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Title: Treatise on the Genera and on the Modes of Music, second book

Source: Bologna, Museo internazionale e Biblioteca della Musica, MS D.143, <224>-<496>

[<224>-] On the Modes, second Book

On the seven Species of the Diapason.

It is something recognised by everyone that some difference between the Modes derives from the species of the Diapason, albeit the modality of this was not agreed universally, as well as the issue of whether something else is required to differentiate one from the other. It is necessary to explain what these species are before anything else. Therefore, Ptolemy says <Ptolomei verba desunt>

[[then he adds that these differences in the Diapente and in the Diapason are found through the Disjunction,

but in the Diatessaron

Therefore, it is certain that a System will have as many intervals as species.]]  
Therefore, every System will be distinguished according to the different position of the interval which is found in it only once, and, because such interval can change position as many times as the intervals are, it follows that the System of four notes, namely, the Diatessaron, cannot have but three species, because [<225>-] it is composed of just three intervals. The System of five notes, or Diapente, has four and the Diapason seven, but the divisions of the species of the octave derive from the combinations of the species of the fourth and of the fifth, which, since they regulate the melodies and the first division of the Diapason, the differences are derived from these and not from other smaller intervals, rather than from the fact that the ancients did not know any other smaller consonance, as Salina says in the first chapter of the fourth book. Because the intervals also vary according to the different genera, since each genus has a particular one which is the third one going upwards, as the Tone in the Diatonic, the Trihemitone in the Chromatic and the Ditone in the Enharmonic, one should derive the difference between the fourths from this, but, for greater ease, and because there is also another tone in the diatonic fourth, the habit of considering the position of the Semitone in the diatonic fourth has prevailed, albeit Ptolemy adopts the third interval in every genus. However, everything turns out the same because the Greeks begin from the top, while the Latin writers from the lower end, therefore the first species of those is also the first species of these, and so are the other ones. Therefore, the first species of the Diatonic fourth is the one which has the Semitone in the first place towards the low register, the second the one that has it in the second one and the third one in the third place. However, in the case of the Diapente as well as in the Diapason, since they have the tone of the Disjunction, it is more convenient to base the different of the species on it, albeit one should note already that it is not true, as Salinas says, that there is a discrepancy [<226>-] between Ptolemy and Cleonides

(whom he called Euclides) in counting the species, because both of them and all the Greeks maintain the same order ascending from the low register to the high one in counting the species of the Diatessaron and of the Diapente, either considering the high interval of each of them which is the tone or the low one, or Semitone (which one must bear in mind to avoid the misunderstandings that cloud the minds of many). The Greeks begin the first species from the Hypate hypaton [sqb] mi to the Paramese [sqb] and then the second one from the Parhypate Hypaton [ [C sol fa ut add. supra lin.] to the C sol fa ut, and thus the others in sequence, assigning the first species (the lowest) to the highest Tone, the second one to the following one, and so on, if we consider the disposition from the low to the high register, but, if we consider the order of the Tones, we should progress from the high to the low register. This has to be considered well because it is not something which is understood so well, and it has made many make some strange statements since they believed that there are contrasting opinion among the Greeks themselves, while Boethius counted as first species of the octave the one which occurs between Proslambanomenos A re and the mese a la mi re, as the second one <aliqua desunt>

This distribution was followed by modern writers up to Zarlino, who - considering that the new Scale or System called Gamma because it starts from [gamma] rather than from A re - wanted the order of the seven species to start from [-<227>-] that or from C fa ut, which is the same according to modern modes, since there is everywhere the same deduction, namely, Ut re mi fa. Consequently, since Boethius had to alter the sequence of the fourth and of the fifths, if he wanted them to correspond to his species of octave which is formed by them, equally, Zarlino was bound to alter the sequence of the species in his fourths and fifths. From this there followed that what was the first species of the fourth according to the Greeks, it became the second according to the followers of Boethius and the third one according to more modern theorists or followers of Zarlino, and thus all the others are disrupted in the same way, as well as the fifth which depend on those and those of the octaves which are based on both. Hence, one can see manifestly that everything is disrupted in time and that music, begets always some new monster, such as Africa does. One will be able to ascertain from what follows whether the followers of Boethius improved much their profession or rather added to its disruption by moving away from the Greeks, and whether modern writers have done so by moving away from the Greeks and from the followers of Boethius. One can see from the example that I placed here what correspondence have with each other these different ways of counting the consonances.

[-<228>-] Second chapter

[Doni, Treatise of the Genera and of the Modes, second book, 228, 1; text: secondo i Greci, Boetiani, ut, re, mi, fa, sol, la, a, G, F, E, D, C, [sqb], A, [gamma], prima specie, seconda, terza]

[[Doni, Treatise of the Genera and of the Modes, second book, 228, 2; text: ordine de Greci, Boetiani, ut, re, mi, fa, sol, la, a, G, F, E, D, C, [sqb], A, [gamma], prima specie, seconda, terza, aa, g, f, e, d, c]]

One must consider a number of matters. Firstly, in our present System of nine notes (which we have placed here because it contained the first Diapason of the ancient

