

Reading Psalmodia

Part III

Sections 13 through 19 of the Text

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13. PITCH.

Modern Psaltai tend to regard the pitch of the written notes as entirely relative. The nineteenth century Patriarchal authorities, on the other hand, attempted to fix the pitch of the written notes in relation to a precisely defined pitch for Ni. In effect, they defined the Ni of Tone Eight as slightly flatter than the C of Concert Pitch. This attempt at exact definition was part and parcel of an international Nineteenth Century culture of numerical precision: just as the pitch of Ni was precisely defined in terms of vibrations per second, precise (but not always the same precise) definitions were offered of the microtonal intervals both of the two chromatic scales and of the intervals produced by the effect of accidentals. Eventually a monstrous instrument was invented to play all the possible notes of psaltic music – something stringed instruments can do perfectly well.

In practice, there is no possibility of giving an exact pitch to Ni or Pa as a means of defining the exact pitch of every note of every mode. Firstly, Psaltai have different voices with different ranges, and pitch the music differently in order to sing it well and reverently. Secondly, the priest and the deacon have also voices with a particular range that leads them to prefer to sing their own parts of the service at a particular pitch. Indeed, considerations of vocal range can lead to conflict between clergy and singers as to the pitch at which a service should be sung. On the whole, peace seems to be attained most easily if the priest makes clear the note on which he prefers to chant, and the Protopsaltes organises the Psalmody in such a way as to accommodate him. *(This may mean singing at a higher or lower pitch than he would otherwise prefer, or, in extreme cases, where, for example, the priest sings Ni=G or Ni=F, by basing the Psalmody on the tetrachord below the base note of the mode or on the upper tetrachord of the modal scale - e.g. singing Tone VIII based on the G below Ni or on the G above, or in the case of Tone I, basing the scale on the Ke below Pa or basing the melodies in the tetrachord on the Di above. &c.)*

If both clergy and Psaltai have a good vocal range, then a pitch can be chosen that approximates to that officially laid down by the Patriarchal Epitropoi, i.e., the Ni of Tone VIII can be pitched somewhere between B flat and C.

During a service it is not appropriate for the tuning of the Psalmody to be shifted, unless it is absolutely essential. Where such changes occur they should reflect the structural divisions of the Liturgy.

In an extreme case it is possible for priest and psaltes, or even for psaltes and lampadarios, to sing at different pitches, the result is bizarre and undesirable but perhaps better than a diet of screeching and groaning.

MODULATION from TONE to TONE:

Within a single service, and sometimes even within a single piece, the chant will move amongst the different Tones, and from one mode to another within a single Tone. Normally the modulation is accomplished without transposition of pitch. In the case of the diatonic modes this is easy to understand: the Pa of Tone I becomes the Pa of Tone VII or of Tone V, the Vu of Tone IV becomes the Vu of Tone I or of Tone VIII. The Enharmonic and Chromatic modes require more careful attention: modulation without

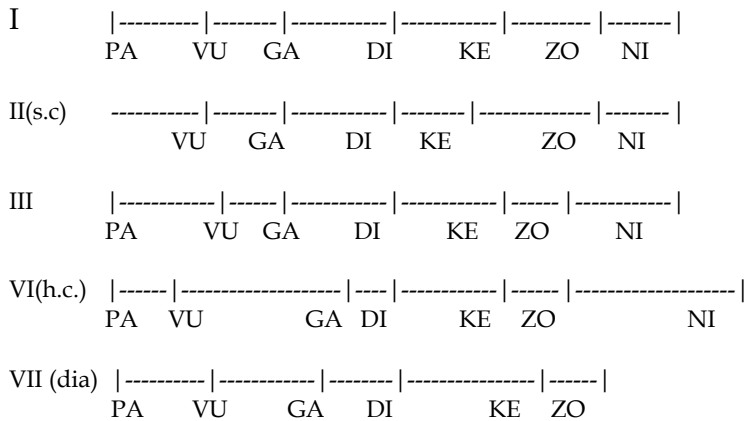
transposition is easy to achieve once the identity or non-identity of the corresponding notes of different modes is established. For example, it should be clear that the notes Pa and Vu of Tone I cannot *both* be identical with the corresponding notes of Tone VI: the note Vu of Tone I is a minor diatonic tone above the note Pa of Tone I, whereas the note Vu of Tone VI (Plagal II) is a small chromatic semitone above the Pa of Tone VI. Nor can the Pa and Vu of Tone I both be identical with the Pa and Vu of Tone III: the Vu of Tone III is an enharmonic semitone above Pa.

