[-f.1r-] On Music,

by Monsignor Danielle Barbaro.

[Subject of Music in marg.] It pertains to Music to consider and operate around those numbers which relate to others with the addition of the sound. Therefore, we will divide Music mostly [Division of Music in marg.] into two parts, of which one will be subject to the judgment of reason in its entirety, as the one which considers the nature, the different quality and the specific property of each proportion or consonance, and distinguish between those matters which, because of their subtlety, cannot be judged by the ear; the other one is confined to the practical operations, and by being practised [aim of Music, or its effects in marg.] in various ways, both with the voice and with instruments and with composition, entertains the senses of men and provides a respite from their work and offers a gentle occupation in one's life, as in the case of Poetry, which is one of the main parts of this music, as it will be explained at its appropriate place.

[Definition of Music in marg.] Therefore, Music is reason and practice of natural harmony and of sound. Reason does not operate without the participation of the senses, because no judgment can be passed on what someone does not know. Therefore, it is necessary to unite one part to the other, so that first the senses are used, and then reason. [Reason in marg.] So, in order to explain how the sound reaches the ear with a sweet accompaniment, how reason turns to consider the principle from which the voice takes the habit to be regulated and be encompassed by harmony, with which movement it moves and how it achieves its perfect composition, to this end I will say what is voice, how it is produced and by which theory is governed.

[1 in marg.] On the voice and its movements.

[What is the voice in marg.] Therefore, voice is sound caused by the percussion of the air. It varies according to the fact that the air is produced by Man through different natural instruments. [How the voice moves through the air in marg.] The movement of the air which is created by emitting the breath creates various waves in the air, as a stone thrown into the water does. However, there is a difference between the circular waves created in the water and those created in the air, since the former are circular waves which occur on the plane of the water, while in the air they move in every direction and they irradiate both according to height and width, although they are similar in shape to the round waves produced in water because, if those circular waves do not find an obstacle, the second one of them derives from the first one, the third from the second one, and the fourth from the third one until they come to an end.
[The voice moves in two ways in marg.] The voice moves in two ways. Firstly, in the way that we always intend, namely, continuously and without any change until

it reaches silence; secondly, in the way in which we sing or recite the verses of the Poets, rising it and lowering it distinctly, stopping it and starting it again, so that the ear may discern it.

[The continuous voice in marg.] The continuous voice is constantly of a same tenure and it does not pertain to Music, to which the one that moves by distinct steps pertains. Nor this one will be suited to the consonances [continuous voice in marg.] before it reaches a certain stage, as in the case of many bodies which are not capable to fall under the perception of reason if they not reach a certain quantity and size, nor can they be placed in perspective if they do not possess that size which comes between the end of their not being able to be detected and the beginning of their being detectable, because Nature does not allow the smallest differences to be subjected to the human senses. [the senses do not perceives the smallest differences in marg.] [What sound is suited to the melody in marg.] Therefore, the sound divided into steps and reduced to a [-f.1v-] certain perceptible quantity [which sound is suited to melody in marg.] is the basis and beginning of harmony, just as the number one is the beginning of the number, the dot, of the line and the instant of time. Nature has defined the limits of the voice of each person in such a way that the first place of the voice is the deepest and lowest that there might be in anyone, but, since, were the sound always the same and the voice rested on it, there would be no consonance at all, for this reason the sounds and the notes must change and rise, so that the lowest should answer to the highest proportionally. The journey from the lowest to the highest note is called Space or Interval [Space in marg.], and because the way to ascend and to descend is the same, but the comparison with regard to its terms is different, hence we say that, although the space remains the same, when our voice rises from the low register to the high one, then it is made more intense and higher [high voice, low voice in marg], while, when it starts from the high register and arrives to the low one, we say that it is relaxed and becomes lower. Since Nature has given the beginning of the voice to the lower part, and art adopts it, therefore one finds necessarily the greatest term [the extremities of the voice which contain the perfect harmony in marg.] that the voice can reach naturally, not in such a way that that is taken artificially, but in such a way that one might find under it that sound of the voice which, answering the first one, contains the most perfect consonance possible, namely, when one which embraces all of the other species of consonances, so that, if one exceeds it in the high register, one would find any other consonance that the ones contained in the most perfect one [the sounds which are found in the middle], just as one goes back to the number one after one has gone past the number ten, because the number ten embraces all the numbers.
[Barbaro, Della Musica, f.1v; text: Scala [Gamma], A, B, C, D, E, F, G, a, b, c, d, e, f, g, aa, bb, cc, dd, ee. add. in marg.]

However, since one cannot go from the first one to the last one without intervening steps, hence it is necessary that the voice, rising from the first and lowest place to the last one and highest, must touch different degrees which are separated by a considerable space and must be in proportion according to the quality [scale in marg.] which is required. The disposition of the notes is called System by the Greeks and by our compatriots Scale. The Greeks mean by this term a well-ordered composition, while our compatriots intend it as a comfortable and well-ordered line, which has to be understood as composed of line and space, and it is created [space in marg.] in the imitation of a real scale. We will keep ourselves within the established

boundaries and we shall discuss the scales and the disposition of the notes.

[Perfect scale and disposition in marg.] The perfect Scale is the one which goes from the lowest note to the highest and contains all the consonances. This cannot occur if the disposition of the scale does not contain [15 step-wise degrees in marg.] fifteen degrees and fourteen spaces. I call degree the place of the note, whether high or low. Since the beginning of the world the intelligence of Man [The sciences have reached perfection little by little in marg.] has not created the matters of the arts perfectly immediately, but the sciences and the doctrines have grown little by little on the progress made by one's ancestors. For this reason the whole the scale and disposition of the voices was not found in the beginning, but in our time all the degrees, which were less numerous earlier on, have been completely accomplished. Therefore, strings which produced well proportionate sounds were used in creating musical instruments and reason exercised itself on a single string without any music, dividing such string according to proportional numbers in such a way that touching a note and then another one at a specific distance, it produced the consonance required. But perhaps this easy invention was created by expert theorist. [The Monochord in marg.] It is called Monochord an instrument composed of a single string, but the ancients, who were its first inventors, made some of them of several strings and the named the instruments according [Tetrachord, Pentachord, Pentadecachord in marg.] to the number of strings that they added to them, and so they called tetrachord the instrument with four strings, Pentachord the instrument with five strings and so on up to the instrument called Pentedecachord, which means instrument of fifteen notes corresponding to fifteen degrees and rising steps of the voice. [major and minor scales in marg.] The consequence of this is that some scales and disposition are larger and others are smaller. The larger ones will be those that have more degrees, and the smaller ones [-2r-] [largest scale of 15 degrees in marg.] the ones which have fewer. Therefore, the largest one used by the ancients is the one that has 15 degrees, for the above mentioned reason, because one can go beyond with reason, and particularly in building musical instruments, which are more suited than the human voice to carrying high sounds suitable to the melody, which is contained in a balanced way within those 15 degrees, [addition made by modern musicians to the ancient scale in marg.] and if it exceeded them it might be noisy and unruly. Hence, you can see that reason teaches us to make discoveries without using words taken from foreign languages. However, since we are indebted to the ancients because of the effort that they applied in the sciences which then benefit us, therefore, by explaining their obscure terminology, we will be able to learn about their invention and about the one of their successors up to our time. Therefore, we will list the names of the fifteen degrees of the voice as they were called by the ancients explaining their meaning, and we will discover how the ones that are used nowadays are suited to them.

[3 add. in marg.] The names of the sounds according to the ancients.
The first and lowest sound was called Proslambanomenos by the ancients.
The second, which is higher than that one, is called Hypate. Hypaton.
The third one is called Parhypate. Hypaton.
The third is called Parhypate. Hypaton.
The fourth is called Hyperparhypate. et lychanos.
The fifth is called Hypate meson
The sixth is called Parhypate meson
The seventh is called lychanos meson
The eighth is called Meson
The ninth is called Parameson

The tenth is called Trite dizeugemnon
The eleventh is caleld Paranete dizeugmenon
The twelfth is called Nete Diezeugmenon
The thirteenth is called Trite Hyperboleon
The fourteenth is called Paranete Hyperboleon
The fifteenth is called Nete Hyperboleon.. which is the last one and the highest note of the scale.

[Barbaro, Della musica, 2r; text:[Gamma] A, B, C, D, E, F, G, a, b, c, d, e, f, g, aa, bb, cc, dd. ee. Ut, re mi, fa, sol. la] [Cui [Qui ante corr.] trasposte sono anche loro suoni cio è. la terza delle congiunte. La uicina all'ultima delle congiunte la ultima delle congiunte. la causa si dirà poi. Trite synemmenon, Paranete synemmenon, nete synemmenon add. in marg.]

Since the perfect disposition is contained within the fifteen sounds of the ancients called in the way described above, and since all the above mentioned sounds were not discovered all at the same time, it is reasonable to believe that the number of the systems derived from the consideration of the proportions together with the experience of the sounds, and that the first systems were those of the Tetrachords and then those of the other instruments of more strings were invented, and that then these systems were combined together as if a larger number of degrees was added to a scale. This can be seen in the perfect system because it is composed of four dispositions and each disposition is composed of four sounds, which make up a Tetrachord. The first Tetrachord is contained within the sound which is called hypate hypaton and the one called hypate meson. This Tetrachord is called the Tetrachord of the hypate, because it is composed by the first disposition and is on the side of the lowest sounds, and in antiquity hypate meant first or principal in Greek, hence this Tetrachord can be called 'the Tetrachord of the first sounds' in our language.

The second Tetrachord is contained within the sound called hypate meson and the one named meson. This Tetrachord is called 'of the hypate meson' because it is among the first sounds and is found in the middle between the conjoined Tetrachord and the one that is there and composed of the first sounds. Up to this point we have two Tetrachords which create [-f.2v-] an octachord together from the side of the lower sounds.

The third Tetrachord, which is on the side of the higher sounds, is contained between the sound named Neter diezeugmenon and the sound called parameson. It is called diezeugmenon Tetrachord, which means, made of disjointed and separate sounds, because it is equally distant on one side from the previous spaces.

The fourth Tetrachord is the one contained between the sound called netehyperboleon and the one called nete diezeugmenon. It is called Tetrachord of the hyperboleon, namely of the highest sounds and most excellent, since the human voice powered by its breath, once it has reached that limit, cannot go any beyond with ease. These two Tetrachords added here above compose an octachord on the side of the highest sounds, and, added to the first Octachord, they create the Pentekaidecachord, which is the most perfect system, which embraces all of the consonances located in the scale of the 15 sounds mentioned above. From the above given explanation of the tetrachords it is easy to arrive at the explanation of the ancient names of the sounds.

The first sound, which is the lowest and deepest found in the system is called Proslambanomenos, namely, accepted by the others or added-on, because it does not belong to any of the above-mentioned Tetrachords, but it is accepted as an extra note, so that it may correspond as a consonance with the middle sound and it may be separated from the sound called hypate hypaton by the distance of a tone, by which distance the one called meson is separated by the one adjacent to it called Paramese. Modern Theorists identify the [Gamma] ut with this note.

The second sound, or the second note, is called hypate hypaton. One must know that, if we consider and dispose the Tetrachords separately each by itself and not in the perfect system mentioned above, their first and lowest note is called hypate, namely principal or first. So that one hypate of a Tetrachord may be distinguished from the hypate of another one, to this end the first note of the first and lowest tetrachord is called hypate, as the first one of the other Tetrachords, but the word hypaton is added to it, to distinguish it from the others. This note is so called First of the first ones or principal of the principal ones.

The third note is called Parhypate hypaton, namely, the one near the first of the first ones. It is called parhypate, just as the second note of the other Tetrachords, but the word hypaton is added to it to distinguish it from the second note of the other Tetrachords.

The fourth one is called Hyperparhypate, which means above the one near the hypate because this is higher than the Parhypate. It is also called lychanos, which means the index finger, and since the index finger is further removed from the thumb than from the others, and sometimes it is closer to it than to the others, because of this similarity the fourth note, which is the third of the Tetrachords, is closer or further away according to the different harmonies of the tetrachords, as we shall see.

Rule.

One must note that the last note of the Tetrachords, namely, the one which is in the highest part of each of them when they are disposed separately, is called nete, which means the last one. Since the first one was called Hypate and the second parhypate, thus, since the last one is called nete, the penultimate will be called Paranete. These will be the names of the sounds of the notes of each Tetrachord, namely, first one, [-3r-] near the first one, penultimate and last one, but when all the systems are embraced by the most perfect system, then one is not allowed to use the aforesaid names for the reasons which we will tell later.

The fifth note is called hypate meson. This is the first of the second Tetrachord, which is called Tetrachord of the mese, or of the middle ones. Therefore it is called first of the middle ones. This Tetrachord of the middle ones is called in this way because is found in the middle of several Tetrachords. The one which is in the lowest and relaxed part is called Tetrachord of the principal ones. The other one is called Tetrachord of the conjoined ones and it is located in the highest part, but this will be explained more clearly in its appropriate place. Therefore, this note is the last one of the first Tetrachord and the first one of the second. Hence, it seems appropriate that it should not be called hypate meson, namely, first of the middle Tetrachord, but netehypate, namely first and last one. However, if one considers the matter more closely, one finds that this Tetrachord of which that note is the first one is note, is not considered by itself in the perfect system, just as the first Tetrachord is not taken by itself, hence, as the fourth note of the first one is called Nete, namely the last one, if it were considered as a distinct and separate system. Thus, the first of the second would also be called hypate, namely the first one, when the second Tetrachord were considered as a different system. Therefore, we have said that the names of the four

notes of each Tetrachord separately considered in its own system are these, Hypate, Parhypate, Paranete and Nete, namely, first one, near the first one, penultimate and last one, and, since it seems that in truth nature has discovered these names, nor other names than these could be given to said notes by those who are less experienced in Music, since these derive their name from their position and from their order. I say this so that other may not be affected by the great difficulty of the ancient names born of the necessity of this art, nor may they wonder if some new ones may be created legitimately. However, one should not stop to talk about the words, when it is necessary to consider the matter itself appropriately. Therefore, since said Tetrachords are united in one system and the comparisons between the notes are of various kinds, therefore those Tetrachords have different names from those that they would have if they were ordered by themselves. In fact, since a note was added always to the ones already discovered by new inventors, it was necessary to change the name of the first ones altering their comparison with each other. Therefore, since there are two Octochords in the perfect system, one in the low register and another one in the high one, and since the octochord in the low register is composed of two Tetrachords, as the one in the high register, since the name hypate is ascribed to the low notes as the name Nete to the high ones, for this reason these names taken from the Hypate are given to the both of the first Tetrachords of the low register, where the first and lowest Tetrachord is called Tetrachord of the principal ones, while the second is called Tetrachord of the middle ones, and its first note is called Hypate meson. It is called Hypate because it is in the lower register and meson because it is in the middle between the two tetrachords born according to the conjunction, as we shall explain.