System with the note added by Guidone from which modern theorists start their deductions) the Greeks could not start the first species from [sqb] mi but from e la mi, if they wanted that the other should follow in order, namely, that [-<229>-] the first one should have the Semitone in the first place from the bottom, the second in the second and the third in the third. Conversely, modern theorists can start their first species, which says ut re mi fa, both on Gamma ut on C fa ut. Secondly, the Greeks would not have elected to start from [sqb] mi in particular, had they followed the practice to place the [gamma], called by some Hypoproslambanomenos for this reason, ut under A re or Proslambanomenos, because they could count the species from these three notes. However, modern theorists start more readily from C fa ut than from gamma ut and the followers of Boethius from D sol re than from A re, because they distinguish Authentic and plagal modes, and consider those the most noble and first. We shall see later what this means. However, the ancient Greeks did not consider this difference. Thirdly, the fact that Cleonides begins (in the two genera, Enharmonic and Chromatic) the first species from [sqb] to E and follows it with the one from C to F, rather than from E to a, as Ptolemy does, suggests to Salinas that he followed a different sequence. This is not true, because a little further on he says that the first Species in the Diatonic has the semitone in the first place, the second in the second and the third in the third, therefore it does correspond to Ptolemy's sequence and to the one of the other Greeks. However, we shall see later why this difference occurs in the two other genera. Fourthly, this distribution is much clearer and easier than the others, as Salinas also confirms following the natural sequence of the disposition of the Tetrachords which have the Semitone in the first place in all genera (albeit there is no uncompounded Semitone in the Enharmonic). Therefore, [-<230>-] since it would not be attractive not to place in the sequence of the tetrachords the one that follows their natural disposition within the System, thus, they placed the species that has the Semitone in its lowest part as the first species with good reason. This proved practical as well for them as such species suits the Dorian, which is the most highly regarded of the modes and the one in the middle of them all, as well as the Mixolydian and Hypodorian, which are the first and last of the seven ones and they are almost subordinate and plagal in relation to the Dorian, as we shall see later. Fifthly, one must note that only the first of the three species of fourth occurs between stable notes, since it has the same first and last note as those of the Tetrachords which occur naturally in the System, while the other two occur between the mobile notes, which are the two middle ones, as one can see in these tetrachords [sqb] c d E. .E F G a. where the stable ones are [sqb]. E a. and the other four are mobile. We can consider the different way of numbering the species of the fifth adopted by the Greeks, by Boethius' followers and by the more modern theorists in a similar way, because the first of the Greeks is the second of Boethius' followers and the third of the modern theorists, the second of the Greeks is the third of the Boethius' followers and the fourth of modern writers, the third of the Greeks is the fourth of Boethius' followers and the second of modern theorists, the fourth of the Greeks is the first of Boethius' followers and the second of modern writers and the fifth of the Greeks is the first of Boethius' followers and the            of modern theorists. Nevertheless, the Greeks have considered the different position of the tone in differentiating them, namely of the third one which is found in all genera, and this produces a much better result because the same disposition works for all the genera, while the others have considered the position of the Semitone.

[-<231>-] [Doni, Treatise on the Genera and on the Modes, second book, 231; text:

[gamma] A re, [sqb] mi, C fa, D sol re, E la mi, F fa ut, G sol re, a la mi, [sqb] fa, c ordine de Boetiani, di Iacopo fabro secondo i, del Zarlino moderni, prima specie, seconda, terza, quarta, noi, nostro]

[-<232>-] However, one must note here that Boethius placed the first species from a to E, the second from [sqb] to F, the third one from C to G and the fourth one from D to a, while in the second one there is not a true fifth but a Semidiapente, since it has a Seemitone instead of a tone, since he considered not so much the consonance of the note, but their order. He was not followed in this, and quite reasonably so, since in this way he establishes only three species and instead of the fourth one he places a false fifth, which it is something that he must have been very aware of, but that he disregarded. Not also that we have placed the disposition of the diapente according to the Greeks following the way in which Ptolemy and Cleonides are interpreted commonly. However, since one cannot gather from Ptolemy's words if he understood as first species the one which has the tone of the disjunction in the first place from the bottom and the fourth in the first place above, or the other way round, since he does not name the notes, but says only that the first and the fourth species are contained by stable notes and the other two among the mobile ones (which occurs in one way and in the other) and also because Cleonides departs from this somewhat (if there text is correct) by placing the tone in the first species the tone in the high one but in the second place upwards in the second, we still consider much better to place the tone in the first place from the bottom in the first species, in the second place from the bottom in the second going upwards, in the third place in the third species and in the fourth one in the fourth species. These are the reasons, namely, because it is convenient to distinguish the fourths according to the position of the Semitone and the fifths from the position of the tone of the disjunction, but much more because the three principal modes, Dorian, Phrygian and Lydian, are distinguished according to the three species of fourths, as we shall see, and the four which are less principal from the four species of fifth, apart from the fact that Boethius himself followed the middle disposition for the most part, [-<233>-] nor, in my opinion, it is possible to find a disposition which is more attractive than this one, or one which is easier to remember. As to Fabro's disposition, it is not worth discussing, because it is not very rational as it does not follow the order of the Semitone or of the Tone and it does not place its fifths among the notes, the first and the second at the distance of a semiditone and the second and the third at the distance of a ditone. For this reason it has not been followed by anyone, as far as I know. Moreover, albeit he was a follower of Boethius, he has deviated more than any other from his order and sequence because of the difficulty, I believe, that he met in the second species of the fifth that occurred between [sqb] and F, which is a false fifth.

[-<234>-][Doni, Treatise on the Genera and on the Modes, second book, 234; text: 7 Spezie della Diapason ordine del Zarlino [[moderni]], de Greci, di Boetio, Boetiani, [gamma], A, [sbq], C, D, E, F, G, a, c, d, e, f, g, aa, [sbq][sbq], ut, re, mi, fa, sol, la, [alpha], [beta], [delta], [epsilon], [zeta], [eta], 1, 2, 3, 4, 5, 6, prima, seconda, terza, quarta, quinta, sesta, settima]

[-<235>-] [[This table illustrates that the first species of the octave is formed of the first of the fourth and of the fourth, the second of the third of the fourth and the

second of the fifth, the third from the second from the fourth and the third of the fifth.]]

Perhaps one will be better able to learn how the species of the Diapason are composed of the Diatessaron and of the Diapente from the table drawn below, where we have placed each species in two ways, as it occurs within the octave, as well as these signs S and T, which indicate tones and semitones.