Traditionally, teachers of Psalmodia taught their students the scale (Pa-Pa') of the First Tone before they learned any other. More recent teachers, influenced by the importance of the major scale in European music, often begin by teaching students the diatonic scale Ni-Ni' of Tone VIII. It is possible to create a stable base for Tone to Tone modulation by treating Ni or Pa as a fixed note, and defining all other tones of all other scales in relation to that note. The note Di, however, has a greater stability across the different Tones than either Ni or Pa. In addition, the Musical Range of Psalmodia is defined in terms of a two octave di -Di -Di ' scale. For these reasons, the note Di provides the best fulcrum for Tone to Tone transposition.

A simple diagram will make the problem clearer.

If we assume that the note Di has the identical pitch in the different modes, then the pitch of other notes will differ approximately as follows:

Diagram A

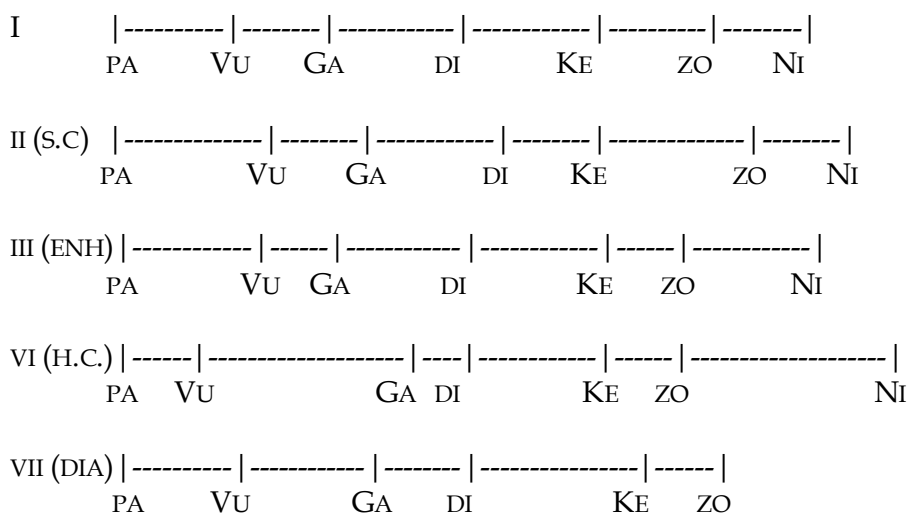


From the diagram it is easy to see that if the note Di remains constant in the scales illustrated, i.e. Tones I, II (soft chromatic,) III (enharmonic) VI (Plagal II, hard chromatic) and VII (diatonic with microtonal sharpening of Ke,) then in most scales the note Pa is also constant.

The most serious problem of transposition occurs in moving from Tone II to other scales. The soft chromatic scale uses a range of intervals that means it has very few notes in common with certain other scales. One might be tempted to infer that this problem has been caused precisely because we have chosen to treat Di as a fixed note. This problem is not solved if instead of accepting Di as a fixed note we accept Pa. As the diagram below illustrates, the soft chromatic scale still has very few notes in common with other

scales even if we accept Pa rather than Di as having a constant pitch across scales. The problem arises from the nature of the soft chromatic scale and the specific notes it uses, rather than from the choice of Pa or Di as a constant pitch across modes.

DIAGRAM B



Apart from not solving the problem of the relation of Tone II to other Tones, as the above Diagram B illustrates, taking Pa as a constant offers no advantage over the choice of Di .

Two radical solutions have, however, been proposed to the problem of the relation between Tone II and the other Tones.