The sixth note is called parhypate meson, or, near to the first of the middle ones, and it is the second note of the second Tetrachord. It is called parhypate, because it is near the hypate, and of the middle ones unlike the other parhypate which are in the other Tetrachords.

The seventh is called hyperparhypate, as to mean above the one near the first one, because that is its location.

The eighth is called mese or middle on. Because it is really in the middle, it would be called nete meson, namely, the last one of the middle ones, if the Tetrachord of the middle ones were considered by itself, but, since it is the end of the previous Octochord and the beginning of the one which is in the high register, and it is the lowest note of said Octochord, [-f.3v-] connecting one with the other, for this reason it is called middle one. Moreover, as the first and lowest one called proslambanomene occupied the first place and the last one the last place, thus the mese occupied the middle place in the span of the human voice and the last one occupied the last one. Therefore, we will find that the proportion which has the last one with the middle one is the same as one between the middle one and the first one. It can also be called middle one as it is common to the two Octochords.

The ninth is called Paramese from its position, because it sits close to the middle one.

The tenth is called Tritediezeugmenon, namely, third of the disjointed ones. It is called third because in the ancient instrument of seven notes it was the third in order from the nete. It was called Paramese, namely, near the middle one, and it is also the third one in order from the middle one in the third Tetrachord or in the second Octochord. But, since this note is conjoined with the Octochord of the high register and it is disjointed from the Octochord of the low register, that is to say, it is connected with the notes of the high Octochord and separate from the ones of the lower Octochord, for this reason it is called diezeugmenon, namely, of the disjointed

and separate ones. This will be explained more in detail further on.

The eleventh is called Paranete diezeugmenon, namely, near the one of the disjointed ones, and the last one of the Tetrachord called of the disjointed ones and first of the fourth Tetrachord called of the highest or excellent ones.

The twelfth is called nete diezeugmenon, namely, last of the disjointed ones, because it is the fourth and last of the third Tetrachord, which is called Tetrachord of the disjointed ones, and because it is the first of the fourth of the highest and excellent ones, for this reason it is not called hypate hyperboleon, or first of the excellent ones, but last one in relation to the position that it has in the third tetrachord, where it is the highest one. Therefore, it is better than the other ones which precede it, and, for this reason, it can be the lowest of the last Tetrachord, or rather the first of it. From this it follows that it is called 'the last one' with regard to the previous Tetrachord, and it is called of the highest ones with regard to the following Tetrachord, which is called in this way.

The thirteenth note is called nete diezeugmenon, namely third of the disjointed [excellent add. supra lin.] ones, because it is the thir one in order from the last one placed in the high register, which is called nete hyperboleon, namely, last one of the highest ones. Therefore it is called third one because of its position and of the highest ones because it belongs to that Tetrachord which is called 'of the excellent ones', which is the last one and it is the highest of the perfect system and accomplished scale, quite differently from the third of the disjointed ones.

The fourteenth note is called paranete hyperboleon, namely, penultimate of the highest ones, because it occupies the penultimate place, while the fifteenth note is called nete hyperboleon, or last one of the highest ones beyond which it is not possible to ascend with the rising of the notes in the perfect system.

However, modern theorists call this system the scale and they order the degrees or sounds mentioned above with certain syllables and some letters. They call them [Gamma] ut, a re, b mi, and so on, gradually ascending. They divide their scale into four parts. They ascribe the first part to the bass, the second to the Tenor, the third to the Alto and the fourth one to the Soprano. Thus, they do not appear to be different from the ancients, since it is as if they called the bass Tetrachord of the first ones, the Tenor Tetrachord of the middle ones, the Alto Tetrachord of the disjointed ones and the Soprano Tetrachord of the excellent and highest notes. It is true, however, that they not express this intention so clearly, because they divided the scale into three systems and they call the first degrees clefs in conformity to the real keys, since they open up certain and determined melodies, and thus they clarify the entire system of the scale, just as the material keys do in the turning of the locks, since they open the minds and render what is hidden inside clear to see, and for this reason they also called them notes.

[-f.4r-] Some theorists mark the clefs with these letters a, b, c, d, e, f, and g, saying that some of the keys are low, some are medium in pitch and others are high. The low ones are the ones which are sung with a low and relaxed voice, and they are called the bass clefs. The melody which is sung with those notes is called bass. These clefs are eight and they are marked with capital letters in this way: [Gamma], A, B, C, D, E, F and G. The middle ones are called in this way because they require a voice which is between the low and relaxed and the high and intense. We are used to hear this voice in the tenor and in the alto. These are seven and they are marked with the letters in the lower case, namely, a, b, c, d, e, f and g. The high ones are those used when one sings with the highest and most acute voice. They are five, and they are indicated by letters of the alphabet in the lower case, but doubled, in this way: aa, bb,

cc, dd, ee, ff and gg. Let this be said so that it may be known that the names and the disposition of these matters are created with different aims. Now, let us return to the ancients and after we have discovered the number, the names and the reason of the names of the sounds and of the notes we will also find the reason behind the combinations of the systems which have to be made according to the scope of the harmony.

[4 in marg.] On the sounds and the Intervals.

It is certain that every system is composed of sounds and that some of the sounds are lower and others are higher. This does not happen by chance, but with proportionate ascending and descending movements, where their intervals and positions are determined, but not always according to the same principle, but according to different ones, on the basis of different musical concepts. For this reason it is necessary that in our progress we determine what sound is, how it is considered, how it is accompanied or separated, on the basis of what reasons the intervals and the ascending motions. So that it may be known distinctly what are the systems and the scales according the various principles, and how many and which ones these are, we will explain some words pertaining to the understanding of what has to be said.

As it can be seen from the aforementioned matters, sound is an indivisible occurrence or quality of the voice, whose certain and determined size is at the origin of the melody. Conversely, every melody is broken down to it as its first element.

Some of the sounds lay at the extremities of the systems, others lay in the middle. Of the extreme ones, some are very low and deep, others very high and acute. The lowest are those below which it is not possible to go in the perfect system. The highest are those above or beyond which it is not possible to go in the perfect systems. Of the middle ones, the same are low or high in relation to the others in the same way that the earth, which is the heaviest of all the elements and the fire the lightest, as the two extremes, while the water is light compared to the earth, but heavy compared to the air, and the Air, compared to the fire is low, but is light in comparison to the water, as they are the two middle elements. Thus, the same logical process allows us to understand the extremities and middle parts of the perfect system, which perhaps, before it reached the perfect number of notes, had been invented with the same number of intervals as the elements and with some comprehensively binding principle.

The high sounds originate from swift and thick movements, while the low sounds originate slow and few movements. In fact, although it seems that a single sound is the one that a string tensed on an instrument creates, one must not believe that it is a single sound, but many which seem one because of the great velocity of the movement, [-f.4v-] in the same way that there is the illusion of a circle of fire when a stick lighted at one end is rotated at great speed.

Interval is the quantity of the voice between two notes. The names of the intervals are the one written here below. They are named according to the distance covered and they are based on proportions.

The larger Semitone
The smaller Semitone
The Tone
The Trihemitone
The Ditone
The Diatessaron
The Diapente
The Diapason

The Diapason and Diatessaron
The Diapason and Diapente
The Bisdiapason.

We will endeavour to explain all the intervals mentioned above briefly and in a detailed way and we also add some other ones.

Consonance is a mixture of high and low sounds which reaches the ear and creates pleasure.

The Tone is the basis of the consonance, namely it is its first element and its foundation. It is born of the sesquiottava proportion.

The smaller Semitone, which is called diesis, is that part of the tone by which the sesquiterza proportion exceeds two tones or two sesquiottave proportions.

The larger Semitone, which is also called apothome is what remains of the tone. From here one can see that the word Semitone does not mean one half of the tone, just as the word semivowel is not understood as meaning half of a vowel, but as a sound which is less than a vowel and does not quite achieve the quality of a vowel. We will tell later why the tone cannot be divided into two equal parts.

We must also be aware that the tone and the semitone, although they do not create harmony or form a consonance, nevertheless they have to be considered both because they distinguish the intervals of the consonances and measure the division of the intervals and also because the sole consonances are connected by one and the other, as it will be seen. Finally, they are important because both have the power to move the feelings within our souls.

Comma is the interval by which the tone, represented by the sesquiottava proportion, exceeds two smaller semitones.

Schisma is one half of the comma.

Diaschisma is one half of the minor semitone.

However, before we move on to illustrate the other names of the intervals, I believe that it would be better to demonstrate what has been said above with reasons, examples and illustrations.

Therefore, first of all we must bear in mind and consider in advance what has been said in the Arithmetic around the nature and the properties of the proportions. We must also hold as certain that the proportion that one part of a string has to another is the same that the sound produced by the first part of the string has in relation to the sound produced by the other part of that string. For instance, I have a string tensed over a [-f.5r-] piece of wood, as Musicians use when they divide the Monochord. This string, let us say, is divided into sixteen parts. I mark the half of the string. It is certain that the entire string is in dupla proportion with its half. I say that we should pluck the open string and then you place a fret at the half point and place a finger on it and pluck it. I say that the first sound will be in dupla proportion to the second one. You will have experience if you divide the string in how many parts you prefer. Therefore, if we want to find a tone on a string, we divide it into nine equal parts, marking on it all of the said parts. It is certain that nine parts of the whole string compared with eight parts of it create the sesquiottava proportion, because the number nine contains the number eight once and the eighth part.

Therefore, if the first sound is in the same proportion with the other sound, as the first distance is with the second one, it is certain that the string, when it is plucked in its entirety, will produce a sound which is in sesquiottava proportion with the sound that it will produce when, left aside a section of it, it is plucked when stopped with the finger on a fret. This is the way to find the tone on a string.

[Barbaro, On Music, 5r, 1; text: tuono, a, b, c, 1, 2, 3, 4, 5, 6, 7, 8, 9, sol, fa, re, ut, a. la, mi in marg.]

       Therefore, if we want to move on to other tones, we apply the same method. Let the entire string be divided into nine parts. Mark the first fret at the first portion, where it says c. I say that, so-far, the first tone has been created. Then I divide from c. to b. all the remainder of the string into nine parts, and I leave one marked d. near c. I say that that will be the fret of the second tone, because limit of the first one to the limit of the second one there is the space of one of the nine divided parts, which is the eighth part of the remaining ones. Here one can see that the second tone occupies a smaller space than the first one. I would use the same method

[Barbaro, On Music, 5r, 2; text: dui tuoni contenouatj, a, b, c, d. e. 1, 2, 3, 4, 5, 6, 7, 8, 9, 72, 64, 8i add.in marg.]

if I wanted to find the third tone starting from the fret dino al b. tutto il resto della chorda in parti noue. et sopra la uicina al precedente tasto ch'è la ottaua del residuo, fermandosj.
Thus, you will progress in this fashion as much as you like, and you will find that the more one places a tone next to the other, so much shorter the distance become. However, you will not find that it is possible to divide the tone into two equal parts, because, in short, no superparticular proportion can be divided, because one cannot find in such superparticular proportions a number which can be divided in such a way so that the proportion that it has in its largest term, the same it has in the smallest. Hence, since the tone is in sesquiottava proportion, which is a supraparticular one, it cannot be divided into two equal parts. The consequence of this is that it can be divided into two unequal parts, where one will be larger and the other one smaller. The smaller one is the minor semitone, while the major one is the major semitone. We will tell now how we can place the fret of one and of the other one on the string, starting with the smaller one.
       If I want to follow two tones with a minor semitone, first of all, I will dispose the two tones according to the aforementioned rule. Then I will divide all the string into four equal parts and then I will mark one of them, namely, I say that the distance which goes from the fret of the second tone up to the marked sign is a smaller semitone, because the minor semitone is nothing else but that part of the tone by which the sesquiterza exceeds two tones. Therefore if we divide the string into four parts and we leave one, the remaining part is composed of three parts and between 4 and 3 lay the sesquiterza proportion, if you take from two tones that same string

[Barbaro, On Music, 5r, 3; text: numeri di 5 tuoni 59049. 52488. 46656. 41412. 36064. 32768. 4, 656i. 5832. 5184. 4608. 4096. 3. 729. 648. 576. 512. 2 81. [[7.]], 72, 64, un, 9. 8. sia 724. 518. add. infra lin.]

[-f.5v-] [Barbaro, On Music, 5v; text: a, b, c, d, e, 2. 13. 32. 36. 324. 288. 216. 243. 2, 3, 4 in marg.]

which are two sesquiottave proportions, conversely, you will have put after them the smaller semitone.

But if you want to place them before the two tones, divide the string into four parts and starting from the marl of the first one divide the remaining part into eight equal parts, of which you will add one to the previous part so that all the distance will be of nine parts, which is in sesquiottava proportion with the first eight, namely it represents a tone. If you want to place another tone above that one, divide all that space which was of nine parts which have to be disregarded now, I say, you will divide it into eight equal parts. Of those eight parts you will place one before the point from which you started your division, and thus you shall have the second tone, and also from that last mark up to he beginning of the string you will find the semitone, which is the difference by which the sesquiterza exceeds two sesquiottavi tones. However, if you want to place a smaller semitone between two tones, according to the above mentioned method you will measure a tone on the side of the string, then you divide it into four parts and mark the third one and on it you will create a tone dividing the three parts into eight and selecting one of them. Thus, you will have created a tone towards the first part of the string and another one above the sesquiterza. The distance between one tone and the other one will be a smller semitone, or Diesis, as it may be called, because of the aforementioned reasons. Finally, if you want to place the smaller semitone where it you prefer, you will be able to do it from the previous instructions, noting that the smaller semitone is smaller than a tone by the proportion of 243 to 256, whose difference is 13, which is smaller than ninteenth and larger than the eighteenth part of the number 243.
However, do let us place the larger semitone, called apotome, on the above proposed string. First create the smaller semitone with the aforementioned rules, and let a. b. And c. b. the interval of the smaller semitone. You will divide c. b. into eight equal parts. Add one above c., so that d. b. has 9 parts. Therefore, d. b. and c. b. will be a tone. I subtract from the tone d. b. and c. b. the smaller semitone, namely a. b. and c. b. , which is the distance by which

[Barbaro, On Music, 5v; text: a, b, c, d, e, 143. 156 in marg.]

the smaller semitone is exceeded by the tone. This is nothing but the larger semitone, and, just as you have placed the smaller semitone in the lower part, thus you can also place it with reason in the higher part, knowing that the larger semitone is the remainder left over once a sesquiterza is subtracted from three adjacent sesquiottave.

