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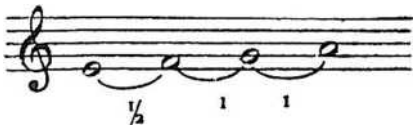
INTRODUCTION by L.-A. Bourgault-Ducoudray

[Please note that this is a draft translation]

ON THE FORMATION OF DIATONIC SCALES

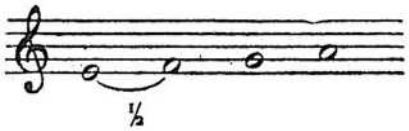
In order to understand the formation of the twelve diatonic scales, we first have to define the composition of the fourth.

A perfect fourth [Note 1] is made up of two tones and a half tone. For example:

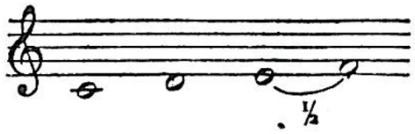


The half tone can occupy three different positions in the fourth.

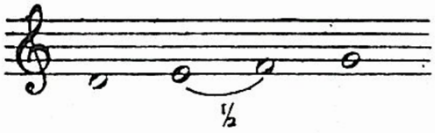
It can be at the beginning; this will be the first kind of fourth:



It can be at the end; this will be the second kind of fourth:



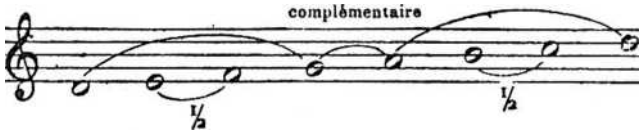
It can be in the middle; this will be the third kind of fourth:



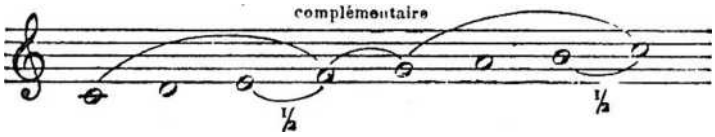
Any diatonic scale consists of two perfect fourths, plus one extra tone.

With two fourths of the first kind, separated by a complementary tone, we form this first octave:

With two fourths of the third kind, separated by a complementary tone, we form this second octave:



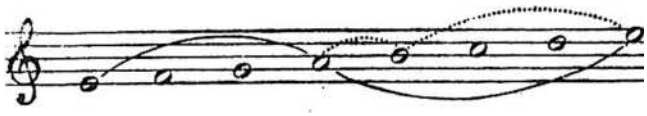
With two fourths of the second kind, separated by a complementary tone, we form this third octave:



These three octaves, based on the three different forms of fourth, can be called generator octaves, because the elements that compose them serve to form all other scales.

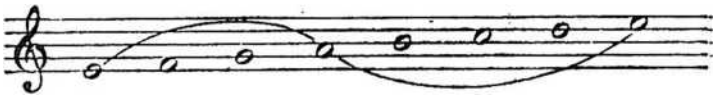
In each of the three generating octaves we find two fourths of the same kind separated by a complementary tone. Depending on whether the complementary tone is associated with the fourth placed in the lower part of the octave or with that placed in the upper part of the octave, the latter is divided into a fifth and a fourth, or a fourth and a fifth; we have in the first case:

In the second, we will have:



Let us consider the three generating octaves as divided into a fourth and a fifth; this gives us the following scales:

1.

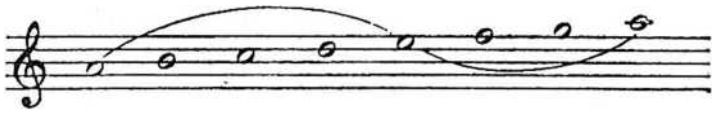


2.

3.

If we now reverse the order of the fourth and the fifth in each of these scales, that gives us three new scales:

1a



1b

1c

This already gives us six scales, of which the first three (the generating octaves) are divided into a fourth and a fifth, and the other three (the generated scales) are divided into a fifth and a fourth.