The great Protopsaltes *Georgios Raidestinos* (1833-89) attempted to persuade his colleagues that Tone II should take Ke as its basic note, not Di , i.e. that we should sing melodies in II as they are now sung, but **thinking** the note we now write as Di as Ke, the note we write as Pa as Vou. His reasons for arguing this are to do with the relation we should normally expect to exist between an Authentic Tone and its corresponding Plagal Tone, but quite different reasons for taking his thesis seriously will emerge from an inspection of the relation between different Echoi that emerges if we consider them side by side both in his system and in the more conventional. If his arguments were to be accepted, then the two diagrams would have to be redrawn as illustrated below.

The first diagram shows the effect of accepting Raidestinos's account of Tone II on the diagram that illustrates the relation of notes in the different Tones which holds if we assume the note Di to have a constant value. The result, Diagram C, is, to say the least, a convincing argument in favour of Raidestinos's thesis: suddenly, Tone II ceases to look like an unhappy anomaly within a well-ordered and intelligible system of Tones, and its notes now have a much more intelligible relation to the notes of other scales. Diagram C should make this clear. Diagram D confirms what Diagram C has already shown: Raidestinos's version of Tone II makes much more sense than the conventional account! Both diagrams yield a set of scales where the pitch of both Pa and Di remains constant **in every Tone**. Indeed, as the reader may have noticed, the two diagrams C and D are identical. Raidestinos seems to have musical logic on his side - unfortunately the whole

corpus of published Psalmodia other than his own is written on the common assumption that Tone II has Di as its basic note. Sadly, there is little prospect of reviving Raidestinou's argument about the base of Tone II with any great hope of success.

RELATION OF NOTES OF THE TONES ASSUMING

1] DI REMAINS CONSTANT;

2] THAT TONE II IS BASED ON KE NOT DI

Diagram C.

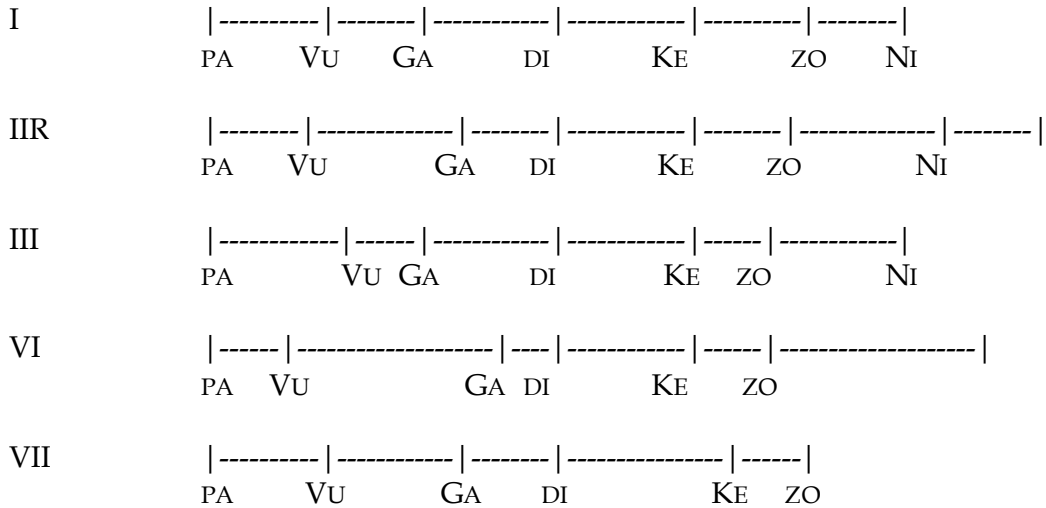
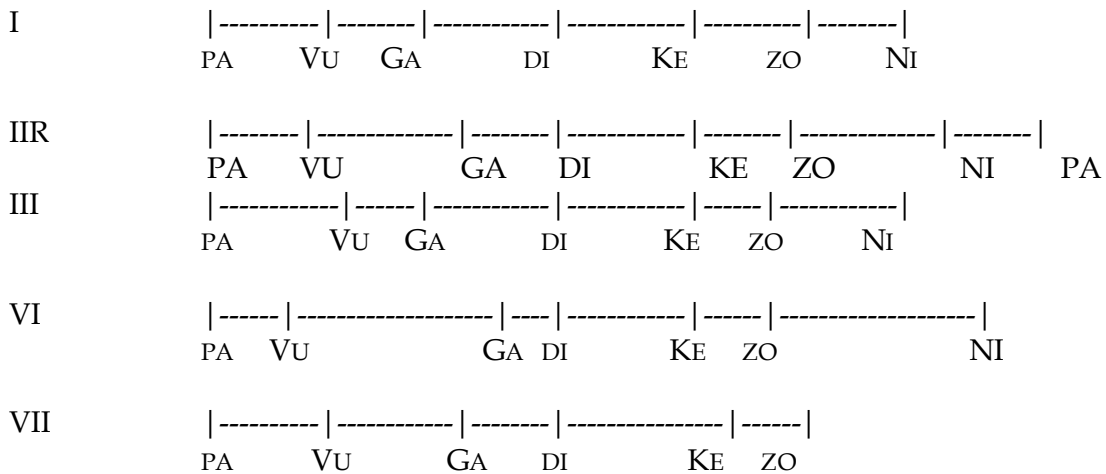