The Comma is that interval by which the tone is larger than the two smaller semitones. This is equivalent to say that the distance which renders one semitone greater than the other is created in such a way. Place the tone a. b. on the string a. b. [you will place the tone more easily on the string in the manner explained, on the lower part the smaller semitone and on the higher part the smaller semitone placed within that sound already placed. The interval which is between the smaller semitone in the lower part and the smaller semitone in the high part is the Comma. The smallest numbers are 2187, 2048. i944. 256. 243. 8. add in marg.] and let c. b. and d. c. be the smallest terms [256. 243. add. supra lin.] of the smallest semitone. You will divide the interval a. b. into equal parts according to d. From the number of these, starting from b, I take away how many are in the number e. [243. add. supra lin.] and you will mark

f. the extremity of it. It will be certain then that the proportion which exists between d. and c. exists also between a and b. and f. b. Therefore, a. b. and f. b. will be the smaller semitone. Then you will divide the section c. b. into two equal parts according to the number c, and, starting from b. towards a., you will take from those sections according to the number d., and the letter g. will be placed at the extremity of it. It is clear that g. b. and c. b. constitute a smaller semitone, while, having demonstrated that the space f. b. and g. h. Is a minor semitone, it follows that the interval f. b. and g. h. By which the sesquiottava a. b. and c. b. exceeds [-f.6r-] two smaller semitones, and this is none other than the comma.

Now, I want to search for the minimal numbers, in which the proportion of the above mentioned intervals, to avoid entering a difficult discourse which I will embark on further on. Let it be certain for now that the sesquiottava proportion exceeds the smaller semitone, that the sesquinona is the smaller one and that, equally, the sesquiquintadecima proportion is smaller than the proportion which represents the larger semitone, and the sesquiquattordicesima is larger, and that, finally the sesquisettantaquattresima is smaller than the proportion of the Comma, while the sesquisettantatreesima is larger. From this it is possible to understand that these proportions belong to the number of the superpartienti. Therefore, no superparticular proportion nor any multiplex one can fall between the sesquiottava and the sesquinona proportion where the proportion of the dieses is contained, nor between the sesquidedimaquinta and the sesquidecimaquarta, where the proportion of the apotome is contained, nor between the sesquisettantaquattresima and the sesquisettantatreesima, where the proportion of the comma is contained, as it was demonstrated in the Arithmetic, and this is the proof that the above intervals are represented by the superpartiente proportion.

However, the ratios of the schisma and of the Diaschisma are unknown and irrational because they cannot be expressed by any certain and finite number, in a similar way to the proportion ratio of the diameter and the circumference in Geometry, which cannot be found because that ratio is irregular, just as these of the schisma and of the Diaschisma are. Therefore, do let us leave such subtle divisions, and let what we said be enough to show that these intervals do not have that value in music which the Comma, the two semitones and, equally, the tone have, which, as it is demonstrated, is composed of two smaller semitones and a Comma, and it is smaller that two smaller semitones by the interval of a Comma, because, if we subtract a comma from the sesquiottava two smaller semitones are left. By dividing the string, we will be able to see from this that the interval of the smaller semitone is larger than three commas and smaller than four. Therefore, it is clear that the larger semitone has more than fore and les than five commas. The consequence of this is that the tone with its interval occupies a larger interval than the one occupied by seven Commas, because, if the interval of seven commas is larger than the interval of three commas, and the interval of the larger semitone is larger than the interval of four commas, it follows that the tone, which contains the interval of the one and of the other semitone, covers an interval which is larger than seven Commas, and considerably so.

Having understood this, then one can understand very well the ratio of the other intervals, such as the Trihemitone, which spans the interval of a tone and of a smaller semitone, and for this reason it is also called sesquitone.

Similarly, the Ditone is the interval of two tones while the Tritone is the interval covering three tones. And because these terms are necessary to divide the strings, for this reason it is necessary to know the proportions that represent their intervals.

Therefore I say that the sesquitone lays between the sesquisesta proportion and the sesquiquinta. Hence it follows that, although it reaches the ear with a pleasant sound, it is not a consonance, because, as we shall see further on, the consonances are not in superpartiente proportion, which is the one in which they sesquitone is contained. Nevertheless, this reaches the ear with a pleasant sound, as anyone can hear, and it is called a minor third by our contemporaries because, it contains a tone and a semitone within three note-steps, and it is the interval contained between a line to the next or between a space and the next one.

[-f.6v-] [Barbaro, On Music, 6v, 1; text: ut, re, mi, fa, sol, la, dal spacio, exempio del ditono]

as long as a semitone is contained therein, such as in the interval between .re. and .fa. or from .mi. to .sol. both ascending and descending. Therefore, let us set a. 288 b. 256 and c. 243, it is certain that there is a tone from a. to b. and that from b. to c. there is a semitone. Consequently, from a. to c. there will be a sesquitone. I say that it is contained by a proportion which is smaller than the sesquiquinta and larger than the sesquiquinta. Now, I take a fifth of c., which is 243, and it gives 48. 3/5. I call that f. I add f. and c., namely 48 3/5 and 243, and their sum is 29i 3/5. This is larger than a., which is 388. Therefore, the proportion which falls between a and c., namely between 291 and c cioè tra 291, et 243. But the proportion between d. and c. 291 3/5 and 243 is sesquiquinta, therefore the sesquitone has a proportion which is smaller than the sesquiquinta. It is left for us to see that it is larger than the sesquiquinta. In order for us to ascertain which proportion is larger and which smaller without ricorrere to Arithmetical operations shown above, I say that the larger of the multiplex proportion is the one which is named after the larger number. Therefore the quadrupla proportion is larger than the dupla, because the quadrupla derives its name from the number 4 and the dupla from the number 2, and the number 4 is larger than the number 2. The largest of the superparticular ones is the one which is named after the larger part, so the sesquiterza is larger than the sesquiquarta, because the third part is larger than the fourth part, namely, 1/3 is larger than 1/4. To sum up, in the case of numbers and intervals the larger fraction is the one which has the smallest number as its denominator, and smaller the one which has the largest denominator, as we have stated in the Arithmetic. The consequence of this is that if two unequal numbers are compared to a smaller number, the proportion between that one and the larger of the unequal numbers will be greater than the proportion between that one and the smaller than the two unequal numbers. Take two unequal numbers, for instance, 9 and 8.

[Barbaro, On Music, 6v, 2; text: 1, 8, 9]

Compare each of them to a smaller number, for instance 7. I state that the proportion from 9 to 7 is larger than the proportion from 8 to 7. The reason of this is that the whole is larger than the parts taken separately. Therefore, if the proportion which 9 has to 7, which are its extremes, is composed of the proportions of 9 to 8 and 8 to 7, as they are its parts, therefore, the proportion from 8 to 7 is part of the proportion of 9 to 7, which is the whole. Therefore the proportion from 8 to 7, which is 1 1/7, will be smaller than the proportion from 9 to 7, which is 1 2/7. But do let us return to our task and do let us see if the proportion which produces the sesquitone is larger than the

sesquisesta. Therefore, I take the sixth part of c., namely of 243, which is 48 3/5. I mark this with the letter g and I add it to the c. The sum is 283 3/6, which I call e. It is certain that e, namely 283 3/6 is a smaller number than a., namely 291 3/5, and so the proportion of a., which is 291 2/5, which is the sesquiteone is larger than the proportion which occurs between e and c, namely between 283 and 3/6 and the c, which is 243, where the sesquisesta proportion is contained, and this is what we had to demonstrate.

Similarly, the Ditone is half-way between the sesquiterza and the sesquiquarta and it does not contribute to the perfect harmony. This is called a major third, it has three note-steps and it covers two whole tones. It occurs between a line and another one and between a space and the next one, in such a way that it does not contain a semitone in this way, namely, when the voice moves from fa to la or from ut to mi. This proportion is pleasant to the ear, but it is not a consonance, because it is not expressed by a superparticular proportion. It pleases, as hearing it demonstrates. Nevertheless, in order to demonstrate what we have said, place [-f.7r-] two adjacent tones in the smalles possible numbers, such as 81, 72 and 64. I state that the ditone a., namely 81, and c., namely 64, are represented by a proportion which is smaller than a sesquiterza and larger than a sesquiquarta. Now, I take the third part of c.., namely 64, and it is 21 1/3. Mark this as f and add it to the 64. The sum is 85 1/3, which is marked d. It is completely clear that between d. and c. there is the sesquiterza proportion, namely from 85 1/3 to 64, but the d., namely 83 1/3 is larger than a., which is 8i. Therefore, the sesquiterza proportion is larger than two tones, as can be seen easily by placing two adjacent tones on a string, in the way described above, and finding the sesquiterza and the sesquiquarta on that string.
Moreover, this can be understood, namely, that the interval of a ditone is larger than the interval of a sesquitone by the interval of a major semitone, because if a sesquitone is the interval of a whole tone and a smaller semitone, it follows that the interval of a larger semitone is needed to complete the interval of two tones.

What is common to all of the intervals described above is the fact that they are all used in Music. The tone, which is the interval of the voice rising from a line to a space, when there is no semitone, which occurs when the voice ascends from the .mi. to the .fa. or descends from the .fa. to .mi. These are used as basis of the melody and as linking intervals, while the Trihemitone and the ditone and the others are used because they are pleasant to the ear, albeit they do not produce a perfect consonance. [The Unison is the same continuous tone of the voice, which is not raised or lowered. It is not an interval, but it is the foundation of the intervals in marg.] When to notes are on the same degree, they are said to be in unison, as if they were on the same line or in the same space. Conversely, when they are on different lines or in different spaces, they produce a perfect consonance or they please the ear considerably, as the minor third, the major third and other similar ones.

[Barbaro, On Music, 7r; text: ut re mi fa sol la]

The perfect consonance is understood in two ways, either in relation to those sounds which are just pleasurable to the ear and do to achieve the perfection of the consonance, as the ones already mentioned, which are called emmeli, namely, suitable to the melody, the opposite of which are those called ecmeli, or not belonging to the melody, and which do not please the ear, or in relation to the largest consonance which contains all the other ones within itself.

The consonances are simple or compounded. The simple derive from the simple proportions and the compounded from the compounded proportions.
The simple consonances are three. The one that is called Diatessaron is placed in the sesquiterza proportion. The one that is called diapente is born of the sesquialtera proportion. Finally, the one that is called Diapason derives from the double proportion.
However, it is not necessary that all the simple proportion produce the simple consonances, because the consonances are not derived from the superpartienti, as it will be explained further on.
The compounded consonances are the ones that are called Diapason diapente, Diapason diatessaron and disdiapason.
Now every consonance will be explained separately.
The Diatessaron consonance is called a fourth because it is contained within four note-steps. It covers two tones and a smaller semitone, as it is from ut to fa, from re to sol, from mi to la. This occurs when the voice leaps from whichever line one wants to the second space above or from any space to the second line above.
This consonance is placed on the string by dividing the string into four equal parts and placing the fret on the point of division of the first part, because the whole string, which has four parts, forms the sesquialtera proportion with the three parts of it. From this proportion the said consonance is born. One can see that it does not reach the interval of three tones, but it is composed by two tones and a smaller semitone. [-f.7v-] It is also very clear that a ditone is smaller than said consonance by the interval of a smaller semitone, while a sesquitone is smaller than it by the interval of a whole tone. Finally, it is clear that said consonance occupies the interval of five dieses or two minor semitones and two commas.
The diapente consonance is called a fifth because it ascends or descends with the voice only by five steps. It is the leap that occurs from any line to the third line above and from any space to the third space above, as from ut to sol, from re to la, from mi to mi, from fa to fa. This consonance is placed on the string by dividing it into three equal parts and putting a fret at the end of the first one, because the whole string, which is of three parts is in sesquialtera proportion with two parts of it. From this ratio, the consonance called diapente is derived. It is composed of three tones and a smaller semitone. Hence one can see that three tones are smaller than said consonances, and four tones exceed it. Since it is composed of three tones and a smaller semitone, if a tone is taken from it, what is left is the diatessaron consonance, and, conversely, if a diatessaron is subtracted from it, what is left is a tone. On this basis one can discuss the matter and find that the diapente is smaller than eight smaller semitones, that it is combined with a ditone and a sesquitone, and that the difference which exists between the diapente and the diatessaron is non other than a tone. Therefore, if one adds a tone to the diatessaron, the result will be a diapente. Both of the above mentioned consonances are placed in the largest superparticular proportions because one it is placed in the sesquialtera and the other in the sesquiterza, and there is no superparticular proportion which is greater than the sesquiterza and than sesquialtera, as the ones which have the second and third part as denominators, which are the largest parts that there are, and one follows the other in order. One can see, in fact, that the half and a third are larger parts of a whole than 1/4, 1/5, 1.6, 1/7 and other parts, since the greater the denominator, the smaller they become.

Apart from this, neither two diatessaron consonances nor two diapente can be

consonant, because both this and that consonance is not placed in the multiplex but in the superparticular ratios, and we said above that there is the same proportion between sounds as there is between distances, while we have demonstrated elsewhere that similar spaces that are not in multiplex proportion cannot produce an interval which is multiplex and superparticular, and in this case their sounds will not be in multiplex or superparticular proportion and therefore they will not be consonant, because every consonance must be either in multiplex or in superparticular proportion. The above mentioned reason is useful to us to demonstrate that, adding together as many diatessaron and diapente as one wants, there will never come as a result any consonance.

What is the reason why the consonances are found within the multiplex or superparticular proportions but not within the ones which are superpartienti? I reply that the consonances are found in those comparisons of the highness and lowness of the notes whose common measure is clear, as in the duple in the multiplex, where the measure is the part which is the difference between two terms. For instance, between two and 4, the two is the measure of one and of the other. Between 2 and 6, which is the tripla, the two is the measure of one and the other. Between 9 and 0, the measure is the number one, as it is found to be the case in the superparticular ones. Now, in the sesquialtera, such as from 4 to 6, the 2 is common and visible measure of both, as it is of 6 and 8, which are in sesquiterza proportion. This does not happen in the superpartienti. Now, if we compare 5 and 3, which is a superpartiente proportion, the 2, which is their difference, is not measure of neither of them, because if it is taken once, it is smaller than the 3, and, if it is taken twice, it is more than 3 and less than 5. If it is taken three times, it is more than 5. The same can be seen in the rest of the superpartienti proportions.

Willing, as we are, to continue our task, we will talk about the consonance called diapason. This consonance derives from the dupla proportion. In fact, if we divide the string into two equal parts we will find that consonance. This consonance occurs by leaping from any [-f.8r-] line to the fourth space above, or from any space to the fourth line above. It is called Diapason, namely, 'through all', because it embraces all of the above mentioned intervals. It is called the octave because the voice ascends or descends by eight degrees.