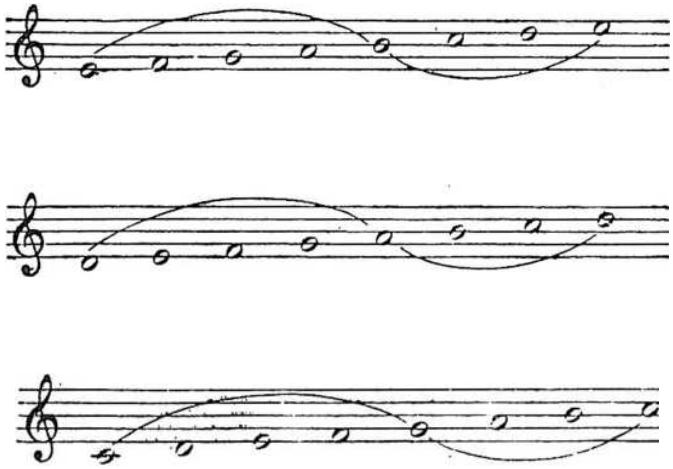
In scale no. 1 (the first generating octave) and in scale no. 1a (first generated scale), the E and the A keep their respective character; in both scales, E plays the role of dominant, and A that of the tonic.

It is the same for D and G in scales 2 and 2a , for C and F in scales 3 and 3a, In both instances the F and G are tonics, and D and C are dominants.

We can therefore formulate the following principle: the scales which have the fourth at the base of the octave begin with a dominant, and those which have the fifth at the base of the octave begin with a tonic.

If we now consider the three generating octaves as divided into fifths and fourths instead of being divided into fourths and fifths, we will have three scales similar to the first three as regards the composition of the intervals, but differing in the cut of the octave. These three

new scales, which have at the base of the octave no longer the fourth, but the fifth, no longer begin with a dominant, but with a tonic:



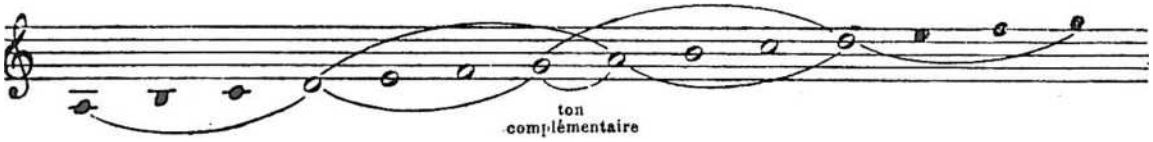
These three scales will in turn generate three other scales which will be obtained by reversing the order of the fifth and the fourth. The three scales thus obtained will have the fourth at their base; they will start with the dominants of their respective generators.

As can be seen, the second division of the three generating octaves into fifth and fourth provides a further six scales, which, together with the first six, give a total of twelve scales.

That concludes the series of diatonic scales. There can only be twelve diatonic scales, because there are only three kinds of fourth; they give birth to three generator octaves, and with each of these three octaves, one can only train four scales. This is what we have sought to illustrate in the figures below:

(1) SCALES GENERATED BY THE GENERATOR OCTAVE BASED ON THE FIRST KIND OF FOURTH

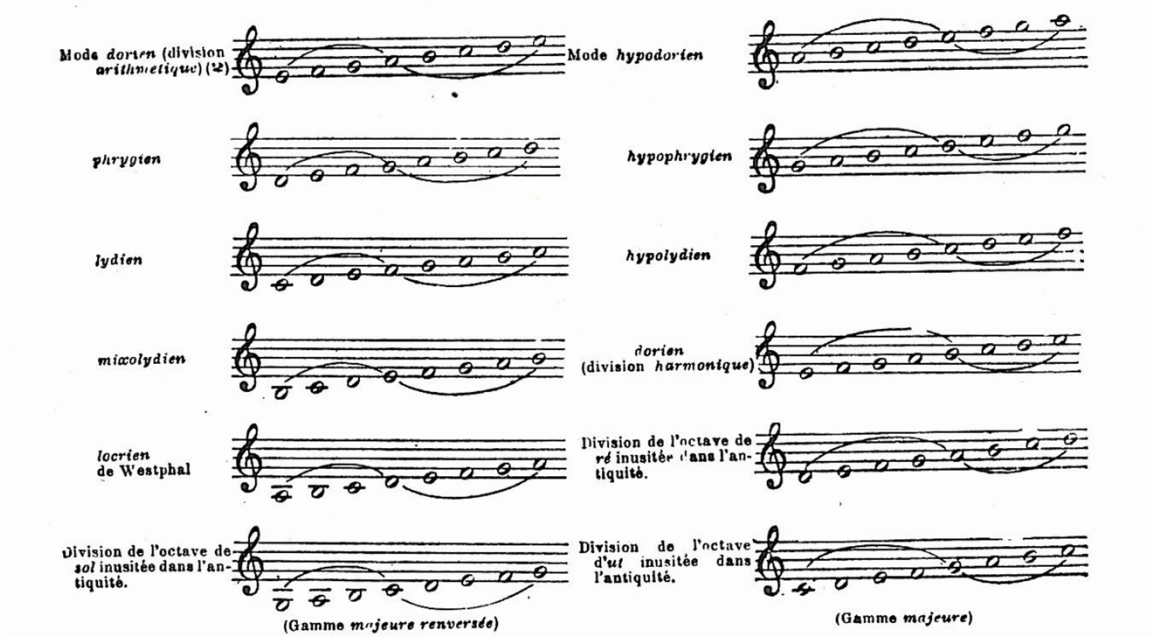
(1a) SCALES GENERATED BY THE OCTAVE GENERATOR BASED ON THE THIRD KIND OF FOURTH



(3) SCALES GENERATED BY THE GENERATOR OCTAVE BASED ON THE SECOND KIND OF FOURTH

We now give the table of the twelve diatonic scales. In the left column are the six scales that divide into a fourth and a fifth (starting with a dominant); in the right column, the six scales that divide into a fifth and a fourth (starting with a tonic). These twelve scales, which differ between them either by the compostion of their intervals, or by the cut of the octave, thus constitute *modes* that exhibit particular *expressive qualities* [Note 2] We have given to all those that were used in Antiquity the names of the *modes* to which they belong: [Note 3] [Note 4]

TABLE OF THE TWELVE DIATONIC SCALES



Examining this table, we can see that each of the seven degrees of the diatonic octave serves as the basis of a scale. All except two of these scales admit the double *arithmetic* and *harmonic* division, except two: the scale starting with B can only be divided in one way, into a fourth and a fifth, because B-F is not a perfect fifth; and the scale starting with F can only be divided into a fifth and a fourth, because the interval F-B is not a perfect fourth. So instead of fourteen scales, there can only be twelve.

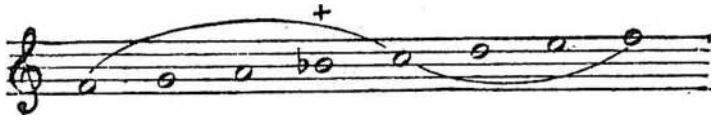
This confirms the principle stated above.

DIATONIC SCALES USED IN ANTIQUITY

Of these twelve diatonic modes, seven especially were used in antiquity: the Dorian, Hypodorian, Phrygian, Hypophrygian, Lydian, Hypolydian and Mixo-Lydian. The so-called Locrian mode, according to Westphal, was less often used. The generating scale of this mode (5th scale in the right-hand column of the table above) was proscribed by the

ancient theorists. According to Mr Gevaert, it did not begin to be used frequently until the end of the Middle Ages.

Our major scale was not one of the octaves adopted by the ancients. However, by virtue of the existence of the two systems, the *conjoint* and the *disjoint*, the combination of which formed the *immutable system*, [Note 5], they could, as they wished, sound in the same melody both the B natural and the B flat. Now, by engaging the conjoint system in the Hypolydian octave, that is to say by sounding the B flat, we obtain the major scale.



By sounding the B flat in the Lydian scale, we produce the 6th scale in the left column of the table above, or the reverse major scale (starting with a dominant):

One need hardly stress that one should not confuse the Lydian (without B-flat) with our major scale, as the Lydian is in the series of scales that are divided into a fourth and a fifth (starting with a dominant), whereas the major is in the series of scales divided into a fifth and a fourth (starting with a tonic).