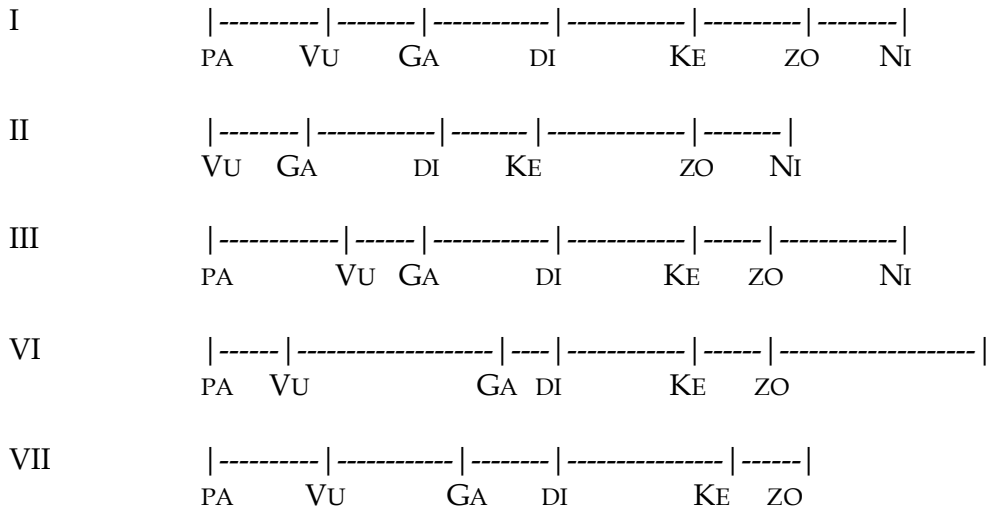
DIAGRAM SHOWING RELATION OF NOTES AS ABOVE, BUT TAKING PA AS CONSTANT AND FOLLOWING RAIDESTINOUS' INTERPRETATION OF TONE II.

DIAGRAM D.



The second radical approach to the problem of modulation into and out of Tone II is that used those teachers of Psalmodia who instruct their students to modulate by treating the Pa of Tone I as the Vu of Tone II. This practice is remarkably widespread, though it reduces the relation amongst the Tones to utter chaos and violates the most basic musical logic. Here is the pattern of pitch values it produces:

DIAGRAM E



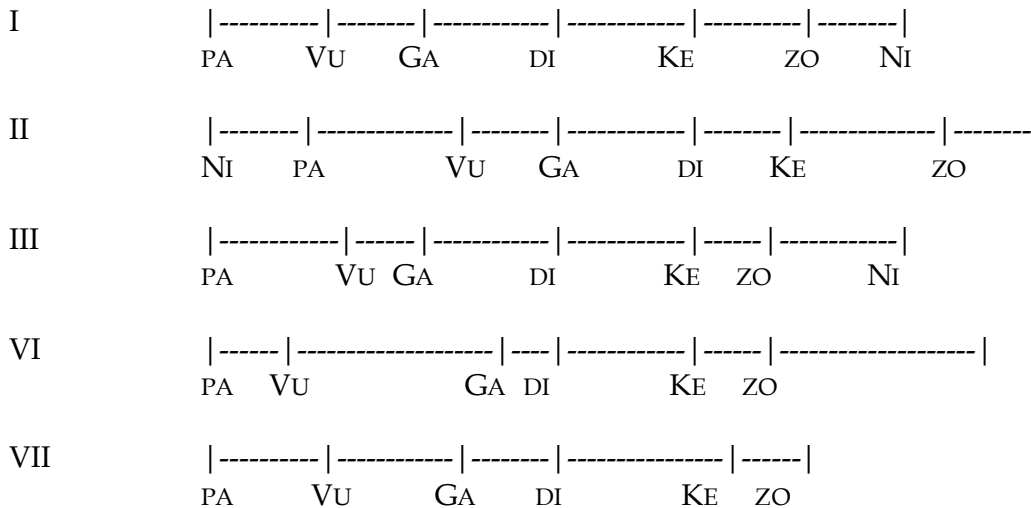
What is to be done? The practice of moving from I to II by turning the Pa of I into the Vu of II is musically illogical and should not be followed. Two solutions seem to yield coherent musical results:

1] **To keep the note Di at a constant pitch across all Tones.** This yields the relation amongst Tones illustrated in Diagram A above.

OR

2] To achieve Raidestinos's intended objective by **identifying the Ke of Tone I with the Di of Tone II** (as the music of the Tone is commonly written.) This latter method produces the following result:

DIAGRAM F



The second of these methods seems preferable. Indeed, the practice of making the Pa of I the Vu of II seems rather like a misguided attempt to attain the same end. Whichever of these two systems of modulation is used, it is essential that all Psaltai and ison singers are aware of it and use it.

14. THEORY and PRACTICE.

One of the less acceptable aspects of many conventional manuals of Psaltic theory, is the easy and oft repeated assertion that there is a difference between theory and practice. This view has at least an ancient pedigree: the theoretical manuals produced in the Palaiologan period accepted the same view. Already in the Mediaeval manuals the gap between theory and practice emerges since the theorists were determined to deal with interesting mathematical aspects of musical theory that might find little image in practice, and equally since the authors based their theorizing on older texts which both attempted to link Byzantine music with what they knew of ancient Greek music, and tended to discuss the chant as it may have existed at an earlier period rather than analyse contemporary practice.

Byzantine chant is part of a living, developing musical and liturgical culture. External influences played a significant role in the chant's development. During the period of Ottoman rule, the great Psaltai of Constantinople found themselves in demand as court singers. Many Psaltai studied and performed Ottoman Perso-Arabic classical music as well as Byzantine Psalmodia. Indeed, Peter Lampadarios, Konstantinos Protopsaltes, Zacharias Hanade and Theodoros Phokaeos were all great experts on Ottoman music as well as significant figures in the history of modern Psalmodia.

Eighteenth century theorists of Psalmodia freely accepted the identity of the Tones of Psaltic chant and certain of the Maqams (modes) of Ottoman music. Konstantinos Protopsaltes explains the relation between Tones and Maqams with quite extraordinary clarity and conciseness in what was published later as the *Ermineia Tis Exoterikis Mousikis*. His exposition makes it evident that a family of maqams corresponds to each Tone, each maqam differentiated from the other by a subtle difference in the tuning of specific notes, or by a different pattern of melodic progress in ascent or descent or both, and a difference in range. The Psalmodia of the Ottoman period was composed by musicians who were frequently steeped in Ottoman court music as much as in Byzantine chant, were familiar with Muslim religious music, and often acquainted with both the notation and the practice of Western European music. It should not, then, be a surprise that the Psaltic compositions we have inherited bear the marks of both Ottoman and Western influences: the great Psaltai who composed or arranged the chant were working within a living and confident tradition that was open to adaptation, and they were ready to take into Psaltic practice elements that enhanced and beautified it, rather than attempting to maintain absolute purity of tradition.