[Doni, Treatise on the Genera and on the Modes, second book, 235-236; text: Specie della Diatessaron, S, T, prima secondo i Greci, seconda de Boetiani, terza de moderni, del fabro, 1, 2, 3, 4]

[-<237>-] [Doni, Treatise on the Genera and on the Modes, second book, 237; text: 7 Specie della Diapason secondo i Boetiani]

[-<238>-] On the Species of the Diatessaron and of the Diapason in the Chromatic and in the Enharmonic.

In order to understand correctly how the species of the first consonances occur in the two genera Chromatic and Enharmonic, we must remember what is Thick or Dense in the tetrachords, because it is clear that the three sorts of Diatessaron are distinguished by its varying position, as the three sorts of Diatessaron and of the Diapente are distinguished in the Diatonic by the simple Semitone and from its different position.

Denso o piu comunemente dal Sito del tuono (che in questi due generi [[si t]] non se ne troua più di uno nelle quinte) come [[ci inseg]] si caua manifestamente da

Equally, one must know that the first and lowest notes of each Tetrachord are called Barypycne, which means low and dense or low and thick from the word [barys], which means low and [pyknos], which means dense. They are called in this way because towards the Dense extremity, because the Dense is placed in the lowest part of each tetrachord. Therefore all the two Hypate shall be Barypycne, as well as the paramese and the Nete Diezeugmenon, since each is the first note from the bottom of the four Tetrachords of the Disjunct System. [-<239>-] Moreover, the second note of each tetrachord is Mesopycne, because mesos means middle and they are called thus because they divided the Dense and separate the first and lower interval from the second and higher one. These are the two Parhypate of the two lowest tetrachords and the two Tritone of the two high ones, which correspond to those. Oxypycne, or high and thick because [oxys] means high, are called the ones which contain the dense towards the high part of the tetrachord and separate it from the second interval, which is the Trihemitone in the Chromatic and the Ditone in the Enharmonic. These are the two lychani of the lowest tetrachords and the two Paranete of the higher ones which correspond to them. Also, since the barypycne are the extreme notes of the Tetrachords, they are all stable, while the Mesopycne and oxypycne are all mobile, because they change according to the genera, as it was said above and the illustration shows. Besides these, there are the Apycne, or not dense or far-removed from the Dense, because a is a particle which indicates deprivation. The ones that mark the low boundary of the two separate tones of the Tetrachords, namely the

Proslambanomenos, the Nete and the last of all or nete Hyperboleon, are called thus. It is very true that the Mese is not Apycna all the time because it is not Apycna any more when one uses the tetrachord of the conjunct notes or when one sings with the b flat, but it becomes Barypycna because, in that case [-<240>-] it is the first and lowest of said Conjunct Tetrachord, the second of which, namely, the Trita, is Mesopycna, as the other Trita, and, equally, the Paranete is oxypycna, as the paranete of the other tetrachords. However, the Mese of this Tetrachord is Apycna, because, since this conjunct Tetrachord is divided in the Tone of the Disjunction, said tone occurs a tone higher and it divides the Synemmenon and the Hyperboleon, hence the nete Hyperboleon cannot be Barypycna any longer, because it has not the Dense above itself but said Tone. Therefore, it becomes Apycna instead of the Mese, since all that is adjacent to said Tetrachord, on the contrary turns out to be Barypycna, as we said. Therefore, the Apycne are three, namely, the Proslambanomenon, the Nete Synemmenon and the Nete Hyperboleon, while the Barypycne are four in number, namely, the Hypate Hypaton, the Hypate Meson, the Paramese and the Nete Hyperboleon. The Mesopycne are five, namely, the two Parhypate of the hypaton Tetrachord and of the meson, the three Trita, Synemmenon, Diezeugmenon and Hyperboleon. The oxypycne are also five, namely, the two Lichanos, Hypaton and Meson, and the three Paranete, Synemmenon, Diezeugmenon and Hyperboleon. Finally there is a variable one, since it can be either Apycna or Barypycna, which is the Mese, although, as I said above, only a note (which is the trita b ga) of the Synemmenon Tetrachord has a different sound from the other ones, at least in the participated System. If we take all this as our basis, the first Species of the Diatessaron in these two genera is Barypycna or among the Barypycne, the second one is among the the Mesopycne and the third one among the mesopycne, so that, the three [-<241>-] Diatonic Species correspond exactly to these and they occur among notes of the same name, and the, moreover, the Barypycna species corresponds also in its extreme intervals, as we can see here.

[Doni, Treatise on the Genera and on the Modes, second book, 241; text: Prima Specie della Diatessaron, Diatonica, Cromatica, Enarmonica, Tuono, Semituono, diesi, ditono Trihemiuono, A, E, F. [sqb], Barypycna, Hypate Meson, Mese, lichanos hypaton, Parhypate, Hypate, Diatonica, Seconda, D, F, G, C, Mesopycna, Proslambanomenon]

[-<242>-] [Doni, Treatise on the Genera and on the Modes, second book, 242; text: Terza Specie della Diatessaron, Diatonica, Cromatica, Enarmonica, oxypycna, Tuono Semituono, Trihemituono, Ditono, diesi, lichanos meson, Parhypate Hypaton, Hypate, Mese, Diatoniche, Mese]