However, there are many other intervals noted by Musicians which are allowed, since they are not without sweetness, for instance, if one adds a semitone to the diapente, which is the ascent of the voice from any line to the third space or from any space to the third line, which ascends up to the sixth degree and contains two semitones, such as the mi and the fa sung throughout the sixth. Similarly, the tone with the diapente, which is called major sixth, such as is ut and la. This occurs when one moves from any line to the third space above and from any space to the third line, and it has to contain only four tones and a semitone. Similar are the minor seventh, the ninth, the tenth, the eleventh, the twelfth and the others named by the theorists. It is necessary first of all to practice singing first of all, because the ear offers the reason the occasion to make many and excellent discoveries.

If we place five adjacent tones on the note on the string, according to what we have said, we shall find that they will not reach the half of the string, while, if we place six adjacent ones, we will find that they will exceed the half of the string. Therefore, we have that the diapason, whose proportion is the dupla, measures more than 5 and less than 6 tones. We will also find that that consonance results from the union of the diatessaron and the Diapason, because the dupla is born of the sesquiterza and from the sesquialtera. Take the interval A. b. c., with a. b. in

sesquialtera proportion such as 6 to 4 and b. and c. in sesquiterza proportion such as 4 to 3. I state that a. is in double proportion to c. This is proven in this way: if two 6s equals four threes, it follows that six equals two 3s., because, when two whole numbers are equal, their halves are equal, and, since two 3s equal six, since it is equal to two threes, it will be equal to twice the number three. However, these are matters which are demonstrated properly in the Arithmetic.

Next, we can see that, since the diapason consonance is of five tones and two smaller semitones, it is smaller than six tones by the interval of a comma. Therefore, if we subtract from said consonance the diapente, what is left is the diatessaron, and, conversely, if the diatessaron is subtracted from it, what is left is the diapente. Finally, if one subtracts from it a tone and the diapente, what is left is a sesquitone.

It has to be known that no simple consonance can be divided into two equal parts with a certain and finite number. As to the diatessaron and the diapente, this is manifest, because they are represented by the superparticular proportion, which cannot be halved. The same will be judged of the diapason, because, since the two minimal numbers of the consonance one and 2, and since 2 is not a square number, it follows that the diapason, which consists in the proportion from two to one, will not be able to be divided into two equal parts, nor into more than two, because it has been demonstrated in the Arithmetic that there is a middle number between two square numbers in proportion, and we said above, that the ratios, which cannot be represented by a certain and finite number, are irrational and unknown. Therefore, since we know from Arithmetic that the product of a square number with a number that is not square is not square, and, if this one is not square a proportional middle number cannot be found between those numbers, it follows that there is no middle proportion [-f.8v-] among the multiplex ones, since we said in the arithmetic that the half is nothing but a connection between the extremes because of the ratio between the one and the other in the middle, because this ration can be between one and two, where two is the double of one. However, do le us refer to the discussion of the halves explained elsewhere

The diatessaron and diapente, which is the first of the compounded consonances is a single consonance, rather than two, and it is called the eleventh. Many maintain that it is not a consonance, although it reaches the ear with great sweetness. This is certain, because every consonance consists in a multiplex or superparticular proportion, and this one is in neither one of them. Take 2 as a. and the number one as b., which are the minimal numbers of the diapason. Take 4 as c. and 3 as d., the minimal numbers of the diatessaron. If I multiply c. by a., or 4 by two, the product is 8. I call this e. I multiply d. and b., namely three and one, and their product is 1/3, and I call this f. It is certain that e. To f. contains a dupla and a sesquiterza, because it has been demonstrated (this is shown in the Arithmetic) that, if a proportion is added to another, as if the third is added to the fourth, it will follow that the consonance composed of the first and of the fourth will be equal to the one composed by the others. Therefore, how much the proportion 1 to 2 adds to the proportion 3 to 4, the proportion between 2 and 4 adds to the proportion between 8 and 6. I state that the proportion composed of the proportions from1 to 2 and and from 6. to 8. will be equal to the proportion created from the other two, namely from 3 to 4 and from 2 to 4. This is demonstrated in the Arithmetic. For this reason now I say that c., which is 8, is not multiple of f. (which is 3) nor it is superparticular. Therefore the diapason diatessaron is not a consonance.

The diapason diapente consonance is called twelfth. It is a single consonance placed in the tripla proportion, because it is born from a dupla and a sesquialtera,

which are the diapason and the diatessaron, whose proportion is 3 2 or 6 4.
The diapason diapente exceeds the previously mentioned consonance by a tone, and, because it is not represented by one of those proportions which create the consonances, it cannot be called a consonance, but it ear delights in it because it reaches it with sweetness.

  Finally, there is the bisdiapason, which is placed in the quadrupla proportion because it is constituted by two diapasons, which are each in dupla proportion, and of two intervals of a dupla the interval of a quadrupla is created. The ancients placed the appropriate upward limit of the notes and sounds orderly regulated by the voice within this span, as the first and the last interval of the perfect scale and system span the fifteenth. Who wants to add to it more notes and more span, because the fact that many instruments can produce higher sounds and for other reasons, will not find other ratios and proportions than the ones contained within the bisdiapason. In fact, he will recognise the same ones and fill repeat the same ones that he has established earlier.

  However, now that we have discovered all of the consonances, let us see how they can be placed orderly on the said string.
Divide the string .a. b. into four parts and mark the fourth part c. Move away from c. by such a distance that you may find the third part of the string, which will be called d. Moving further away, mark the half of the string with the letter e. And then at its third of the string place the letter f. and at the end of the three fourths place the letter g, along the entire span of the string. I say that you will have divided the string according to the said consonances, namely, diatessaron, diapente, diapente diapason, diapason and bisdiapason, because a. b and c. b. sound the diatessaron, A. b. and d. b. sound the diapente, a. b. and c. b. sound the diapason, a. b. and f b. the diapason and the diapente and a. b. and g. b. the bisdiapason. If you place two strings in unison and divided as above with the same method, you will be able to judge or understand the consonances placed in the way mentioned above. The span of the diatessaron with the end of the diapente sounds the interval of a tone, while it [-f.9r-] does not sound well with end of the diapason diapente. But at the end of the disdiapason one hears the disdiapason diapente. Similarly, you will find that the end of the diapente with the end of the diapason sounds the diatessaron, and the end of the diapason diapente sounds the diapason, and with the end of the bisdiapason is sweet and suave, but it does not constitute a consonance. If you want to mark with numbers the produced consonances, take a string of 24 parts, and take away a fourth and mark it i8, then take away a third and mark it i6, then take away one half and mark it 12, then out of all of it mark a third with the number 8 and, finally, mark a fourth with the number 6. Thus you will have found every consonance and their numbers, because the whole string of 24 parts is in sesquiterza proportion with i8 parts of itself, which represents the diatessaron; the whole string is in sesquialtera proportion to the section composed of i6 parts, which represents the diapente; the whole string is in double proportion with the section of i2 parts, which creates the diapason, and it is in tripla proportion to the section marked with the number 8, which ratio represents the diapason diapente; and, finally, the whole string is in quadruple proportion to the section marked with the number six, which produces the disdiapason. And so-far I talked enough about the consonances.

  From what was said one can gather that some sounds are suitable for the melody and others are not, as those that are not divided into intervals, the indistinct and the very small ones.

  Of those which are suited to being sung, some reach the ear with a pleasant sound, others have also this added effect, of producing a similar sensation to each

other, and, finally, others are so sweet and corresponding between each other that they do not appear to be two distinct sounds, but one, although they are produced by two different notes. Those which reach our senses with a pleasant sound are called Emmeles, as I said, which means suitable to produce a melody. Conversely, those which partake of a certain similarity between each other are called simphonj, which means consonant. The thirds, the sixths, the elevenths and the ninths and those other intervals which are not consonant but delight the ear belong to the first group. The diatessaron, the diapente and the diapason diapente belong to the second group, while the diapason and the disdiapason, namely, the Octave and the decimaquinta (or, which is the same, the dupla and the quadruple which are the most perfect, sweetest consonances and nearest to the unit) belong to the third group. However, since the height of the steps of the sounds depends on the knowledge of the intervals, and the intervals are different, in order that they may be allocated the right proportion it is necessary to know the different character of the various intervals.

Therefore, I say that the intervals are different on the basis of their size, since some are larger and some are smaller, as we have seen.

They are also different because some are composed of consonant sounds and corresponding to each other, as those which compose the proportions of the diapason and of the disdiapason. Others belong to the dissonant sounds, as it is the one which sounds from the end of the diatessaron to the end of the diapason diapente, while others occur among sounds which, following others at different times, produce a regular melody with rhythm and sweetness, ratios and proportions. These are called paraphoni, namely, sounding beyond, but they belong to the consonant sounds such as the diapason diapente, the diapente and the diatessaron.

The third difference among the intervals consists in the fact that some are compounded and others uncompounded. Uncompounded are those which are contained within continuous sounds, as the one of the hypate and the one of the parhypate, and the others which follow. Conversely, compounded are those which derive from sounds which are not adjacent or subordinate one to the other, such as the one of first one and the one of the index, which is called lychanos, or the one of the first one and the one of the middle ones. It is accepted that there are certain intervals which are in common between the compounded and the uncompounded, such as the ones which occur between the semitone and the ditone. We shall explain later the reasons behind this matter, but for now, if we suppose that the sizes of some intervals are shared between the compounded and the uncompounded, for this reason their composition does not originate from the size of the interval, but from the sounds which contain it, because the ditone, which is contained by the index and by the mese is an uncompounded interval, but the one which is contained by the mese and the near to the first one, since there are other sounds which lay in their midst, for this reason that interval, I state, is called compounded, because the quality of the uncompounded doe s not lay in the size of the intervals, but in the notes which are contained within those.

[-f.9v-] The fourth difference is that, while certain intervals are regular and their distances and their numerical proportions can be found, as we have seen in the sounds mentioned above, others are irregular, and they are those whose appearance and ratio cannot be expressed in numbers, as in the case of the Schisma, diaschisma and others.

The fifth difference is taken from the variety of the genera. Genus is a certain division of the intervals in the scales and in the systems which represents the different harmonic Ideas. One must be extremely careful because, since the above consonances

are the only ones at the basis of any harmonic composition, but the divisions which added to each other lead us to them are much more numerous and follow the character of the system. For instance, if the diatessaron consonance is composed of two tones and a smaller semitone, is it not possible to place, on the said string, first the minor semitone, and the two tones, or first the two tones and then the semitone? Can one not place it in the middle? Can one not make a ditone and a Trihemitone or sesquitone? Finally, as long as the interval ends in said consonance, is it not possible to start ascending from either the larger or from the smaller interval? This difference in the way of dividing the intervals derives from the different genera and ideas of the melody, of which it is necessary to talk about now.

[5. in marg.] Three are the genera of the melody, namely, Chromatic, Enharmonic and Diatonic. They take their name from the how close or fare removed are the intevals in the scales and in the systems.

The Enharmonic is the one which there are many very small intervals close to each other. Its name means 'organised together' and 'adapted together'.

The Diatonic is so called because it is abundant with intervals of one tone, hence its name means abundant with tones or proceeding through tones, and the voice is very intense in those.

The Chromatic is the one which is richer in semitones in his division. The word chroma means colour, and it is called thus because like a colour it changes from its first inception.

The Diatonic is the nearest to nature of these three genera, because it occurs almost by itself to anyone who sings without having been taught. The chromatic is more artificial and it is the kind of genus that can be used only by those who have studied music. The Enharmonic is the most effective and it is the one adopted by the most excellent Musicians. It is the most beautiful of all the combinations of intervals and many do not allow it because of their own lack of expertise and we will not be able to practise it as easily as we practise the others. The Diatonic is serious, strong and constant, and it highlights manly behaviour and attitudes. The Chromatic is soft and plangent, and perhaps it has taken the name from the colour because it is shimmering and changing, as colour is.

So, when we happen to want to create a system and a scale, it is necessary straight away that we should know according to which one of these three genera we should divide it. Then, each genus can be divided in several special ways, and these particular divisions of each genus confer upon it a certain appearance and shape, and they colour them just as Painters do, so that they may be heard according to the sentiments that they want to express, grand, constant, soft and singing, mixed and middling, since every beautiful effect of harmony consists of this. As to the Sentiments, we shall discuss them later.

Therefore, I find that eight are the colours or the set divisions of each of the aforesaid genera. One belongs to the Enharmonic, two to the Chromatic and five to the Diatonic. I do not thing that it is difficult to understand why the Diatonic genus can be coloured in more ways than the others, and similarly why the Chromatic has more division than the Enharmonic. In fact, since the intervals in the system of the Enharmonic genus are very close to each other, they are not able to withstand any smaller division, because, since they almost escape the senses because of the small distance between one another of them, what would they do if they were smaller? It is certain that not even the intellect would be able to regulate them through numbers, and certainly the ear would not allow them, therefore, this genus is happy with a single colour, which is the same as the division of its genus, because [-f.10r-] it is, in

as far as it can be regulated, of a single shape and appearance. As to the other genera, the larger their interval, the more they can be divided in different ways, hence the Diatonic has more colours than the Chromatic.

We will provide the examples of all the above mentioned colours creating their tetrachords, because the Tetrachords are the principal parts of the harmonic systems.

So, The system of the Enharmonic Tetrachord, placing the first note in the low register, goes from the sesquiquarantacinquesima to the sesquiventitreesima to the sesquiquarantacinquesima and it embraces the first Tetrachord according to the consonance of the Diatessaron [and hence it moves to the sesquiquarta and it returns descending from the sesquiquarts through the sesquiventitreesima in marg.]. It proceeds from the Diesis to the diesis to the ditone in its intervals. Here the diesis is one half of the minor semitone which derives from the division of the extremes of its disposition, in such a way that the one which is higher in pitch is larger and the one which is lower is smaller. The Diesis is also called tetartemoria in Greek. Here is the disposition of the extremes.

[Barbaro, On Music, 10r; text: semiton minore, 256. 243, differenza, 262. 270, Diatessaron. 92, 70. 1 1/43. 1 1/23 1 ¼, Chroma molle, Nete, paranete. parhypate, hypate. Encharmonico, 8, 15, 69. 10, 18. 42. 365, 360, 345, 270. 280, 275, 252, 270. i numeri grossi sono le differenze degli spacj. 22, 1 1/21. 1 1/11. 1 1/6 non languido, 4, 7, ii. 88, 84, 77, 68. prima, 15, 2i, 1 1/20, 1 1/9, 1 1/7, diatonico, 4, 8, 9. 84, 80, 72, 63. seconda, 56. 1 1/21. 1 1/7. 1 1/8 diatonico intento, 8, 27, 224, 2i6, 189. 168. terza . 3, 1 1/10, 5, 1, 12, 10, 9.]