PLAIN-CHANT MODES COMPARED WITH THE DIATONIC SCALES USED IN ANTIQUITY

In western plain-chant, the number of modes has been reduced from twelve to eight, divided into four authentic modes and four plagal modes.

The scales belonging to the authentic modes extend from one tonic to another, located one octave above. They correspond, by their extent and by the final, to the ancient scales whose name begins with the preposition hypo ... [Note 6]

The scales belonging to the plagals operate between two dominant. They correspond, in their extent, to the the ancient scales whose name is not prefixed by the preposition hypo; but they differ in the final. In fact, in plain-chant, each plagal mode has the same final as its authentic. It follows that for the eight modes of plain-chant there are only four finals, that is to say four scales.

The first, that of the 1st mode (authentic) and of the 2nd mode (plagal), is the diatonic scale based on the tonic D, with the B flat: it does not differ in any way from the Hypodorian scale transposed to the lower fifth. [Note 7].

The second, that of the 3rd mode (authentic) and of the 4th mode (plagal), has E as its base: it is the old Dorian mode.

The third, that of the 5th mode (authentic) and the 6th mode (plagal), is based on the tonic F: it is the ancient Hypolydian. Sometimes, in the melodies of these two modes, one meets

the B natural: it is then the pure Hypolydian. Sometimes we meet the B flat: it is then the Hypolydian having its fourth degree altered, or the major scale.

The fourth scale, which belongs to the 7th mode (authentic) and 8th mode (plagal), is based on the fundamental G [Note 8]: this is the ancient Hypophrygian. [Note 9]

COMPARISON BETWEEN THE MODES OF GREEK ECCLESIASTICAL MUSIC AND THE ANCIENT DIATONIC MODES

In Greek ecclesiastical music, the (authentic) *master* modes and the plagals differ, not only in extent, but in their finals. Byzantine theory recognises for its different scales not four, but *seven* different finals. If we disregard the intervals of three quarters and five quarters of a tone which colour most of them [Note 10], and if we reduce them to pure diatonic, we find in the scales of the Byzantine modes the seven diatonic octaves used in Antiquity.

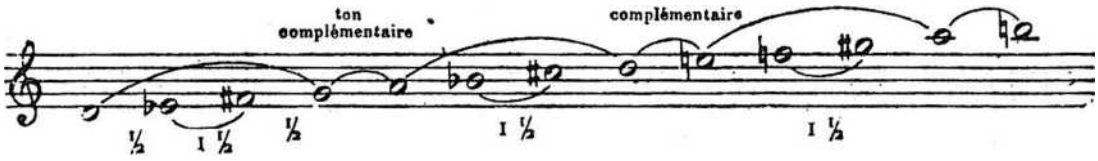
We recognize the Hypodorian octave in melodies of the 1st mode, usually transposed to the lower fifth and in a certain number of melodies of the 1st plagal mode; the Hypophrygian octave in the variant of the 4th mode which is based on G (variety άγια) [Note 11]; the Hypolydian octave (having the fourth degree altered by a flat}, in the 3rd mode, and in the 3rd plagal mode with F for base; the Dorian octave, in the variant of the 4th mode, called Ιέχετος; the Phrygian octave in a large number of melodies 1 "plagal mode, and in the variant of the 4th mode that has D as its base [Note 12]; the Lydian octave in the 4th plagal mode [Note 13]; finally the Mixolydian octave in the 3rd plagal mode that has B as its base (in the *grave* mode).

Byzantine music also has two other modes whose scales do not belong to the diatonic genus: the 2nd mode, the scale of which belongs to the semi-chromatic genus; and the 2nd plagal mode, the scale of which is chromatic.

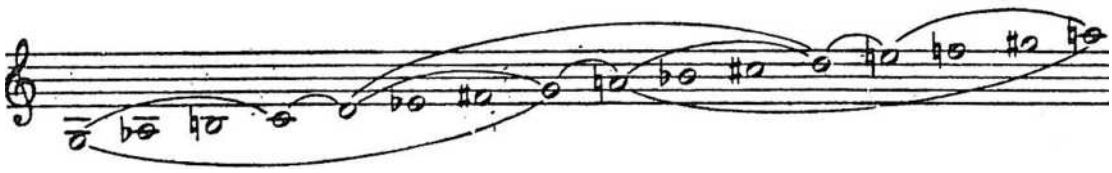
We shall say a few words about this last scale, which is not only used in ecclesiastical music, but is very frequently employed in popular oriental songs, especially in Turkey. Several examples can be found in this collection.