[-<243>-] Explanation of these illustrations, Chapter

Since it is possible that who reads these illustrations might find something not so easy to understand at first sight, it will be appropriate that we move on and illustrate them. First of all we shall explain why the chromatic and Enharmonic notes of the Tetrachord correspond to the Diatonic in the first species, but not in the others. To explain this, we must remember that in every Diapason, which is a perfect System, there are no more than two intervals which belong to the Chromatic (leaving aside the

compounded Tetrachord for now) and also two Enharmonic notes, which are the two lichani, in the lower tetrachord where we place our examples, as the Paramese above, because the Parypate correspond in sound and name to the Diatonic ones. These two intervals are the second semitone of each tetrachord, and they have as their lower note C and F, according to modern practice, and, as to their higher note, we do not change the letter, but we distinguish them with these special signs # #, which denote them and, albeit they do not change the note, we must imagine that they are higher (since they are called raised) just as their interval is enlarged by a Semitone. Equally, in the Enharmonic, one does not add anything than a note for each tetrachord, which divides the first interval of the tetrachord, just as the Chromatic divides the second one, namely, the first tone. However, since this does not correspond in its place or in its tone to any chromatic note, since it is a specifically Enharmonic one, it is called simply Enharmonic Parhypate and it should have its own figure as the chromatic lichanos does, as it had in ancient times. However, we accommodate [-<244>-] this by using the very same notes of the Hypate which are common and mobile simply by adding this sign [signum] or this one [signum] (which seems to us easier because it expresses better the three common ones of the five which the larger Semitone then contains) and by imagining also that such note is an Enharmonic diesis higher, just as the sound that it represents. Now, therefore, since the first species follows the natural order of the Tetrachords and it is contained among the stable notes, the two extreme ones are necessarily the same in each genus. This however does not happen in the other two species, because, since they have as their extremes some mobile notes, which are different as to their sound and their tone when genera vary, therefore, it follows that they cannot have the same extreme notes, and that the diatonic fourth in the second species starts on D la sol re or a la mi re up to G sol re ut or D la sol re, according to the selected tetrachord, while in the Chromatic it starts from C sol fa ut or F fa ut up to F fa ut and b fa, according to the conjunct tetrachord. However, in the Enharmonic the same species of fourth starts on E la mi or [sqb] mi with the enharmonic diesis and goes up to E la mi with the diesis and also to A la mi re with the same diesis, were it to proceed through b flat or by conjunct tetrachord. The same would occur if one wanted to play the Chromatic and the Diatonic on an instrument, for instance a Harp with the span of two or three octaves and with all the necessary notes of all the genera. In fact, in the species contained within stable notes his melodies in all the genera according to their extreme notes would be successful, but in the species based on mobile notes this would not occur, therefore, if one played within the species of E la mi [sqb] mi or a la mi re [-<245>-] one would start and finish one's melodies in one of these notes, but if one wanted to play in the species of D la sol re or G sol re, which contains the third species of fourth, he would not start nor stay in unison when one moves from a genus to the other, as one can see from the illustration. One must pay close attention to it, because without it is not possible to understand how the Seven modes are organised according to the last two genera. We must also note that the highest and the lowest note of the tetrachords in the third species are marked, according to our practice, in the same notes, except for the fact there is the added accidental sign in the chromatic, which demonstrates that they are in unison in the Diatonic and in the Enharmonic, but not in the Chromatic. This derives from the fact that the Enharmonic lichani are in unison with the Diatonic and Chromatic Parhypate, but the Chromatic lichani are particular to it and have a different sound. [[This disruption did not occur in the ancient tablatures]] One must also be aware that our way of writing music was very different from the ancient one, which was more logical and easy, because, whereas we, for instance, would mark the

eight notes of an Enharmonic octave in this way: E E# F A [sqb] [sqb]# C e, because we place in the same note and Diatonic line the Enharmonic and Chromatic particular voice adding this sign [signum], hence there follows this draw-back, namely that one cannot see the eight letters and that the Ditone and Semiditone do not appear otherwise uncompounded, since they are in a simple genus, the ancients followed another method, ascribing certain signs only to the particular chromatic and Diatonic notes, as for instance [sqb] C [signum] D E F G [signum] A [sqb] where the dot is added only to the two which are specifically Enharmonic. Therefore, it follows that an octave has all its eight letters, as it has the same eight names of the notes in all the genera, with the addition of the adjective Chromatic or Enharmonic to the particular notes, namely Hypate, Parhypate, Lichanos, Hypate Lichanos Hypaton Paripate Lichanos Meson Paramese. This distribution was really more [-<246>-] well-structured and adapted to their use in the three genera than our own. It follows from here that where we change the note beneath when we change genus, we would have to do the same with the one above. I will explain this more clearly because, starting from the first note of the perfect System A re, I move on to the second one which is itself common to all the genera and stable as well as the interval that it produces. If then I move on to the next Diatonic note, I proceed to the C which is mobile and it is a Semitone removed from B. However, if I want to ascend Enharmonically rather than Diatonically, it is necessary that I should choose the Enharmonic Parhypate, which produces such interval and which it should have been marked with a C with the added sign that I shall use to indicate the Enharmonic, rather than with a B, which is a stable note, and, consequently, it has always the same Sound and it should not be raised as a figure. I say that this is only brought about by the fact that nowadays there is no distinction between stable and mobile notes, which is something that creates a great deal of confusion and difficulty in understanding the theory and in applying it in practice in these genera. [[For this reason we have wanted to produce here the illustration of the perfect system with all the notes and the names and with the difference between the stable and mobile notes, and those which complete and do not complete the]]

[-<248>-] One must also be aware that, in the second and third species of Diatessaron of the Diatonic, the first notes of the Tetrachord have a different name, because in the first one there is only one lichanos, while in the place of the second one there is the Proslambanomenos or the Mese, because the deduction of a Tone, Semitone and Tone, or Re mi fa sol begins only from those two notes, while from the Lichanos Meson one finds the deduction of three tones, namely, fa, sol, re, mi, which occurs because of the Tone of the Disjunction which occurs towards the high register. In the second example one places the Parhypate Hypaton and the Lichanos Meson instead of the Parhypate Meson, because the deduction of three tones fa sol re mi, which is not a species of diatessaron, but a Tritone begins from the Parhypate Meson. Hence one notices the difference between the lay-out of the species of the Diatessaron in the Diatonic from the one which occurs in the two other genera. For this reason the ancients, who were marvellous and incredibly diligent in these matters, considered very rightly that one could not produce a mutation in the thick genera and in the non thick one through the same interval of a Semitone, albeit it is found everywhere accompanied by another one in the Chromatic and divided in the Enharmonic

