason consonantiam generat.

²²Quid ultra dicam? ²³Nulla fit utique de sonis ac vocibus concordia sive discordia canendo quae non cadat etiam in his proportionibus simul aggregatis numerando.

²⁴Quod ut lector facilius capere valeat ubicumque tractandum est de numeris, hoc expleto primo libro, secundum a quinque generibus inaequalitatis inchoare disponimus, ubi tota natura numerorum ac inaequalium proportionum habetur.

²⁵EXPLICIT LIBER PRIMUS.

21. ut hic 1 111 1111 *in marg* H (ut hic) apparet *add et dele* A
 quae *om* A
 24. letor A
 in aequalitatis A
 proportionem *pro* proportionum A

²¹If you couple together the 3:1 and 4:3 ratios, clearly the outside numbers produce the 4:1 ratio in this manner, 1:3:4. This produces the compound consonance in the same way as the 2:1 ratio produces the simple diapason.

²²What more need I say? ²³Assuredly, no consonance or dissonance exists in singing which does not also fall within these ratios compounded by the arithmetical process.

²⁴So that the reader may grasp with greater ease the subject matter whenever we must deal with number, now that the first book is complete, I am disposed to begin the second with the five types of inequality, when I will consider the whole nature of numbers and unequal ratios.

²⁵HERE ENDS THE FIRST BOOK.