ON THE ORIENTAL CHROMATIC

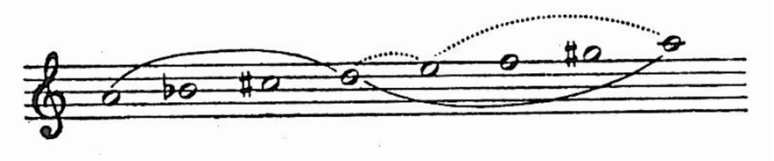
The scale that we shall designate by the name of *oriental chromatic* consists of a succession of chromatic fourths [Note 14] similar to each other, separated by an additional complementary tone. [Note 15]



It follows that the base of each fourth becomes the base of an octave composed of two identical fourths separated by a complementary tone. Naturally all these octaves are the same in terms of the composition of their intervals:



In each octave the fourth must be at the base, and fifth {complementary tone plus fourth) at the top. This is equivalent to saying that the scale enclosed within the limits of each octave begins with a dominant. For example:



If we compare the oriental chromatic scale with the European minor scale, we will see that it differs from it by the perfect conformity of its two fourths to each other, and by the order in which the fourth and the fifth follow one another:

Oriental chromatic scale

Minor scale

The oriental chromatic, having the fourth at the base of the octave, begins with a dominant, whereas the minor scale, having the fifth at the base of the octave, begins with a tonic.

The composition of the oriental chromatic is perfectly regular. Its scale is formed, like the three diatonic generator octaves, of two identical fourths – A, B flat, C sharp, D; E, F, G sharp, A – separated by a complementary tone. The minor scale, on the other hand, is a hybrid resulting from the joining together in the same octave of two dissimilar fourths. The top fourth (A, B flat, C sharp, D) is a chromatic fourth; the one below (E, F, G, A) is a diatonic fourth of the first kind (the fourth which enters into the composition of the Hypodorian and Dorian scales). If we give the minor scale an upper fourth the same as the lower fourth, we obtain the Hypodorian scale:

If we give it a lower fourth similar to its upper fourth, we would obtain the following scale:

which is none other than the oriental chromatic scale having the fifth placed in the lower part of the octave or based on the tonic. This scale exists in the Orient, where we have encountered it occasionally [Note 16], but much less frequently than its generator based on the dominant. This latter is encountered there, so to speak, at every step.

We thought we had discovered a certain affinity between the oriental chromatic (based on the dominant) and the diatonic Lydian. Should we see in the oriental chromatic a Lydian scale having its second and sixth degrees lowered by a flat? We leave it to people more competent than ourselves to decide this interesting question.

ANCIENT MODES STILL USED IN THE POPULAR SONGS OF THE ORIENT

We found in Greece and especially in Turkey countless examples of the oriental chromatic. You hear a very small number of melodies in the minor mode [Note 17]. On the other hand Hypodorian, which differs from the European minor only by the absence of the *note sensible*, is a mode very used in the popular melodies of Greece. We have also encountered quite frequently the Dorian, the Phrygian, the Hypophrygian [Note 18] and the Mixolydian. The Mixolydian tunes which we found confirm the opinion of Mr Gevaert, who ranks the Mixolydian mode among the Phrygian harmonies and considers its scale as a scale of G (with F natural), starting and ending on the median B. We have not found any example of the B scale divided into a fourth and fifth [Note 19]. Hypolydian is widely used; it occurs most often with the alteration of the fourth degree and in this case merges with the European major. As for the Lydian, we have generally found it in an irregular form, either coupled, in the same tune, with a different mode, or occurring in a mixed genre of diatonic and chromatic.

HYBRID SCALES

It is not uncommon to meet in the East melodies constructed with scales composed by a putting together of fourths belonging to different modes or genres. There is nothing shocking about these hybrids to the ear, which accepts them very readily – our minor scale is itself only a hybrid – but they are sometimes very difficult to classify.