[-<249>-] Demonstration that there can be no more than three species of Diatessaron

and four of Diapente, Chapter

Therefore, considering with great care the different Position of the Thick in the Chromatic and the Enarmonic, which, if we think carefully, we shall find that it cannot produce other structures or varieties, since, either it is found all together towards the low register, as in the Barypycna, or towards the high register as in the Oxypycna, or half towards the high register and half towards the low one, when the large interval occurs in the middle, as in the Mesopycna, but it cannot occur in the middle, should we not divide the large interval and if we made it compounded from uncompounded by adding another note. However, in that case the Tetrachord would not be simple and it would require five notes. Since I said earlier that the Species of the Diapente in the last two genera progressed in the same way and that they could not be more than four, it will be best to explain this more clearly. Therefore, we must be aware that, just as one can see that in any of its dispositions the large interval is placed always above the thick, consequently, the Tone of the Division (which makes up the Diapente with the other three intervals) will always be the large interval and below the Thick, as, for instance, in the Barypycne:

[Doni, Treatise on the Genera and on the Modes, second book, 249; text: E, F, A, [sqb], Denso, Interuallo grande, ditono, Tuono].

Cleonides places the first species of fifth [-<250>-] in the Mesopycna, which is the second Species in his writings,

[Doni, Treatise on the Genera and on the Modes, second book, 250, 1; text: diesi, Ditono, Tuono, medesimo, E [signum] F A [sqb]]

in the oxypycna, which is the third Species:

[Doni, Treatise on the Genera and on the Modes, second book, 250, 2; text: [[Ditono, E, F]] Ditono, Tuono, Denso, F, A, [sqb], [sqb] [signum], C],

and again in the Barypycne with the tone in the first place, which is the fourth species

[Doni, Treatise on the Genera and on the Modes, second book, 250, 3; text: Tuono, Denso, Ditono, A, diesi, [sqb] [signum], E]

One must note that where the tone is not actually above the large interval, as in this last species, it is so at least virtually, because if one continues the Series of the notes towards the low register, one will have to place the Ditone beneath and the note F beneath the A. The same follows respectively in the Chromatic, by changing the Ditone into a Semiditone and the Semitone divided into dieses into a Tone divided into Semitones. Hence one can see that the four species are determined by the varied positions of the tone of the division, which it is in the first place towards the high register in the first species, in the second place in the second species, in the third in the third species and in the fourth in the fourth one. This fourth species could also have been called Apycna because it starts from a note which is Apycna. Here we are not obliged, but it appears the right thing to do to follow the ancients who considered

that in this fourth species one returns to the first species of Diatessaron which starts from the Pycne, and therefore they called the Diapente as well Barypycnon.

[<251>-] As to the fact that this disposition to place a Thick and a large interval alternatively and a Tone of the disjunction (which has the large interval beneath itself and the thick one above) between every two fourths must be always observed, this is confirmed not only from these species, which nobody has enlarged in number, but from the entire lay-out of the perfect System and from the Aristoxenus very words, who discusses this at length in the third book of his Elements, where he often states that [pyknon pros pykno ou melodeitai oute holon oute meros autou], which means that “the Dense is not sung after the Dense, either whole or in part,” that [touton d'outos ekhonto anagkaion enallax tote pyknon cai to ditonon keisthai.], which means that “the matter laying in this way, it is inevitable that the Dense and the Ditone should be placed alternatively,” that [duo de ditona exes ou tithesetai], namely, that “two ditones cannot be placed one after the other”, then that [peri de ton anison nyn lekton; pyknon men oun pros ditonou kai epi to bary kai epi to oxy tithetai. dedeiktai gar ei the synaphe enallax tithemena tauta te diastemata;], a little later that [tonos de pros to ditono epi to oxy monon tithetai], a little further that [Tonos de pros pykno epi to bary monon titheto], a little further [en diatono de, tono eph'ekatera hemitonion ou melodeitai [[duo]] a little further that [duo de tonon e trion hemitonion eph'ekatera melodeitai], a little further that [duo de ditona exes ouketi tithetai.], a little further that [duo de pykna exes ou tithetai], and a little further that [homoios d'hexei kai epi ton khrematon plen [<252>-] to ge meses kai likhanou diastema metalambanetai anti ditonou to ginomenon kath'ekasten chroan kai to tou pyknou megethos; homoios d'hexei kai epi ton diatonon; apo gar tou koinou tonou ton genon mia estai eph'ekatera hodos; epi men to bary epi meses kai likhanou diastema ho, ti an pote tugthane hon kath'ehasten khroan ton diatonon. Epi [[de]] to oxy, epi to parameses kai trites.], which mean: “However, now we must discuss the unequal intervals. Firstly, the Dense is placed near the Ditone towards the low register and towards the high one (namely, above and below it) because it has been proven that these two intervals are placed alternatively in the conjunction;” “The tone is placed only near the high part of the Ditone; the tone is placed only near the low part in the Dense; in the Diatonic one does not sing a Semitone below the tone, and also above it; the Semitone is placed before and after two or three Tones; one cannot place two Ditones one after the other; two Diesis cannot be placed one after the other; the matter is the same in the Chromatic genus, except that between the Mese and the Lichanos one takes, instead of the Ditone, the interval which belongs to each species and division and also the Dense. The same will happen in the Diatonic, because from the common Tone of the genera one will make a progress (namely, interval) towards both ways, namely, downwards towards the interval between the Mese and the Lichanos which is specific of each Diatonic species and upwards towards the interval of the Paramese and the Trite,” and other statements which he adds along the same lines.