The one of the minor semitone is i3, as we have said above, and it is the same as the difference from 256 to 243, which is also 13. This difference is divided into two parts, a larger one which is 7 and it is placed in the high register, while the other one, which is 6, is placed in the lower register. Hence you can see how small are the intervals of the Enharmonic melody, since they can barely be ordered by reason, let alone be distinguished by the ear. You can see herewith how the diatessaron consonance is embraced by 4 notes or sounds under three intervals, and it is reached with interval and steps of different size according to the division of the systems of the different genera and of different colours.

Therefore, let the first sound or the first note called hypate to the last one called Nete be in diatessaron proportion, namely sesquiterza, and let the first note form the proportion 1 i/45 with the second one, I say that we will have formed the system and scale of the Enharmonic Tetrachord, because the voice or sound ascends from a diesis through a diesis to a ditone, which can be understood with the numbers in the illustration here at the side, and there is no other colour or division of the Enharmonic genus because of the above mentioned reasons.

The division which is called of the soft Chromatic is the lowest in the first colour of the genus called Chromatic. It ascends from the sesquiventisettesima through the sesquiquattordicesima to the sesquiquinta, and descends in the opposite way. Nevertheless it produces the diatessaron consonance with the extreme sounds of the tetrachord and it cannot produce another consonance moving through such intervals. It is called soft Chromatic because it is shimmering, plangent and stirring.

In the second colour of said genus the highest and most acute section is the one which goes from the sesquiventunesima through the sesquiundecima to the sesquisesta, because, since the first two intervals are disposed in the said manner,

nothing can result in the third interval but the sesquisesta proportion, and here the diatessaron of the Chromatic Tetrachord comes to an end with the second colour which is called syntonic. This colour is called syntonic, or strong, or well tensed and less languid, because it has less of the soft, shimmering, plangent and emotional. One can consider here how it is necessary to entwine the systems according to the degree of tension, so that the music may achieve the praise which gave so much glory to the ancients. But, one can see here that the consonance contained between the two extremes even in these two tetrachords is the diatessaron, which is completed by ascending through different steps in one and in the other colour.

In the first colour of the diatonic genus, the one which is softer and more relaxed, one rises from the lowest and deepest register to a sesquiventesima through a sesquinona, and if one wants the first note to be at the correct distance to the last one, it is necessary to do so through a sesquisettima. It is called soft because it produces an temperate and quiet habito effect.

In the second colour of said genus, the one which is more intense but still not absolutely strong [-f.10v-]

[Barbaro, On Music, 10v; text: diatessaron, 24, Diatonico sintono, nete, paranete, parhypate, Hypate, 1 1/15, 1 1/8, 1 1/9,6, 10, 8. 96. 90. 80. 74, semitono minore, 13, 27. 24. 256. 243. 2i6. 142. aggiunta, stabile, prima delle prime, prossima alla prima delle prime, instabile, Indice, mezzane Mezzana, disgiunte, Terza, Penultima, Ultima, Eccellenti]

starts with the sesquiventisettesima proportion contained within the interval from the first sound to the second sound, and the later with the third one contains the sesquisettima, and this one cannot but ascend by a sesquiottava, in order for it to be consonant. It is called soft intense, because it is midway between the previous soft one and rather languid and the following one, which we will describe now, but it does not achieve the appearance of virility and strength of the latter.

The third colour occurs when the voice, having established its first note with the lowest sound, ascends to the second with the sesquiundecima proportion and from the et dal secondo partendo s'inalza una sesquidecima et ferma il suono nel terzo luogo, and, wanting to rise with a sweet melody it rises by the interval of a sesquinona proportion necessary to produce the required melody, which embraces the diatessaron consonance in four notes and three intervals. Who cannot see how well structured is the progress and the ascen of this disposition, which rises by three continuous proportions as the one mentioned above, namely the sesquiundecima, the sesquidecima and the sesquinona. For this reason it is called regulated diatonic, or, to be more precise, equal diatonic.

The fourth colour draws and colours this genus starting from a sesquiquintadecima. In the middle section it creates a sesquiottava and it completes its ascent with a sesquinona, nor it is possible to make a different interval, if this tetrachord has to be completed appropriately. This tetrachord is serious, strong, it shows a masculine character and it is very intense, and for this reason it is called syntonon.

Finally, the fifth one is called diatonic because it is rich in tones. It starts with the smaller semitone in the first interval; it moves on with other two tones and closes the scale and the system of its Tetrachord in the diatessaron consonance. This is the strongest and most powerful of all the others, as those who can climb with a larger

step. This is the description of the colour of every varied genus according to the intention of the composers and one has to pay great attention to this.

[6. in marg.] Second division of the genera.

There are other common genera besides the ones mentioned, which are called mixed.

The mixed genera are the ones in which there are two or three colours together, as it is the one which is composed of the Diatonic and the Chromatic, or the one which is made of the Diatonic and by the Enharmonic, or the one made by the Chromatic and by the Enharmonic.

The common ones are the one which are made up of stable sounds. I call stable the sounds which are stable. I call stable sounds the ones which, among the 15 of every musical system of whichever genus or colour, are fixed in their position as limits within which the consonances are contained. Conversely, changeable are the ones which change their intervals according the different genera ad colours, making them wider or narrower according to the genus and the colour, as if they were a scale, or, of many that they have, some degrees are always placed at the same distance, being principal and regular, while others are placed at variable distances according to some intention of the composer. However, we will demonstrate how this matter lay both with examples and verbal explanations further on.

Now, I state that in the systems, when one starts from the first sounds, one is free to arrive to the note which one prefers, because this Choice depends on the intention of the Musicians derived from human nature, because, since they realised that nobody delights in musical modes which resemble their traditions and behaviour, as association breeds affection and delight, they have found, in short, three modes reflecting the nature of the three nations, while other modes are subordinate to these. The Mode is also called tone, as also Modern theorist call them, namely, first, second, third and fourth tone, and it is nothing but the place where the voice lay. The modes are three, according to the ancients, namely, Dorian, Lydian and Phrygian, and they were called thus from the people who invented them.

[-f.11r-] The Dorian is assigned to the deepest effects of the voice, the Lydian to the highs and the Phrygian to the middle ones. The other modes, of which we will talk later, are considered in the compositions for several instruments, whose realised sounds are contained by a very wide system.

Besides the three systems mentioned above there are these ones: the hypodorioan, the hypolydian, the Hypophrygian, the mixolydian and the hypermixolydioan.

Now, I will discuss the opinions of the ancients on the subject of the tones in greater detail, so that it will be clear to see what the achievements of modern composers are and how they are lacking in comparison to their predecessors.

Since I have considered so far the differences between the sounds in as much as they are pleasing to the ear in their combinations, and I have understood how the consonance is the sweet mixture of low and high sounds at the same time and the fact that being regenerated as to its sweet quality, it is found both in one and in the other of its terms, certainly we can investigate how the consonances have to be mixed together, since there would be no positive effect from holding the same consonance still, which is born from the same sounds, while it is necessary to consider certain differences between the sounds which, albeit are placed in ratios and proportions just as the consonances are, and in those sweet mixtures of sounds which delight our ears, nevertheless they have different rations from those of the consonances, because they

are intervals in which the ways to connect and weave the intervals and the musical compositions consist. Nevertheless, it does not follow that where there is a consonance, there is necessarily the mode, because the mode is nothing but the mixture of consonances, just as the consonance is the mixture of sounds, but there is a difference between this two types of mixtures, in that , the mixture of sounds is perceived in an instant, since with open ears, as I would say, the fourth, the octave, the fifth and the fifteenth are heard, because the sound and the terms which constitute each consonance allow themselves to be produced at the same time. However, the mixture of the consonances and their cadences do not occur in an instant, but they are examined and produce their effect in succession. From this derives what people say when they hear a composition, when they call it cheerful, tearful, relaxed or impetuous, sweet or bitter, and so on. Therefore, the mode is what gives the affective character to the composition. This mode is also called tone and, as I have said, it is classed according to the names of certain peoples, who, according to their nature, enjoyed one more than the other. These were the Lydians, the Phrygians, and the Dorians, from whom the tones are called Lydian, Phrygian and Dorian. Later on these others where found, and these are the hypolydian, hypophrygian, hypodorian, Mixolydian and hypermixolydian, which we mentioned above. It remains to us to discuss them in a clear way, according to the task that we have set ourselves, but first we will say some things about the systems and the scales, so that the novelty of the words may not preclude our understanding.

System is a structured span divided into intervals, as we said. Modern theorist call it scale.

There are seven different systems, of which four are the same ones with their differences consisting in the intervals and three are specific to those four.

The first difference is according to size, because the largest system is the one which embraces the largest intervals and the smallest one the one which embraces the smallest.

The second difference is according to whether the sounds are consonant or dissonant, because some systems are contained within consonant sounds and other within dissonant sounds.

The consonant intervals in the immutable system are these six.

The Diatessaron is contained by the hypate hypaton and the hypate meson, and it is composed by two tones and a smaller semitone, as we have said.

[-f.11v-] The diapente is contained within the hypate meson and the paramese, and it is composed of three tones and a smaller semitone. It is also contained, in the lower register within the proslambanomene and the hypate meson.

The diapason is composed of three tones and two smaller semitones, as from the proslambanomene to the mese and from the mese to the nete hyperboleon

The Diapason diatessaron, which many want to consider as a consonance, is composed of seven tones and three smaller semitones, as they occur between the proslambanomene to the paranete of the disjointed ones.

The Diapason diapente is of eight tones and three semitones, as it is from the Proslambanomene to the paranete of the disjointed ones.

The bisdiapason is of ten tones and four minor semitones, as it is from the first to the last one.

The dissonant intervals are all those which are smaller than the diatessaron, and in short all the ones which are found interposed among the consonant ones. The third difference is taken from the genera because it occurs that some systems are made of a same size, but they are ordered according to uncompounded ratios and

different ratios because their sequence and position allows them to be altered when some difference occurs. In fact, the systems composed of features entirely similar and equal do not create any difference, and, therefore, Music would have hardly any effect without the variety of the genera, of the colours and of the tones. Therefore, let us see where the features appropriate to each genus lay in the appropriate terms of the proportions. I say that the positions and the shapes or forms of the Diatessaron are three, those of the Diapente are four and those of the Diapason are seven.

But in order that what we have to say may be better understood we will provide some terms and their composition before hand, according to they way in which they have been disposed by the ancients in the treatment of the difference of the sounds, albeit we bear in mind that these mentioned are none other consonances than the ones already mentioned. Let us place this, as an example of what has to be said. The diatessaron consonance is composed of two consonant sounds in the sesquiterza proportion. We have seen that from the first to the last one, namely, moving from one extreme to the other, the voice and the sound make three steps, as it has been said in detail. It is certain that three intervals are contained within four degree of voice. I say that the ancients considered the first two intervals which are contained within three degrees of voice and they compared them to the third one. Since they found that the third interval was larger by itself than the first two intervals, and, although the third one could observed to be larger than the first two united, while the same consonance was maintained between the first and the last note, for this reason they have called that disposition of the three sounds which create hurriedly two intervals Systems; and since this consonance is found in the low, high and middle register, and has its first intervals in each of them smaller than the last one, for this reason they called those sounds or the intervals thick (some low and thick, others medium and thick and others high and thick); and from this the species of each consonance have been distinguished, and they found that the species of the Diatessaron are three, while four are the ones of the diapente and seven are the ones of the Diapason. However, let us first say how many the high thick ones are and how many the others ones. I say that the high thick ones are four, namely, Lychanos hypaton. lychanos meson, paranete of the disjointed ones and paranete of the highest.

The middle thick ones are Parhypate hypaton, parhypate meson Trite diezeugmenon et Trite hyperboleon and these represent sounds which change according to the genus and contain larger or smaller intervals according to the division of the Tetrachords. There is another type of these, which are called diatonic.

[-f.12r-] The low thick ones are hypatehypaton, hypate meson, paramese, et nete diezeugmenon, and, finally, there are three which are not thick, namely the Proslambanomene, the mese and the last one. Thus, the low thick ones and not thick one belong to those sounds which are called stable, namely, which stay the same even if the genera vary. In the immutable system, according to the continuation of two tones, namely of the hypermyxolydian and of the hypodorian, these are seven, namely, proslamuanomene hypatehypaton hypate meson, mese paramese nete diezeugmenon et nete hyperholeon, but we will show this more clearly later on.

Now, on this matter, I say that the species of the diatessaron are three.

The first one is contained within the low thick sounds, as it is the one which the hypate of the hypate makes from the hypate of the medium ones.

The second one is contained within the middle thick ones, such as the one which the parhypate of the hypate makes with the parhypate of the middle ones.

The third one is contained under the high thick sounds, such as it is the one, which the index of the hypaton forms with the index of the middle ones.

However, one must be aware that in the Enharmonic and chromatic genus the forms of the consonant intervals are taken according to the ratio of the thick system, so it follows necessarily that two forms are created. In fact, the thick system either it leaves out two intervals of the diatessaron on the side of the lowest sound, or on the side of the highest sound. However, in the Diatonic genus the comparison is not made in the thick one, because this genus is divided into tones and semitones.

The species of the Diapente are four.

The first one is contained under the low thick ones, of which the first one is the tone in the high part, as it is the sound of the hypate from the mese to the paramese.

The second species is contained under the middle thick ones, whose second tone is in the high part.

The third one is contained under the high thick ones, whose third tone is in the high part.

The fourth one is contained under the thick low ones, whose fourth tone is in the high part, as it is from the mese to the nete of the disjointed ones.

Instead, in the Diatonic genus the first species of the diapente is the one where in the low register the semitone is placed in the first place, while the second one is the one whose fourth semitone is in the high part, while the third one is the one whose second semitone is in the high part and the fourth one is the one whose third semitone is in the low part.

The different types of the diapason are seven and they are differentiated by the number of the intervals which are uncompounded in it, or that are contained by sounds which are subordinate one to the other.

The first one is contained under the low thick ones, whose first tone is directed towards the high register and it moves from the hypate of the hypate to the paramese, and this was called Mixolydian by the ancients.

The second one is contained under the middle thick ones, and its second tone is turned towards the high register, as it is from the parhypate of the hypate to the third of the disjointed, and it is called Lydian.

The third one is contained under the high thick ones, and it has the third tone is in the high register, as it is from the parhypate of the hypate to the paranete of the disjointed, and it is called Phrygian.

The fourth is contained under the low thick ones, and its fourth tone occurs towards the high register, as it is the one from the hypate of the middle ones to the nete of the disjointed ones, and it is called hypodorian.

The fifth one is contained under the middle thick ones, and its fifth tone is turned towards the high register, as it is the one from the parhypate of the middle ones to the third of the highest ones, and it is called hypolydian.