We have tried to determine the mode to which each of the melodies in this collection belongs, although for some of them this work has been rather difficult. Whenever, in order to classify a melody, we have been in doubt, we have got out of the embarrassment by proposing the solution most in accordance with the sentiment which had guided us in harmonising it.

TRANSLATOR'S NOTE

Reading the songs that make up this collection, one might wonder why the translation of the sung versions was done in Italian rather than French. The answer is simple: there is more similarity between Italian poetry and modern Greek poetry than between it and the French; there are certain images, certain turns of phrase that one might justly consider too naïve or too raw in our idiom, but when rendered in Italian they maintain the meaning and the flavour of the original.

The reader may occasionally be surprised to find among the lines of a given stanza a line in a different metre. It would have been easy to make this irregularity disappear; but since I wanted to respect the original text and melody as scrupulously as possible, I preferred to allow an irregular line rather than alter the meaning of the text or to force the musician to modify, even in an insensitive way, the feel of the melody. I thought there was no point in writing down the correct line which, for the reader, if not for the singer, should be substituted for the less regular line. These instances will be easy to spot, especially when it suffices to replace, for example, the word *amore*, of three syllables, by that of *amor* which has only two. As we know, both are used indiscriminately in Italian poetry.

Besides the translation into Italian adapted to the music, readers will also find a literal prose translation of the Greek words into French. In this way, even without knowing modern Greek, they will be able to get an exact idea of this popular poetry.

I must address my sincere thanks to Mr Cassiotis and Mr Hodji, who kindly gave me the precise meaning of the Greek text and thus facilitated my task.

A. DE LAUZIÈRES.

AUTHOR'S NOTE

We join with Mr. de Lauzières in expressing our gratitude to Messrs Cassiotis and Hodji. If we have any claim to be presenting to the public a correct version of the Greek text, we owe it in large part to their kind collaboration.

Thank equally to Émile Legrand for his assistance in correcting the Greek text and proofreading.

So as to leave no doubt in the mind of the reader, we shall indicate here the meaning of various signs that are used in the course of this work.

= This sign, which is sometimes found in the Greek text after or before a syllable, indicates a word that has been truncated. In Greece, popular singers have no qualms about cutting a word in half in order to meet the requirements of the musical phrase.

< > This form of parenthesis is used only in the French translation. It is indicates text that has been added by the translator, words that do not appear in
The term επιφθεγμα was used in Antiquity, and γύρισρα in modern Greek, to indicate a word or prase that is added either at the end or in the middle of a line, and which counts for nothing in the overall quantity. The επιφθεγμα, when it consists of a whole line or several lines inserted between the verses, is nothing more than a refrain. Most of the time it is used as a kind of extension, whenever the poetic metre is too short for the musical phrase. Thanks to this method very frequently used in popular productions in the Orient, nothing could be easier than to fit to the form of a melody that of the verse that we wish to match to it. However primitive such a process may be, it is undoubtedly far preferable to those awkward repetitions of words of which we find many examples in certain learned productions of European art. It explains how the rhythm and form of Oriental melodies have such an infinite variety, even though the divisions of the lines intended to be sung comes down to a very small number of more or less invariable types.

The most commonly used poetic form for popular songs in the Orient distich for a single couplet. Each couplet consists of two verses of fifteen syllables. Sometimes there is a whole

distich for a couplet and sometimes, when the melody is shorter, or if there is an επιφθεγμα, the first line of the distich alone forms a first couplet and the second line forms a second couplet.

In the couplets we have collected, the fifteen-syllable verse is constructed in two different ways. Sometimes it is equivalent to two French lines, of which the first, composed of eight syllables, would be feminine, and the second, composed of seven syllables, would be masculine. Sometimes it is equivalent to two lines of which the first, of eight syllables, would be masculine, and the second, of seven syllables, would be feminine.

Any couplet can be sung to the tune of any given melody, provided that its rhythmic construction conforms to that of the couplet for which the music was originally made. It goes without saying that here we are talking only about prosodic matching; if it employed a similar process without due discernment, it would result, from the point of view of meaning, in monstrous couplings between music and lyrics.