[<253>-] However, if we consider three different sorts of intervals which the Diatessaron has in the perfect System of the Syntonic Diatonic, namely, larger Tone, smaller Tone and larger semitone, from the difference exchange of position of those, which can occur in six ways, one could define as many species of Diatessaron. However, because the difference between the two tones is so very small, one would only hear a very small difference, if any, in the melody. For this reason, neither modern composers or ancient composers and theorists did not take it up, if any are

left. Moreover, they adopt the Syntonic of Aristoxenus or the Diatonic Diatonias which have no difference of Tones, and, consequently, it will be fruitless to observe the two species of Ditone, one of which has the larger tone first and then the smaller one, and the other one the opposite. But not only the two species of the Ditone, the two of the semiditone and the three of the two hexachords are not useful in anything and are part of the Diapente or are composed of the Diatessaron, where the species of these two, which govern the melodies, produce the differences of the ones of the Diapente, so, consequently, it is even more redundant to consider the species of the Seventh, which is a dissonant interval.

[<254>-] Explanation of the perfect System according to the three genera with the names of the notes, Chapter

However, before we explain the Seven species of the Diapason (which is one of the most important matters of music and it is most relevant to our aim) it will be appropriate to consider well the order and disposition of the largest and perfect System of the ancients with all its parts and terms, so that what we shall say next will may be understood without any difficulty, since this is why we have placed it here.

Perfect System of the Ancients according to the three Genera

After I considered above what Tetrachords are, the reason behind their sounds as well as their application, especially in the case of the Conjunct which is added on the side, and the names of each note which are the same in all genera, now we shall consider what is left over. We have divided the whole system into 48 Enharmonic Dieses following the practice of the ancients which comports much clarity and usefulness without considering, for now, the larger and smaller Tones. Therefore, it is enough to know that each octave contains six tones twelve semitones and twenty-four dieses, hence the Heroic verse corresponds to it by excellence, which is almost the model and the basis of all of them, which also contains six feet, twelve syllables (since two short are taken as a long one) and twenty-four tempora. Each Diapente [<255>-] comprises three tones and a Semitone, namely, seven Semitones and fourteen dieses, while each Diatessaron contains two Tones and a Semitone, or five semitones, and, consequently, ten dieses. First of all, note the boundaries of the tetrachords marked by us with two lines, and then the notes which represent a particular sound, which have their lines extended outwards, because these are the notes which are considered in the perfect System according to all the genera, and they do not exceed the number of twenty-five in all, if we do not consider the ones in unison in the conjunct tetrachord. Who understands well their disposition and application, understands the whole of Harmonics. One can see from here which ones have the stable notes and which one the mobile ones, which the Apycne, the Mesopycne and the Oxypycne. I have also added two types of Notes, one according to modern practice and the other one according to the practice of the ancients. The latter ones differ in the fact that they allow us to see all the seven letters in every octave of each genus with this difference, namely, that one adds just a dot in the Enharmonic ones, which shows the small difference in sound, while the chromatic ones are altered also in this way.

[Doni, Treatise on the Genera and on the Modes, second book, 255; text: [[Diat]] Sette uoci Diatoniche A, B, C, D, E, F, G, cromatiche, [Delta], enarmoniche [signum]]

The same letters are adopted in the second diapason towards the high register, but written in lower case. The fact that the Chromatic genus has only two [-<256>-] notes different from the others within each octave, and four the Enharmonic derives from the fact that it has, as we said, two notes in common with the Diatonic. These signs would be very useful to intabulate the three genera without confusion, albeit nobody is forced to accept them, nor being our intention in this treatise to show the way which could be adopted to intabulate the music in a much better way than the one used nowadays, not only in the melodic part but also in the rhythmic one. However, with God's help, we could do this another time.

I also marked with semicircles the places of the Tones and the notes which show the species of the modes to avoid repeating them afterwards.

[-<257>-] How many are the species of the Diapente according to the good and ancient authors, Chapter

After having considered the above mentioned System, we must understand now that Ptolemy (book 2, chapter 9) shows that the perfect System is the one that contains all the consonances with their every species, since, in short, perfect is what is complete of all of its parts, and that, albeit the System of the Diapason is perfect in some way (as Salina also maintains) and the ancient concentrated on this for this reason, namely that it contains all the consonances, since the ones which exceed the Diapason are simply repeated, nevertheless, only the Disdiapason System of fifteen notes is the truly perfect one, because it contains not only all of the consonances, but all the species of each one of them. Therefore, he does not class the Diapason Diatessaron System of eleven notes as perfect because it does not contain all of the seven species of the Diapason, [[and not only the four of the Diapente, but only when two conjunct tetrachords are below the tone of the disjunction and the same number above it and in the middle of four Tetrachords]] albeit they did not use the larger System at the time when the three modes Dorian, Phrygian and Lydian were used, and the reason for this will be explained later. However, it must be known that Ptolemy starts from the high register to the low one in counting the seven species, as the other Greeks do, but in the order of the species he goes from the low register to the high one. This must be considered to avoid any misunderstanding. We shall start from the low register for greater clarity, as this is the practice of our day. Therefore, he places the first species between the Hypate Hypaton [-<258>-] Hypaton and Paramese (namely between B and [sqb]) the second specie between the parhypate Hypaton C fa ut and the Trita Diezeugmenon C sol fa ut, the third one between the Lichanos Hypaton D sol re and the Paranete Diezeugmenon d la sol re, the fourth one between the Hypate Meson E la mi and the Nete Diezeugmenon e la mi, the fifth between the parhypate Meson F fa ut and the Trita Hyperboleon f fa ut, the sixth between the Lichanos Meson g sol re ut and the Paranete Hyperboleon g sol re ut, and the seventh and last one between the Mese a la mi re and the Nete Hyperboleon a a la mi re, which is the last note of the System. Now it is necessary that we know why it is really the best System of all. The first reason is so that the first species of the octave would match the first of the Diatessaron and of the Diapason, which both start with the Semitone. The second reason is so that the order of the species would match the one of the seven Tones which had been accepted and organised one with the other in that way much earlier. Thirdly, because, if one started from the high register, it was more convenient to leave out the first note from the bottom (proslambanomenos) than the first from the top (Nete Hyperboleon), apart from the fact that the latter is also more ancient and more

important because it is part of a Tetrachord, while the former has been invented only so that the Mese should have its correspondent at the octave. [[For which reason nobody should have ever abandoned this disposition.]] Therefore, as Girolamo Mei observed acutely, the species proceed in a tidy and organised way in the distribution of Ptolemy and of the other Greeks, who agree with him, and not in the ones by Latin writers, since Boethius started from the low register and did not leave out the note which is the first one in that order from [-<259>-] Proslambanomenos to Mese.