The sixth one is contained under the middle thick ones, and its sixth tone is turned towards the high register, as it is the one from the lychane of the middle ones to the paranete of the of the highest ones, and it is called hypophrygian.

The seventh one is contained under the high thick ones, and its seventh tone is turned towards the high register, as it is the one from the mese to the nete of the of the highest ones, and it is called common Locrian and hypodorian.

In the diatonic genus the first variety of the diapason is the one whose first tone is located in the [-f.12v-] low part and the fourth one is in the high part, and this fourth one is the semitone.

The second one is the one in which the third tone is turned to the low register and the seventh to the high one.

The third one is the one in which the second moves from one side to the other one.

The fourth one is the one in which the first one is turned towards the low register and the third to the high one.

The fifth one is the one in which the fourth is turned towards the low register and the seventh to the high one.

The sixth one is the one in which the third one is turned towards the low register and the sixth one towards the high one.

The seventh is the one in which the second is placed in the low register and the fifth one in the high register.

These varieties are found to be occurring in the same sounds or notes which are in the other two genera, namely, the Enharmonic and the chromatic, and they are called with the same names and words. From what was said already one can understand the origin of those aforementioned tones, and this will be explained even more clearly later on and illustrated with examples, but now I will go on and explain the other varieties of the systems.

There is another variety of the systems and it is the fourth. This one originates from the difference in the intervals because, since some intervals are represented by numbers which are irregular or irrational, thus the systems which are composed by rational intervals are called rational, while the ones which are composed by irrational intervals will be called irrational.

The fifth difference within the systems is that some are composed and sung with adjacent sounds and others with sounds that are transcendent or not adjacent, as it was said. But, before we come to the sixth one, we must explain that the simple system are constituted only in one way, while the ones which are not simple are constituted by mixing several modes.

The sixth difference separates the systems composed of conjoined Tetrachords from those made by disjointed Tetrachords.

Two Tetrachords are conjoined when there is a sound which is in common between two adjacent Tetrachords, according to the illustration.

The disjunction occurs when there is a Tone interposed between two adjacent Tetrachords of the same system. I do not deny that one can find some common systems which sometimes are structured according to the disjunctions and sometime according to the conjunction. All the conjunctions in the immutable system are two, namely, the low one and the high one. The low one occurs in the Tetrachord of the hypate or of the middle ones, while the high one belongs to the Tetrachord of the disjointed one and of the highest ones. In the low conjunction the hypate of the middle ones is the term or sound in common of the conjunction, while in the high one this common sound is the nete of the disjunct ones.

On the other hand, the disjunction consists in a tone which lays between the mese and the Paramese.

Finally, the systems the variation of the mutable and immutable intervals renders the systems different, because some systems are simple and others are not, according to it. The simple ones are the ones which are disposed according to the half one, the double ones according to two, triple ones to three, and the multiple to several. The mese is a property of the sound according to which it occurs that it has an uncompounded tone towards the high part according to the disjunction, or that it does not refer to another position, and according to the conjunction of three conjoined Tetrachords, whether it is the higher note of the Tetrachord of the middle ones, or the lowest of the highest Tetrachord.

[7.in marg.] On the Mutation.

The mutation comes about by altering the system and the form of the note or moving the one which is similar to a dissimilar location.

The Mutation is said to be distinct into four categories, namely, either it exits a genus and enters another one, as when one moves from the Diatonic to the Chromatic or to the Enharmonic, and in this way it changes; or when it exits a system and enters into another, as it occurs when it moves from the disjointed to the conjoined and then it goes back; or when it exits a tone and enters another one, as from the Dorian to the Phrygian and conversely; or when it exits a type of intonation and enters another one, as if one moved from the serious to the mixed or to the soft one, which is what Pythagoras did in order [-f.13r-] to calm down a drunken and possessed young man. This mutation is made more easily according to that the Greeks call melopoeia, which belongs to the Tragedies, Comedies, Satiric theatrical compositions and others which display different characters and actions. These will be described in our discussion on Poetry.

However, do let us delve into the beautiful knowledge of the modes and the right division of each of them

[8. in marg.] The sounds within which each mode is contained.

Now, we will discuss the sounds, either vocal or instrumental, which contain the eight modes described above.

Therefore, one must be aware that each of the above mentioned tones has derives specific and contained space from the rising and lowering the voice and it is circumscribed within certain and particular terms, which come together in its division, because each of them can be ordered according to each genus. Besides this, each of the seven modes is organised into two conjoined tetrachords and with the space of a tone. Therefore the nete of each of them is specified by the adjective which indicates the mode, so it is called lydian nete, phrytian nete and dorian nete. Similarly, the hypate of the first one towards the high regiser, according to which the Tetrachords are joined together, is called the mese of the of the mode from which it is composed, but the one which is take from outside the system and it is at the distance of a tone with the hypate, is called Proslambanomene. Hence, since one of the eight tones is the lowest and one is the highest and many are in the middle between these two extremes, it is a necessary consoquence that the Proslambanomene of each of them is different for each of them, so that the first and lowest one among all the modes has the mese as its nete, the hypate of the middle ones as its mese, the hypate of the hypate as its hypate, the Proslambanomene of the perfect system in the place of its own Proslambanomene because each of the tones has a beginning, a middle and an end, and for this reason it can be called a species or a shape, because the perfection lays in the beginning, the middle and the conclusion. And what can be perfect if not the shape?

Now, not only one can sing in the high range, but also the middle and the low range in each of the tones. The aforementioned lowest tone is called hypodorian, which means below the Dorian, because the lowest Tetrachord of the Dorian mode is the highest of the said mode. It has the mese as its Nete and the hypate of the middle ones as its mese. In fact, we already said that each of the modes completes two Tetrachords and one of the Tetrachords is higher and the other one is lower.

The second mode has the paramese as its nete, the parhypate of the middle ones as its mese, the parhyate of the hypate as its hypate, the hpate of the hypate as its proslambanomene. This mode is called hypophrygian, namely, below the Phrygian, because the lowest Tetrachord of the Phrygian tone is the highest of that one, the mese

is its nete, the hypate is its mese. The sounds of this Tetrachord are shared by these two modes, namely the Phrygian and the hypophrygian, just as the Dorian and the hypodorian shared the sounds of their contained in their coomon Tetrachord.

The third tone or mode has as its nete the third of the disjointed, as its mese the index of the medium ones, as its first one the index of the first ones and as its added-on one the next one to the first of the first ones. This mode is called hypolydian because the lowest Tetrachord of the lydian is higher than the one which as the mese as the last one and the first as the mese, and both of said modes converge in the melodies according to this Tetrachord.

The fourth mode has as its last one the penultimate of the disjoined ones, the mese as its [-f.13v-] mese and the first of the middle ones as the first and the index of the first ones as the added-on one. This mode is called Dorian, from the people who invented it.

The next one after the Dorian is the Mixolydian, because the lowest Tetrachord of the mixolydian mode is the highest of the Dorian. It has the mese instead of the last one and the first one instead of the mese. Both the aforementioned modes converge in their melodies according to this Tetrachord.

The fifth mode has as its last one the last one of the disjointed ones, and as its mese the one near the mese and as the one near the mese the mese, and as its added-on one the first of the middle ones. It is called Phrygian from the people who discovered it.

The mode hypomixolydian follows after this one because the lowest Tetrachord of the del medio hypermizolydio è piu acuto di quello and it has the mese as the last note and the first as the mese. Both the aforementioned modes converge in their melodies according to this Tetrachord.

The sixth mode is the one which has the third of the highest and the third of the disjointed as middle ones and the index of the middle ones as the first and the one near to the first of the middle one as the added-on one, and it is called Lydian from its inventors and from the name by which it is has been known. As we said, it shares the lowest tetrachord with the hypolydian mode.

The seventh mode has as the penultimate of the highest ones as its last one, as its middle one the penultimate of the disjoined ones, as first one the mese and as the added-on one the index of the middle ones. This mode is called mixolydian from its proximity to the Lydian mode, because does not exceed it by the interval of a full tone, but by the remainder of the diatessaron which spans from the Dorian to the Lydian tone. Its lowest Tetrachord has the melody in common with the Dorian which we have described, according to what we said above.

The eighth mode as its last note the last of the highest, as its mese the last of the disjoined, as its first the one which is next to the mese and as its added-on one the mese. This mode is called hypermixolydian because it is located above the mixolydian and it has its lowest Tetrachord in common with the Phrygian mode.

So-far I have provided the name and the disposition of each of the eight modes. Moreover, I have described et di piu qual chorda delle 15 che sono nella perfetta ordinanza, which is the last one of each of the modes, which is the first one, which is the middle one and the added-on one. Now I will explain how each tone is higher or lower on the basis of its span and according to the quantity of their intervals, namely, whether they are consonant, dissonant, correspondent or exceeding in sound. But, since this explanation is not totally sufficient to clarify their musical nature, we shall put in front of your eyes the illustration and the description of the above mentioned matters, which will explain with clarity what we have said and then we shall continue with what follows in brief.

[-f.14r-] [Barbaro, On Music, 14r; text: L'ordinanza della Diapason, Dorio, hypodorio, hypophryigio, hypolydio. Phrygio. Lydio, Mixolydio, hypermixolydio, tuono, semitono, commune al, all', L'ultima del modo, La mezzana del, la prima, l'aggiunta, ultima, penultima, terza, eccellenti, disgiunte, mezzane, prime]

[-f.14v-] The lowest tone is the hypodorian, which is the first one. The highest one is the hypermixolydian, which is the eighth and it is removed from the hypodorian by the interval corresponding to the consonance of a diapason, since we have said that its added-on note is the last one of the hypodorian.

The second mode, called hypophrygian, is a tone higher than the hypodorian and lower than the hypolydian. Similarly, similmente per lo spacio medesimo dell'hypodorio per lo spacio di tre semituonj del phrygio [prhigio ante corr.], per lo spacio d'una diatessaron del lydio per lo spacio della diapente, del mixolydio per lo spacio di 4 tonj. dell'hypermixolydio per lo spacio di 4 tonj.

The third one called hypolydian is a ditone higher than the hypodorian, it is a tone lower than the hypophrygian, a semitone than the Dorian, a tone and a half than the Phrygian, a diatessaron than the Lydian, three tones than the mixolydian and four tones than the Hypermixolydian.

The fourth one called Dorian is a diatessaron higher than the hypodorian, three semitones than the hypophrigian, a semitone than the hypolydian, it is a tone lower than the Phrygian, two tones lower than the Lydian, a diatessaron than the myxolydian and a diapente than the hypermixolydian.

The fifth one, called Phrygian, is a diapente higher than the hypodorian, a diatessaron higher than the hypophrygian, three semitones than the hypolydian, a tone than the dorian, and a tone lower than the Lydian, three semitones than the myxolydian and a diatessaron than the hypermixolydian.

The sixth one, called Lydian, is four tones and a semitone higher than the hypodorian, it is a diapente higher than the hypophrygian, a diatessaron higher than the hypolydian, a tone than the Dorian, a tone lower than the Phrygian, half a tone lower than the mixolydian and three tones lower thant he hypermixolydian.

The seventh, called mixolydian, is five tones higher than the hypodorian, four tones than the hypophrigian, four tones than the hypolydian, a Diatessaron than the Dorian, three semitones than the Phrygian, a semitone than the Lydian, and it is a tone lower than the hypermixolydian. The eighth is called hypermixolydian and a Diapason higher than the hypodorian, five tones than the hypophrygian, four tones than the hypolydian, a Diapente than the Dorian, a diatessaron than the Phrygian, a semitone than the lydian and a tone than the mixolydian.

[-f.15r-] Since every harmony refers to the ear and every sentiment which is not practised under the supervision of reason is something irrational, therefore it is necessary that our ears should be led by reason. In this way, the astronomers proceeding according to reason adopt different tools to explain their beautiful theories on the movement of the skies and of the celestial bodies. Musicians do the same in their systems, and for this reason they have discovered a practical measurement which regulates all of the differences which occur among the sounds, which differences are also embodied by numerical ratios. This measurement is called Harmonic Rule and is made in the the way explained further on.

Take a flat surface and mark the points A. b. c. D. On this one draw a square

shape which will be longer than larger, so that it is 10 spans long and 5 spans wide. Call this shape .e. f. g. h. Divide the width e. f. into i4 equal parts forming 13. common terms, which you will mark i. k. l. m n o p q r s t u x. From these points draw their straight lines to the other end. I say that these lines, which are 15, correspond to the 15 notes of the perfect system which is called Immutable. Then, you will divide the left side which shows the length e. g. and corresponds to the added-on note, you will divide it, i say, into two equal parts, and each part into two parts. The other line of the length of the right side f. h. will correspond to one of these, and this one represents the last one of the highest. Similarly, you will draw the median line p. y. to one of the two parts p. e., which in this place corresponds to the median of the i5 and this is the proportion between the added-on one to the last one of the Highest ones. In this way we have derived three stable sounds from this rule, which contain two conjoined Octachords, of which one is low in pitch and the other high. These are two systems which each corresponds to the diapason and are contained by the added-on, by the mese and by the last note, or from the lowest and deepest sound, by the middle one and by the highest and most acute. Once we have done this, we will divide h u, the fourth line from the high part T. Z. Into three equal parts, and we will make T. Z. the fourth line equal to it and to its third part so that it responds to the last one of the disjointed ones and it turns out to be in sesquiterza proportion to that one, as the last one of the disjointed ones must be to the last one of the highest ones. Besides this, the line T. Z. will be have to be divided into three equal parts and the q will be made equal to that one and to the third part, so that it responds to the nearest of the middle ones and it is in the same proportion with the nearest of the middle ones to the last one of the disjointed ones, namely the sesquiterza proportion. Thus we shall have the four stable notes of the ancient lyre of the octochords towards the high register, which consists in the system which corresponds to the Diapason towards the high register and which belongs to the hypermixolydian mode. These sounds are those of the nearest to the middle one, of the middle one, of the last one of the highest and of the last one of the disjointed ones. Once you have done this, you will also divide the line p. y. (which corresponds to the mese) into three parts which are equal to this one. You will make the m. x. Equal to the third part of it, so that this responds to the first of the middle one and it is in sesquialtera proportion to that one, which is the same proportion that the first of the middle ones has to the mese. Similarly, you will divide the line p. y. into three parts, and you will draw the lime i. a. equal to them with a third added to it, so that this one corresponds to the first of the first ones and it is with it in sesquiterza proportion, which is the same proportion that the first of the first ones has to the first of the middle ones. In this way you will have create the four stable sounds of the lowest Octachord according to the ancient style, which contain a correspondence of the diapason in the lowest system, which is in the hypodorian mode. These are the mese, the first of the middle ones, the first of the first ones and the added-on one.