For theorists, the flexibility and adaptability of the Psaltic tradition poses a problem. The books produced by their predecessors describe an earlier state of Psalmodia that can be significantly different from contemporary practice. There is, moreover, a considerable problem for theorists in finding the right balance between prescriptive and descriptive approaches. It is, for example, quite clear that modern Psaltai generally use a scale for pieces in Tone IV on Vu which uses different notes from the scale they use to sing pieces in Tone VIII. Now, how is the theorist to cope with this? Is the practise of singing Tone IV on Vu in a distinctly non-diatonic mode simply a corruption of the diatonic system to be ignored by the theorist, or is the theorist to measure the intervals *actually* used when Tone IV is sung in this non-diatonic mode, and to present these as the tuning of Tone IV

on Vu? The same question arises with regard to the modern custom of flattening Vu in descent in Tone I: is this a corruption or simply a new development?

Certainly, Petros Lampadarios might have been surprised to hear a modern version of the Kanon in IV or the introduction of a flattened Vu into his compositions in Tone I. On the other hand, he would have noticed that the *Anastasimatarion* usually published under his name does not actually contain his music as he wrote and sang it, but a nineteenth century version of it edited by John the Protopsalt. Indeed, much of the classic repertoire of chant does not consist of classic pieces in their original form, but in an edited and reworked form better adapted to the taste of a later period., frequently by melodic elaboration and enhanced chromaticism.

At the end of the day, it is neither possible nor desirable to freeze Psalmodia in the form current at some particular period of history. Procrustes must not become the patron saint of Psaltic practice. On the other hand, a merely descriptive approach to Psaltic theory poses two virtually insoluble problems, collection and selection - how to collect the enormous mass of evidence that would be required in order to describe the full range of Psaltic practice, and how to select precisely which version of the practice is to be taught.

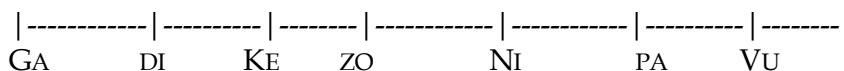
In this manual, I advise singers not to take up the habit of flattening Vu in Tone I and to consider using a true diatonic tuning of Tone IV. The reason for these choices is partly a matter of musical taste, partly a desire to defend a conservative version of Psaltic practice, partly a wish to have the classic repertoire sung in a tuning its composers would recognize, and partly a feeling that the modern taste for florid psaltic music ornamented with complex chromatic flourishes is inappropriate to a liturgical art, puts an unnecessary price on virtuosity and emotionalism, and, given where this book is written, is singularly ill-suited to the development of Psalmodia in Great Britain.

C] DIATONIC and ENHARMONIC.

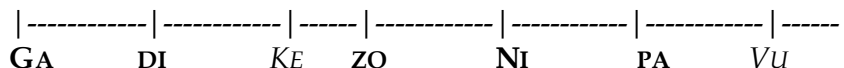
There is a close relation between the diatonic modes and the so-called enharmonic modes. In order to sing the scale of Tone III, for example, all that is required is that the notes Vu and Ke are sung slightly sharper than in the corresponding diatonic scale. Consider

Diagram G:

DIATONIC SCALE ON GA



ENHARMONIC SCALE ON GA



As the diagram makes clear, the notes Ga, Di , Zo, Ni, and Pa of the diatonic scale on Ga are sung at **exactly** the same pitch as the corresponding notes in the enharmonic scale on Ga.

DJ HARD and SOFT CHROMATIC

Psalmody makes use of two chromatic scales, the Soft Chromatic and the Hard chromatic. The relation between them in current practice is frankly quite obscure. Indeed, moving between them is probably the most difficult exercise in Tone to Tone modulation. In Diagram H the two scales are presented side by side:

Diagram H

II (S.C.) -----|-----|-----|-----|-----|-----|
PA VU GA DI KE ZO NI

VI (H.C.) |-----|-----|-----|-----|-----|
PA VU GA DI KE ZO NI

If, however, we take Raidestinos's proposal to see Ke as the basic note of the soft Chromatic scale, a very different, and much more intelligible pattern emerges, that allows us to interpret much more easily the precise relation between the two forms of Chromatic scale.