Therefore, one can see that if one wants to follow the order as an uninterrupted sequence, the seventh species must be taken from the Mese to the Nete Hyperboleon, rather than from the Proslambanomenos to the Mese, although in practice this is the same. Therefore, in the first species the Tone of the Disjunction occurs in the first place towards the high register, or in the last one starting from the bottom; in the second in the second place, in the third in the third place, in the fourth in the fourth place, in the fifth in the fifth place, in the sixth in the sixth place and in the seventh in the seventh place. In this way the species are distinguished orderly according to the position of this tone, as Cleonides does. As to the position of the two Semitones, for greater clarity we shall start from the bottom. The first species has the Semitone in the first and in the fourth place [[and it is composed of the first species of the fourth and of the first species of the fifth.]], the second has it in the third and seventh place, the third in the second and sixth, the fourth in the first and fifth, the fifth in the fourth and seventh, the sixth in the third and sixth and the seventh in the second and fifth. The first species is composed of the first of fourth and fifth, or of the Semidiapente and of the Tritone; the second one is composed of the third of the fourth and of the second of the fourth, or of the third of the fifth and of the fourth; the third one is composed of the second of the fourth and of the third of the fifth, or from the fourth of the fifth and of the second of the fourth; the fourth Species is composed of the first of the fourth and of the fourth of the fifth, or of the first of the fifth and of the fourth, while the fifth species is composed of the second of the fourth and of the third of the fourth or of the Tritone and of the Semidiapente, and the sixth species is composed of the third of the fourth and of the fifth or of the third of the fifth and of the second of the fourth; finally, the seventh species is composed of the second of the fourth and of the fourth of the fifth, or of the fourth of the fifth and of the first of the fourth [-<260>-] Here one must note that of those seven species, four can have the fourth under the fifth and the other way round, while the other two can only occur in a way, and instead of the second way they have the semidiapente underneath the tritone, or the other way round. However, in our modern modes it is a different matter, because they distinguish this different position of the fourth and of the fifth and for this reason they become twelve, because the five species, with two different lay-outs, turn out to be ten.

[-<261>-] On the Seven ancient Modes or Tones, chapter

The aforesaid seven species of the Diapason are called Modes, or rather they are the ones that constitute and determine the modes, which are called Tropes [tropoi] in Greek, a term that has the same meaning and it derives from [trepo] which means turned and changed, and denotes different changes and ways to combine the sequence of the small and large intervals in the System used in singing and in the Diatonic, especially in relation to Tones and Semitones. Franchino called them Manieras in Latin, using a non-classical term. These are the ones that have given much to write

and quibble to the ancient musicians and to the modern ones, because of the contrasting opinions held around them. Now, it has to be known that when one talks about the Seven Modes, every theorist, ancient or modern, means these: Hypodorian, Hypophrygian, Hypolydian, Dorian, Phrygian, Lydian and Mixolydian. Ptolemy assigns one of the seven species of octave to each of these, and these are called Ptolemy's modes, not because he invented them, either one or all of them, or because he ordered them in the way they are ordered, or because he assigned to them those species. In fact, this was done much before him and he found them to be accepted and established by the ancient musicians already from many centuries, with those fundamental rules which we shall see, and they were also practised by singers and instrumentalists just as they would be for a long time after him, until the invasion of the barbarians, when everything was turned upside down. Therefore, they are called Ptolemaic either because none of the authors that we have deals with them better than he does (hence Boethius took from Ptolemy what he says about them) or to distinguish them from [-<262>-] those of Aristoxenus, which are thirteen, as we shall see. The same modes are called more often Tones ([tonoi]), which is a word taken to mean the same, albeit there are some differences, because Tone has the specific meaning of a System or a melody which is higher or lower, even if one progresses through the same species and variation, while Mode has the specific meaning of that or another variation or style, although Mode and Tone are used in both those meanings, albeit Tone is used more often.

Therefore, one must know that the meanings of the word Tone are several, but four are the main ones used by the ancients, as Cleonides notes, Salinas after him, although he interprets it in his own way, and Zarlino and others. Firstly, it is interpreted as [they called Heptatona the Lyre with seven strings, that had but seven notes in marg.] voice or sound, as when Terpander and other ancient poets used it. Secondly, it is interpreted as the measured interval called Tone, which is the difference between the fifth and the fourth and it is represented by the sesquialtera proportion. Thirdly, it is taken to mean the place of the voice, because when someone sings more acutely, we say that he sings higher, as if the voice walked up to a higher place and towards the higher part of the System, or within the lower part, when it sings low. Fourthly, it is taken to mean the span of a voice compared to others, when we mean that someone has a high tone, as the Soprano, or a middling one, such as the tenor, or a low one, such as a Baritone. The word [tonos] comes from the verb [teinein], which means to extend. I will add a fifth meaning to this least, which occurs when we say to sing high, low or in a middling manner, not in terms of high or low [[as Zarlino understood it]]