Besides all this, one must know that, of the stable sounds described above, the three that are in the highest system and correspond to the diapason not only embrace all of the genera of the melody typical of the hypomixolydian mode, but also those which are not so commonly used. The three sounds are the last of the highest one, the last of the disjointed ones and the near to the mese. Moreover, even the three which give the diapason to the lowest system, as the mese is the first of the middle ones, not only they embrace all the most common genera of the melody of the hypodorian mode, but also the ones which are not so commonly used, as we shall say later.

Now we shall talk about the Hypermixolydian mode after introducing the

illustrated description of the harmonic rule explained above.

[-f.15v-] [Barbaro, On Music, 15v; text: Regola harmonica, a, b, c, d, e, f, g, h, i, k, l, m, n, o, p, q, r, s, t, u, x, y, l'ordinanza piu graue. Che risponde la diapason. il Tetrachordo, la prima, mezzana, l'ultima, A. X, Y, N, [omega], [xi], suono stabile. L'aggiunta. disgiunte, eccellenti]

[-f.16r-] [Barbaro, On Music, 16r, 1; text: sesquiterza. Il piu acuto Tetrachordo del tuono hypermixolydio, 1 i/ij, 1 1/10, 1 1/9. l'ultima, penultima o indice, proxima alla prima, Eccellenti, 12, ij, 10, 9. genere diatonico temperato.]

Since the genus is nothing that but a certain division of the Tetrachord or a system of three intervals con with a certain disposition and internal relationship, where the extreme sounds considered according to their nature are in sesquiterza proportion, and since in each division of the Tetrachords the highest note is always called the last one and the lowest the first, and, of the ones which are above it the lowest, nearest to the first one, and the highest are called penultimate, and since, finally, the first and the last one in every mutation of genus or species are always stable and fixed, while the other two are mobile and changeable, it is necessary to explain the locations, the ratios and the proportion of the melodies and transpositions, so that, from a number naturally almost infinite, those proportions may be extracted, albeit few out of such a large number, which appear to be suitable to the creation of the melody. Therefore, we shall start from the large and intense hypermixolydian mode, which is the highest and most acute of them all, and also because the penultimate note which is also called index of the diatonic tempered genus is in unison with the penultimate of the most intense genus itself, and they are both higher and more tensed than the penultimate ones or indexes of the other genera, because they are less far removed from they own last notes than those from theirs, for this reason firstly we shall place the division of one and of the other species in the hypermixolydian mode.

Therefore, the last note of the octachord tuned according to the hypermixolydian mode in the tempered diatonic genus is the last one of the highest ones, as we have said, and the mese is the last one of the disjointed ones, just as the first one is the near to the mese and the added-on one is the mese. Now, to create from these the first and highest Tetrachord, let us take the rule, let us divide the last ones in nine equal parts and let us make the index or penultimate, which we have mentioned, equal to it and to the ninth part, so that, between the last one and the penultimate there is the sesquinona ratio. Then, let us divide the penultimate into ten parts, and we make the next to the first one equal to them augmented by an extra part, while the sesquidecima proportion will fall between the penultimate and the next to the first one. Once we have done this, we subtract the two above mentioned proportions, namely, the sesquinona and the sesquidecima from the sesquiterza proportion which is found between the first and the last one. We will acknowledge that the remainder of this subtraction, which is expressed by the sesquidecima proportion, will be the ratio from the first one to the next to the first one. The numerical proportion consists of these numbers 12, ij, I0, 9, and this is the division of the higherst Tetrachord of the hypermixolydian mode in the tempered diatonic species.

In the same way we shall divide the lowest Tetrachord of the hypermixolydian

tone, which is contained in the perfect disposition by the last one of the disjointed ones and by the near to the mese. The last one of these is in sesquinona proportion with the penultimate, the next to the first one is in sesquidecima proportion with the penultimate, and the first and the last one are in sesquiterza proportion, as it is necessary that it should be always. If we subtract a sesquinona and a sesquidecima from the sesquiterza, what is left is a sesquiundecima, as above.

The numbers are 24, 22, 20, i8. The remainder can be uderstood through the illustration, which will be constructed as the previous one. However, we will express here only the beginning of it, because one can easily understand the remainder from it. The names of the notes to which those of the perfect system correspond are written in small writing, while its three specific notes of the divided tetrachord are written in large characters. The differences, namely, the parts which are left over in the proportions are written in small writing, and thus one can understand the entire illustration drawn here below. [the following illustration, as all the others, can be based on the previous one and in a better way, but one should not spend time on it more in one way than in another one. in marg.]

[Barbaro, On Music, 16r, 2; text: il primo tetrachordo del modo hypermixolydio, in sesquiterza proportione, Diatonico temperato, l'ultima delle disgiunte, penultima indice. proxima alla prima, mezzana, 1 1/11, 1 1/10, 1 1/9, 2, 24, 22. 20, 18]

So-far we have dealt exhaustively with the highest and the lowest Tetrachord of the diatonic tempered genus according to the hypermixolydian mode. Now we shall deal with two other Tetrachords of the same mode in the most intense and tense diatonic genus, one of which is the highest and the other one is the lowest. In their discussion, I will explain how the added-on is found, because that one is always in sesquiottava proportion with the first one, or it is a tone removed from it, while, by dividing the first one into eight parts and adding the ratio of 1/8, we shall find the proportion of [-f.16v-] said interval. Now, you shall divide it into nine parts. The penultimate is 10, and the next to the first one is in sesquiottava proportion to the penultimate. I subtract the sesquinona and the sesquiottava from the sesquiterza. The result will be the sesquidecimaquarta between the first one and the next to the first one. If you want the numbers of this operation, here they are 96, 90, 80, 72. You will use a similar method in the lowest Tetrachord of the aforesaid mode and of the aforesaid species, and you will find the same results, which consist in the following numbers: 192, 180, 160, 144. From here you will find the above mentioned proportions sesquidecimaquinta, sesquinona and sesquiterza.

[Barbaro, On Music, 16v; text: tetrachordo del modo hypermixolydio in sesquiterza proportione, Diatonico intento. L'ultima dell'Eccellenti, penultima ouero indice. prossima alla prima. 1 1/15, 1 1/8, 1 1/9, 6, 10, 8, 96. 90. 80. 72. disgiunte, Terza, mezzana, proxima, 12, 20, 16. 192, 180. 160, 144.]

One might wonder why it happens that every system which produces the Diatessaron is contained within three intervals suited to the melody, namely, in the largest, in the larger and in the smaller, and why, since the largest must occupy the first place, the latter the middle one, and the smallest the last one, it happens that the

larger space acquires the larger intervals obtains the first place and the largest the middle one.

I reply. Since our ear is the one which decides absolutely which interval after which compounded one creates the system which produces the melody and which does not, wherever it can discern clearly the distance of the largest interval and of the larger, there it establishes and rules as by law and it decrees that the largest interval in the system of the diatessaron must occupy the principal and preceding place, and where, in short, the ear cannot achieve this, there it follows that the first place is ascribed indifferently no less to the largest than to the larger, and, since the interval by which the sesquiottava exceeds the sesquinona (where such intervals are located) is completely unnoticed by the ear, for this reason, as we shall say further on, the larger interval occupies the first place and the largest the middle one, since the measure by which i 1/8 exceeds 1 1/9 is in sesquiventottesima proportion, and such small difference in sound cannot be perceived by the ear. Hence, this is the answer to the proposed question.

There is also another reason, which is this one, namely, because the sesquiottava and the sequinona (wherever these intervals occur, namely in the intense and tense diatonic genus) are almost equal and equivalent, and the ear cannot grasp the difference of intervals which are so similar, and, therefore, it does not mind which interval comes first.   But, since the next to the first of the Diatonic tempered genus is more intense and strong than the next tot the first of the Diatonic intense genus, because the former is in sesquidecima proportion and the latter in sesquiottava proportion, and, when two terms are compared to a common term, the smaller is of more tense and strong interval than the larger, as one can see clearly in the instruments, therefore we shall say in which proportion their remainder must be considered. As to this,

[-f.17r-] [Barbaro, On Music, 17r, 1; text: multiplicate, prodotto, 8. 10, 80, raccoglimenti, 88, 90, eccesso, 2, tetrachordo commune al temperato, et intento genere diatonico, 6, 10, 8, 76, 90, 80, 1 1/15, 1 1/8, 1 1/9, 1 1/ij, 1 1/5, 1 1/10, 1 1/3, l'ultimo, indice, proxima alla prima]

it is necessary to apply a universal rule, on which basis we shall be able to find the differences between different proportions and the proportions of those differences according what their nature implies. Therefore, if our intention is two know the difference between the two proposed proportion, namely, the sesquidecima and the sesquiottava, which represent, one the next ones to the first one in the Diatonic intense genus, and the other one in the diatonic tempered genus, and also to know the proportion of that difference, first of all we take the two denominators of said proportions, namely 9 and i0. We multiply 8 by i0 and we make a note of the product, which is 80. Then, we take the eighth and tenth part of this, namely 8 and i0, as we write them separately. Then, we add the tenth part of 80 to 80 itself, and the sum will be 88, and, equally, we add to its eighth part, which will give 90. Then, we consider how 90 is larger than 88, and, having discovered that the difference is the number 2, we will understand that the difference between the larger proportion, namely, the sesquiottava, on the sesquidecima consists in the above mentioned numbers, and arrived diligently to this conclusion we will look at this difference which is 2 and we will considered which part it is of the 88. Having discovered that the number 2 is the forty-fourth part of it, once we have subtracted to it the proposed proportion, namely,

1/44, we shall know clearly that that is the proportion representing the difference of the sesquiottava above the sesquidecima proportion. Thus, from this example one can extract the general rule applicable when one wants to know the differences between proportions. Namely, after having multiplied one by the other one and having added first one and then the other one to the product, one will produce two sums in which one will know how one exceeds the other one. That will be the amount by which one proportion exceeds the other one, and by subtracting the discovered difference from the smaller sum, we shall find the proportion of the differences.

[9. in marg.] Division of the soft and intense genus in the hypermixolydian mode.

We shall divide the last one into 8 equal parts. The index will have 9 of these and it will be in sesquisettima proportion to the nearest to the first, just as it is in sesquiottava proportion to the last one. By subtracting the aforesaid proportions, namely the sesquiottava and the sesquisettima, from the sesquiterza proportion, which is the proportion of the last one with the first one, what we said can be understood through the numbers marked below. Here we have the highest Tetrachord of the hypermixolydian mode in the soft and intense genus, and the lowest one will be know through the same numbers.

[Barbaro, On Music, 17r, 2; text:tetrachordo acuto del modo hypermixolydio, in sesquiterza proportione, molle intento. 1 1/27, 1 1/7, 1 1/8. l'ultima delle eccellenti, indice, Penultima, proxima alla prima, terza, Ultima, disgiunte, 8, 27. 21, 224, 2i6. 189. 168. graue, mezzana, i6, 94, 42.]

[-f.17v-] Now it is necessary to consider in what was said how the index of the tempered diatonic is more intense that the indext of the soft by the sesquiventottesima proportion, because the former is in sesquinona proportion, while this on is in sesquiottava proportion, and, as we have said, a sesquiottava is larger than a sesquinona by the proportion 1 1/28. Similarly, the near to the first one of the diatonic tempered is higher than the near to the first one of the soft intense almosy by a sesquiventisettesima proportion, because that one is in sesquidecima proportion to its index, and this one in sesquisettima proportion. However, the sesquisettima, which has the next to the first one of the soft intense genus to its index, and the sesquiottava, which has it index to the last one, if they are added together produce a larger distance than the one produce by the sesquidecima, which has the next to the first of the Diatonic tempered genus to tis index, and the sesquinona, which has the said index to its last one, if they are added together. In fact, one considers the distance of the interval contained between the sesquisettima and sesquiottava by which the interval contained by the sesquidecima and the sesquinona is exceeded, which is almost in sesquinona proportion.

Similarly, the index of the intense and strong Diatonic is higher than the index of the soft. I mean that it is higher by sesquiventottesima proportion, and this can be seen from the proportion and illustrations according to the aforesaid rule.

Similarly, the next to the first one of the intense Diatonic is higher than the near the first one of the soft intense of almost sesquitrentacinquesima proportion. Here we shall produce the comparison of the two conjunct intervals in each genus between the next to the first one and the index and the last one, as we have done above considering the differences of two conjunct intervals

[Barbaro, On Music, 17v, 1; text: Tetrachordo commune al molle intento et al concitato genere diatonico. 336. i344, 1286. 1174, 1 1/27, 1 1/8, 1 1/11, i 1/35, 1 1/15,

36. 14, 1 1/8, 1 1/9, 84, 140, i12, i 1/39, 64, 1232, 1 1/10, ultima indice proxima alla prima. 1008]

[10 in marg.] Division of the soft diatonic.

      Now, we will divide the soft Tetrachord of the diatonic genus, which is the last one of all of the ones of this genus. So, the division of the highest Tetrachord in the hypermixolydian mode of the diatonic genus is this one, namely, as the penultimate and the last one are in sesquisettima proportion and the next to the first one and the penultimate in sesquinona proportion, if we subtract these two proportions from the sesquiterza, which is between the first one and the next to the first one, the numbers are 84, 72, 63. I would use the same method in dividing the lowest Tetrachord of this mode and of this genus, whose numbers are i64. i60. i44. i26.

[Barbaro, On Music, 17v, 2; text: tetrachordo piu acuto del modo hypermixolydio in sesquiterza proportione. 1 1/20, 1 1/9, i 1/7, 4, 8, 9, 84, 80, 72, 63, l'ultima delle disgiunte, l'indice Penultima, proxima alla prima, Terza, mezzana, eccellenti, 8, 16, 18. 164, 160, 144, 126.]

      [-f.18r-] Nevertheless, going back to the comparisons, one can see that the index of the temperate Diatonic is higher and intense than the index of the soft according to the sesquitrentacinquesima proportion. Also, the near to the first one is higher in the Diatonic than the one of the soft, by almost the sesquiventiseiesima proportion. You will make the comparison as above in the conjunct intervals from the near to the first one of the index and of the last one of one and the other genus.

      Similarly, the index of the intense Diatonic is higher than the index of the soft one in sesquitrentacinquesima proportion, and thus its next to the first one is higher than the next to the first one of the soft according to the sesquiventitreesima proportion. Compare as above.

      In short, the index of the soft intense is higher than the index of the soft by the sesquisessantatreesima proportion and the near to the first one is lower than the other one next to the first one according to the sesquiottava proportion. You will compare the conjunct intervals.