In the course of this work, in order better to understand the mechanism of the various rhythms used in the composition of Greek couplets we have indicated a number of instances where the same words can be set to different tunes,. We have thought it unnecessary to point them all out; once readers are on the right track, they will easily be able to recognise where such transpositions are possible.

L.-A. BOURGAULT-DUCOUDRAY.

NOTES

[1] Here we are referring to the diatonic genre.

[2] In figures **A**, **B** and **C**, we have expressed the notes of the generator octave by rounds. In figure **A**, the E – E octave, divided into a fourth and a fifth (EA – AE), generates a scale divided into a fifth and a fourth (EA – AE). The same octave, divided into a fifth and a fourth (EB – BE), generates a scale divided into fourth and fifth (BE – EB). In figure **B**, the D – D octave, divided into a fourth and a fifth (DG - GD), generates the GD - DG scale; divided into a fifth and a fourth (DA - AD), it generates the AD – DA scale. In figure **C**, the octave C – C, divided into a fourth and a fifth (CF – FC), generates the scale FC – CF; divided into a fifth and a fourth (CG – GC), it generates the GC – CG scale. As one can see, each octave is always composed of two similar fourths plus a complementary tone which may be positioned either in the middle, or at the beginning, or at the end.

[3] The expressive character of a mode depends on the place occupied by the half-tone in each of the two fourths and that occupied by the complementary tone in the octave. The scales starting with a dominant give rise to an idea of suspense; those starting with a tonic, an idea of rest. The constitution of these different scales leads to special harmonic combinations for each of them, as can be seen in what follows below.

[4] When the octave is divided into a fourth and a fifth, the division is called *arithmetical*; when it is divided into a fifth and a fourth the division is called *harmonic*. Archaeologists do not agree on the way of dividing the Dorian octave. Some divide it into a fourth and a fifth (this is the opinion of Mr Gevaert); others, relying on an article by the theorist Gaudens, divide it into a fifth and a fourth. Here we have represented both of the divisions.

[5] See the commentary on Song No. 4 below.

[6] One has to exclude the 3rd Gregorian mode (authentic), which is an ancient mode whose name is not preceded by the preposition Hypo – (the Dorian mode).

[7] Some melodies of the 1st and 2nd mode belong to a scale which has D for its tonic with the B natural (no. 5 in the right-hand column of the table of diatonic scales). We have seen that this mode has no equivalent in the music of Antiquity.

[8] For the use of the word “fundamental”, see the note at the end of the commentary on Song No. 6 (below).

[9] Mr Gevaert considers as Phrygian melodies (ending on the dominant) the melodies of the 7th and of the 8th mode, belonging to the scale of G with B flat, and as Mixolydian melodies, the melodies of the 4th mode belonging to the scale of E with B flat. Both would thus be disguised by a transposition to the upper fourth.

[10] See our *Études sur la musique ecclésiastique grecque* (published by Hachette, Paris).

[11] From the ecclesiastical melodies that we know, the 4 plagal mode (variation "*l* "), which is similar to the Hypophrygian mode make-up of its intervals,, differs in its division of the octave. It seems to admit, not the Hypophrygian division into a fifth and a fourth, but the division into fourth and fifth proper to the major scale when reversed. If this is so in all cases, our claim of similarity is true between the two octaves, but not between the two modes.

[12] The melodies of this mode appear not to be transposed, while those belonging to the 1st plagal mode are generally transposed to the upper fourth or fifth.

[13] We shall make a further restriction here. In stating that the scale of the 4th plagal mode is similar to the Lydian octave, we should add that we are not certain that the division of the octave is the same in both modes.

[14] There were in Antiquity three kinds of chromatic fourths: The one that is used in the oriental chromayic consists of two half tones plus a triple half tone (one and a half tones). This is the fourth that the ancients called the chromayic fourth of the second species.

[15] This succession can be extended above and below the limits assigned by this example.

[16] See Song No. 29.

[17] Most of those that we encountered have a more or less marked Italian color.

[18] There is no melody in this collection belonging to the Hypophrygian mode properly defined; but we have quite a few samples of the melodies and dance tunes which we intend to publish later, assuming that the public welcomes this present publication.

[19] See the fourth scale in the left column of the Table of Diatonic Scales, above,

Ends