[Supplementi book 6, first chapter in marg.], but at high, low or middle volume. Of all these meanings, the third one is more suited to our purpose, because in that case it is taken to mean Mode, although, in a more precise way Mode and Tone means only the manner of the octave. Cleonides defines it in this way according to this meaning: [Tonos de esti topos tou tes phones dektikos suste matos, aplates.], which means "Tone is a certain place of the voice which can accept a System and one which is without width." [-<263>-] In order to explain this, let us suppose that someone could not rise higher or descend lower than two octaves or a Bisdiapason. It will be possible to organise a varying number of Systems of octave according to their distance from each other. In fact, the smaller their intervals are, the larger the number of them that will be contained therein. Therefore, if we imagine this span of two octaves as divided into twelve Tones or equal parts, we establish the System of a Diapason and we want to fit it to the extension and height of that span of two octaves, we shall find that it will occupy half of it. For instance, if we place it first in the lowest part, or from the

deepest part of the voice to the middle one, and then we raise it little by little with the notes through each tone until we have placed it in the highest part, we shall find that space, namely, from the middle voice to the highest, will have changed seven positions. This means that that place of the human voice contains a System, which will be explained even more clearly. If we take seven small Harps or seven small lyres built in the ancient style with eight strings, each divided into octaves, which each will be as many systems, but so that those systems are separated each from the other by a tone, namely, that the second Harp is tuned a tone higher than the first one, and the third a tone higher than the second et cetera, and, if we have a singer match his eight lower intervals [-<264>-] to the strings of the first and lowest little Harp, sing the extreme notes in unison and if we have him do the same with the third one and with the others, we shall find that he will always raise his voice until he arrives to the highest sound of that Disdiapason. Then, his highest notes will correspond to the notes and to the strings of the sixth and highest little Harp. However, if we imagine this diapason divided into 224 Semitones or places and we take seven little harps tuned in such a way that two of them are at the interval of a Semitone, while we leave the tone in the other spaces, we shall find that the voice of the singers makes as many change of position, moving across seven systems corresponding to those of the little harps. This occurs because, having divided an interval into two, an interval was left over, and if, for every interval of a semitone which we have made, we apply to the voice of the singer as many systems of however many voices artfully disposed within boundaries of the octave, the same voice and the same System will be able to change position higher or lower thirteen times. If we divide the same Disdiapason into quartertones or dieses and we raise or lower the System through each step one would have the number of variations. This can be also gathered from the neck of a string instrument with a string divided proportionally into the same parts of Tones, semitones or Dieses through the span of two octaves. Starting from the first note or fret towards the high or low register we shall build a System with its corresponding octave, and then we shall raise or lower it gradually. One can understand this also from a ruler divided into twelve equal parts. We measure a span divided into ounces, [-<265>-] according to both ancient and modern practice. If we take a small ruler or a little stick measuring half a span divided in the same way, I will apply its extremities to each division of the entire span until I change its position six times. Also, since we have to conceive the Disdiapason System, to which we adjust all of the other Systems of octaves, as fixed and stable, for this reason it has to be understood as the System specifically called Immobile, which represents the series of the fifteen notes of a man with an ordinary voice who sings in the Tenor range, which are ordered as we saw above, because ancient musicians became accustomed to compare all the species and varieties of the Tones and of the Modes to it. This could be represented ordinarily as an organ of as many pipes, leaving aside the strings which are of variable intonation, or by a flute divided into as many notes. However, to go back to Cleonides' definition, it is not easy to understand what word [aplates] or without width means. Zarlino interpreted as meaning that the voice, when it rises by degrees through the sounds of a Tone and then descends in the same way step by step, it has to go through the same steps or produce the same intervals. Were this true, if ascend through the eight diatonic notes and descend through the eight which are Chromatic or Enharmonic, I would change Tone, but this is not so, since the genera have nothing to do with the Tones.

[Doni, Treatise on the Genera and on the Modes, second book, 265; text: Sistema

d'una Diapason mobile, Immobile disdiapason]

[-<266>-] That the difference between Mode and Tone is not well understood nowadays and of the seven Modes of Ptolemy and of the thirteen of Aristoxenus

Since modern theorists did not understand well this difference, they have fallen into many errors, while, those who have strived to restore the ancient modes have sweated in vain in their toil. [book 4, chapter 12 in marg.] Salinas as well made copious mistakes, as well as others, and it has extracted a very different meaning from the intention of the authors and from certain passages of Ptolemy and Boethius. For this reason he was wrong to reprehend Gaffurio and Glareano because they ascribed the same meaning to Mode and Tone. Glareano was also rebuked wrongly by Maillard, Master of the chapel of the church of Tournai in France, whose only aim in a very prolix book of his written in French is to prove that Tones and Modes are different and that the former are eight and are used for the plainchant, and the latter are twelve and are used in figured music. However, we shall see later how we this difference between Tones and Modes can be squared. Now I shall quote Boethius' words firstly, and then Ptolemy's (but in Greek) although Salinas quotes him in Latin, to check if he has understood them correctly. Boethius says this at chapter fourteen of the fourth book: "Therefore, the consonances of the Diapason consist of species which are called Modes, which some equally call Tropes or Tones." He clearly states in this passage that the words Mode, Trope and Tone have the same meaning and are the same, as it is really true, albeit Tone and Mode differ as well [-<267>-] in the way that has been illustrated. Ptolemy, however, says this at chapter six of the second book:

This means: "However, two sorts of changes occur with regard to the Tone, as it is called: one is when we proceed through all the melody with a higher or lower tension of voice while we keep the appropriate proportion throughout the specie; the other one, instead, occurs when the tension of the voice is not changed throughout all the melody, but only within a part of it corresponding to its beginning. For this reason it is called change of melody than of tone, because the change of the tone does not affect the melody but the tension of the voice, while harmony is altered through the change of the melody." Here Ptolemy means that a melody can be changed in two ways, either singing the same air higher or lower, or by changing just a section of that melody without raising or lowering the voice, namely, by altering the intervals and by placing a tone instead of a semitone or a Semitone instead of a tone, as one can see in these examples.