[Barbaro, On Music, 18r, 1; text: tetrachordo commune al molle et all'incitato genere diatonico, 21, 4, 8, 9, 16, 32, 36, 24, 8i, 102, 64: 1 1/20, 80: i 1/9, 102: 1 1/7. 1 1/27. 672, 648. 576. 1 1/26. 1 1/37. 1 1/63 1 .1/34, 1 1/8, 1 1/20, 107. 100 1 1/15. 640. 567. 504. 7. 21, 35, 28, 32, 64, 63, l'ultima, la penultima, proxima alla prima]

Division of the Chromatic intense and soft genus.
[11 in marg.]
      So-far, we have delt with all the colours of the diatonic genus in the highest mode called hypermixolydian. Now, we shall come to the division of the same mode according to the forms of the Chromatic genus. First we shall talk of the more intense form of this genus and then of the softer. Therefore, we shall divide the highest Tetrachord of this form in this way. The last one will be divided into six parts and the penultimate will be in sesquisesta proportion with it. The next to the first one will be in sesquidecima proportion to the penultimate. We shall subtract these two

proportions from the sesquinona, which exists between the first and the last one, and the remainder will be in sesquiventunesima proportion, which is between its first and last one. The numbers are 88, 84, 77, 6.
Similarly, the lowest Tetrachord has its division in the same proportions, and its numbers are 176, 168, 154, 132.

[Barbaro, On Music, 18r, 2; text: proportione sesquiterza, 22, tetrachordo piu acuto del modo hypermixolydio, Chromatico piu intento graue. 1 1/21, 1 1/11, 1 1/8, l'ultima delle disgiunte, Penultima, l'indice, proxima alla prima, Terza, mezzana, eccellenti, 4, 7, ij, 8, 4, 22, 88. 84, 77. 66. 176, 168. 154, 132.]

[-f.18v-] [Barbaro, On Music, 18v; text: Tetrachordo commune al Chromatico intento, et al Diatonico temperato, acuto, hypermixolydio, graue, in proportion sesquiterza, genere molle, 82. 12. 23. 36. 1 1/21, 1 1/ii, 1 1/6. 1 1/24 21. 1 1/20. 24. ultima, indice, proxima alla prima, prima. 13. 23. 36. 288. 275. 252. 1 1/21, 1 1/6. 1 1/54, 1 1/20, 270, 240, 2i6, 1 1/15, 1 1/18. 1 1/9. 18. 30. 24, 1 1/27, 1 1/14. 1 1/5, eccellenti, Terza, disgiunte, i0, 18, 42. 280. 252. 2i0. 20, 36, 62, 240. 560. 540. 504, 420, 176. 85. 88. 604. 679. 616, 1 1/7, 1 1/90,, 22, 1 1/21, 672. 616. 528, 56. 68, 1 1/8, 462 84, 147. 23i, 1848, 1764, 1617. 40760. 40386. 1 1/48, 1584, 176, 198.]

From what was said above, one can make the same comparison and note that the index of the tempered Diatonic is higher than the index of the intense chromatic of sesquiventesima proportion because that one is in sesquinona proportion, while this one is sesquisesta proportion, and the sesquisesta is larger than the sesquinona by a sesquiventesima. Similarly the next to the first one of that genus is higher than the next to the first one of this one by a sesquiventiquattresima proportion because that one is in sesquidecima proportion to its xindez and this one is in sesquiundecima proportion to its own, but a sesquiundecima and a sesquisesta, which are the proportions of the intense Chromatic genus between the next to the first one and the index and between the index and the last one added together, are at a greater distance than the sesquidecima and the sesquinona which belong to the tempered Diatonic genus between the next to the first one and the first one and between the index and the last one. Also, one notes that the distance of those two intervals added together, by which one exceeds the other, is in sesquiventiquattresima proportion.

The index of the intense Diatonic is also higher than the index of the Chromatic by a sesquidecima, as the next to the first one of that one is higher than the next to the first one of this one by a sesquicinquattresima. This can be evinced by making the same comparison as above between the conjunct intervals of one and the conjunct intervals of the other.

The index of the intense soft is also higher than the index of the intense Chromatic by the sesquiventisettesima proportion because the former is in 1 1/8 proportion and the latter in 1 1/6 proportion, which is greater, but the next to the first one of that genus is lower than the next to the first one of this one by a sesquinovantaseiesima. Make the comparison between the conjunct intervals and you will find that the thesis I propose is completely true.

Finally, the index of the soft diatonic is higher than the index of the intense Chromatic by a 1/quarantottesima, and the near to the first of the soft diatonic genus is higher than the near to the first of the intense Chromatic genus is higher by a

1/quattrocentoquarantesima. As for the rest, the same is done by comparing the conjunct intervals of one to the conjunct intervals of the other
Division of the Chromatic genus.

Since the index is in sesquiquinta proportion with the last one and the next to the first one is in sesquiquarta proportion with the index, if we subtract these two proportions from the sesquiterza, what is left is the sesquiventisettesima. This is how the highest Tetrachord of the hypermixolydian mode in the so-called soft Chromatic genus will be. Its numbers are 280. 20. 252. 2i0. One adopts a similar method in dividing the lowest of said mode in said form of said genus, and its numbers are 560. 540. 504 420.

[-f.19r-] [Barbaro, On Music, 19r; text: Tetrachordo commune al molle Chromatico et al Diatonico Temperato, intento. 45, 8i. I89. 1260. 1215. 1134, 1 1/27, 1 1/14, 1 1/5. ultima, indice, penultima. Prima. 84, 60. i 1/15, 1 i/19, 1 1/14 [1/17 ante corr.], i05, 1855, 1050, 945, 1 1/0, 1 1/9, 140, 17.35. 22, 480, 432, 1 1/27, 1 i 13, 1 1/35, 32, 1 1/35, 1 1/8, 1 1/15, 1 1/12, 30, 40, 50, 450,560, 80, 144, 836. 2240, 2160, 20i6, 196, 1 1/11. 18, 1 1/7, 1 1/6, 186, 1 1/11. 270, 2i0 [alpha], [chi], [ypsilon], [pi], 15, 27, 63, 420, 406, 378, 1 1/64, 1 1/26, 1 1/28, 1 1/21, 20, 40, 45. 440. 692. 1448 [beta], [tau], [kappa], [omega], [psi], 1 1/14, 1 1/38. 1 1/36. 120. 308. 560, 980, 1540.]

The index of the diatonic genus is higher than the index of the soft Chromatic by almost a sesquidecimaterza, because that one is in sesquinona proportion while this one is in sesquiquinta, which is almost larger by a sesquidecimaterza. The next to the first one of the genus is also higher than the next to the first one of this one, almost by a sesquidiciannovesima. Hence, that one is in sesquidecima proportion to the index, while this one to its index is in sesquidecimaquarta proportion, while, since this proportion occupies a larger distance with the sesquiquinta which the index of this genus has with its last one than the sesquidecima of that genus with its sesquinona, it creates a larger proportion because one notes the difference of the intervals conjunct one to the other according to the sesquinona proportion.

Similarly, the index of the intense Diatonic genus is higher than the index of the soft chormatic genus by a sesquidecimaterza and, similarly, the near to the first one of this genus is higher than the near to the first one of this genus of almost a sesquitrentacinquesima, because that one of that genus is in sesquiottava proportion to its index and this one is in sesquidecimaquarta to its own. Therefore, if one adds together a sesquidecimaquarta which is between the next to the first one and the index and the sesquiquinta which the index has to the last of the Chromatic genus, represent a greater interval that the sesquiottava and the sesquinona which occur in the intense Diatonic between the next to the first one and the index and between the index and the last one of that genus added together. The difference by which the interval contained by the sesquidecimaquarta and the sesquiquinta added together exceeds the sesquiottava and the sesquinona is considered represented almost by the sesquitrentacinquesima proportion.

Also, the index of the intense soft is more tense than the index o the soft Chromatic by a sesquidecimaquinta, just as the next to the first one of that genus and the next to the first one of this one are one and the same because they are both in unison.
Instead the index of the soft Diatonic is higher than the index of the soft Chromatic by a sesquiventesima because that one is in sesquiottava proportion and this one in

sesquiquinta, which is greater. The next to the first one of that genus is higher than the next to the first one of this one in sesquiottava proportion. You can make the comparison between the conjunct intervals of one and the other as before.

To sum up, the index of the Chromatic intense genus is higher than the index of the same genus, but soft, by a sesquitrentacinquesima because that one is in sesquisesta proportion, while this one is in sesquiquinta, which is greater. Similarly, the next to the first one of the intense is higher than the next to the first one of the soft Chromatic by a sesquinovantottesima, because that one is in sesquiundecima proportion to its index, and this one is in sesquidecimaquarta. This can be gathered, by comparing the conjoint intervals, as above.

[-f.19v-] [12 in marg.] Division of the Enharmonic genus.

[Barbaro, On Music, 19v; text: Tetrachordo piu acuto del modo hypermixolydio, graue, commune all'Encharmonico, et all'incitato genere Diatonico, molle intento, Chromatico, insesquiterza proportione. Ultima delle eccellenti, indice, Penultima, proxima alla prima, terza, disgiunte, mezzane, 92, 1 1/45. 1 1/23, 1 ¼. 8, 15, 69, 368. 360, 345. 276, 184, 1 1/45. 1 1/23. 1 ¼. I6, 39, i36. 736. 720, 690, 552. 276, 23, 45, 207, 1104, 1080, 1135., 1 1/8, 1 1/i5. 229. 215, 68. 40012, 215, 229. 1 1/11, 92, 1 1/i0, 1 1/9, [[1937]], 10104, 1035, 1 1/27, 115, 45. [[2034]], 448. 39, 73. 336. 1 1/69, 25, 1828. 213 [113 ante corr.], 64, 1512, 168. 1344, 1932, 7828, 7560, 7245. 1 1/43, 1 1/38, 721, 200, 1 1/20, 7360. 6624. 5796. 272, 736, 828. 2024. 172. 330. i5i8, 1 1/14, 1 1/40, 506. 192, 1 1/21, 7728, 7084, 368, 644, 1012, 6072. 9660, 840. 1575. 7245. 8640, 7800. 6225. 1 1/45, 1 1/24, 1 1/70. 1449. 540, 7260, 1380, 2482, 5196]

When you want to divide the Enharmonic genus in the hypermixolydian mode according to the highest tetrachord, take its last one, which is the last of the highest, and you will dispose its index in sesquiquarta proportion, while you will place the next to the first one in sesquiventiquattresima proportion to the index, which corresponds to the penultimate of the highest ones. If you subtract these two proportions from a sesquiterza what will be left is a sesquiquarta which is the proportion of the first one which corresponds to the third one of the Highest in the perfect system. The numbers are 368, 360, 345, 276.

We shall also divide the lowest Tetrachord of this genus according to the hypermixolydian mode with the same method. The numbers are 736, 720, 696, 452. One must know that the index of the tempered Diatonic is higher than the index of the Enharmonic by a sesquiottava, and the next to the first one of that one is higher than the next to the first one of this one almost by a sesquidecimquinta. Make the comparison, and you will see it, as above.

The index of the intense diatonic is higher than the index of the Enharmonic by a sesquinona, and the last one of that one is higher than the penultimate of this one by almost a sesquisessantanovesima.

The index of the soft Diatonic is higher than the index of the Enharmonic by almost a sesquitrentottesima.

The index of the intense Chromatic is higher than the index of the Enharmonic by a sesquiventiquattresima, while the next to the first one of that one is higher than the next to the first one of this one by a sesquisettantasettesima. You will compare the conjunct intervals in this way, from the next to the first one to the index and from the index to the last one, as above.

[-f.20r-] [12 in marg.] Division of the Diatonic genus

[Barbaro, On Music, 20r; text: il piu acuto Tetrachordo del modo hypermissolidio in proportione sesqualtera genere Diatonico. graue, sesquiterza, commune, Diatonico, intento, molle, temperato. Chromatico, Encharmonico, 64, 27. limma. 1 1/8, 13, 27. 24, Ultima delle eccellenti, Penultima, proxima alla prima, [[265]] 256. 245. 2i6. 112, 128, 23. 54, 48., 512, 486. 432, 384. 192, 39. 41, 72, 768. 729, 648. 1 1/5, 1 1/28. 8. 9. 1 1/15. 720, 740, 572, 2688. 1 1/27, 1 1./7, 1 1/15. 1 1/63/ 162, 546, 1206, 9[[.]]72. 864. 1135. 2240, 1344, 1 1/20, 1 1/9, 1 1/7. 1/60, 72, 1 1/30, i7, 355. 5103. 4536, 4032, 567, 504, 1 1/8, 704, i28, 224, 352, 2916, 2748. 2464, 1 1/21, 1 1/ij, 1 1/6, 1 1/178. 1 1/27. 2673. 2372, 2116. 143, 297. 264. 340. 576. 1344. 8960. 8640. 864. 1 1/22. 1 1/14, 1 1/15, 504. 1 1/60, 135. 1 1/8. 1/8, 6720, 453. 844, 552, 1472, 128, 240, 1164, 5888. 5760, 5520, 1 1/45. 1 1/23. 1 ¼. 1 1/30, 4416, 299, 621, 552]

After we have divided and distributed the Enharmonic genus, we shall come to divide the Diatonic according to its last form which is called Diatonic, which means that procedes by tones or is richer in tones, as we have said. This form is very natural, commonly adopted, usual and well known among all the other types of harmony. The highest tetrachord of this form according to the hypermixolydian mode is divided in this way. The index with the last one and the next to the first one to the index are in sesquiottava proportion. These two sesquiottave subtracted from the sesquiterza, which is between the first and the last one, leave a smaller semitone, which is called limma by the writers of theory, because it is what is left once two tones are subtracted from a sesquiterza. This one is in none of the aforesaid proportion, either of the ones suited to the melody or of the ones which are not suited to it. These are the numbers i3. 27. 24.
The lowest tetrachord of that mode and of this form will be divided in the same way. Its numbers are 23, 54, 42.
Let us move on to compare them with each other. The index of the tempered Diatonic is higher than the index of this one by a sesquiottantesima. The index of the intense Diatonic is higher by the same amount, while the index of the soft intense is in unison. The index of the soft diatonic is lower by a sesquisessantatreesima, the index of the intense Chromatic is lower than that by a sesquiventisettesima and the index of the soft Chromatic is lower by a sesquidecimaquinta. To sum up, the index of the Enharmonic is a sesquinona lower than that one. In this way one can also compare the next to the first on e of the other genera and modes to the next to the first one of this one, because the one of the tempered diatonic is higher by a sesqui28, and the one of the intense diatonic by the same measure, the one of the soft intense is almost a sesquitrecentosessantatreesima lower than that one, while the one of the soft diatonic is almost a trecentesima lower and the one of the intense Chromatic is almost a sesquiccentosettatottesima lower than that one, the one of the soft Chromatic a sesquisessantatreesima lower, and finally the one of the Enharmonic is almost a sesquitretatreesima lower than that one, as one can gather by comparing the intervals.