Diagram I

II (RAID) |-----|-----|-----|-----|-----|
PA VU GA DI KE ZO NI

VI (H.C.) |-----|-----|-----|-----|-----|
PA VU GA DI KE ZO NI

The two chromatic scales in this interpretation are close variants of each other: the notes Pa, Di and Ke have the same pitches in the two scales, the chromatic intervals which define Vou, Ga, Zo and Ni are closer to diatonic intervals in the soft scale and further from the diatonic in the Hard.

15 MELODIC ACCENTS

A characteristic feature of Psalmody is the use of melodic accents, small decorations or melodic flourishes, which mark accented notes in the melody. Flutter (*petasti*,) Heavy Accent (*bareia*,) Accented Diminuendo (*psiphiston*,) Ripple (*omalon*,) and Shake (*antikenoma*) are all used to indicate such melodic accents. In practice, different Psaltai interpret these signs in widely different ways. The following interpretation of the signs is, accordingly, no more than a suggestion. Individual teachers may have quite different interpretations to offer.

Melodic accents are a normal part of Psaltic chant to the extent that a Psalter will frequently use them even when the musical text does not show them. A sequence of syllable sung on the same pitch or to a pattern of rising or falling seconds with not other accent than the stress or emphasis given by the rhythm of the chant is alien to Psalmody. Faced with such a phenomenon, the Psalter feels well-nigh compelled to add tiny melodic flourishes to certain accented notes to enliven the chant. A well-written musical text will normally indicate the melodic accents and their placing.

The Flutter (∩) is a common sign. It indicates a rise of one note (a second,) but unlike the step (—) it calls for a tiny melodic flourish at the start of the note which brightens and enlivens it. The Flutter is sung as follows: the Flutter indicates a rise to the step of the scale next above the one which precedes the Flutter, the voice rises to that pitch with

a distinct attack, then a rapid ornament is sung in which the voice rises very briefly to the next step above and then returns. The ornament is executed not as a sequence of distinct notes, but as a slight disturbance of the single note. Most Psaltai place the accent on the raised part of the Flutter, but without disturbing the melodic rhythm. Some Psaltai sing a more complex ornament for the Flutter, where the voice rises very rapidly twice or even three times to the higher pitch, falling back each time to the note of the Flutter.

If the Flutter has a Roll written beneath it (↺), then the brief rising ornament occurs at the end of the first beat, and if the simple version of the Flutter ornament is sung, in many contexts it will be sung more slowly, so that the raised part of the note lasts anything up to half a beat.

The Heavy Accent accentuates the note which follows it. The note is normally at the same pitch or one step below the note preceding the Heavy Accent. In either case, it can be accentuated by means of an attack which begins on the step next above that on which the accented note is to be sung, and then descends to the step on which the note is sung, energising the note at its normal pitch with an emphatic accent. In some combinations of signs, some Psaltai displace the raised note of the Heavy Accent and begin the accented note at the pitch indicated by the written sign and then introduce an ornamentation similar to that used in the Flutter.

The Accented Diminuendo (↷) accentuates the note under which it is written by adding a small melodic flourish in which the voice begins from the step of the scale next below that on which the note will be sung and then moves rapidly to the note which is sung with a marked emphasis. If the Accented Diminuendo is followed by a descending sequence of notes sung to the same syllable of the text, it also affects those notes, indicating they are to be sung increasingly softly and without accentuation or emphasis. If, however, the note after the Accented Diminuendo carries a new syllable, it is accentuated according to the rhythm of the piece and the logic of the text.

The Ripple (↠) is normally found written beneath the Level or Step or beneath two such signs. It affects the sign under which it is written, or indicates a melodic ornament at the conjunction of the two notes indicated by the pair of signs it affects. Psaltai interpret the Ripple in many different ways. It is clear, however, the Ripple indicates a short, rather emphatic figure which is added at approximately the midpoint of a single note, or at the point of conjunction of a pair of notes. Usually it is sung as a glottal shake or turn, or as a figure rising suddenly to a pitch two or even three steps above the note it affects and returning with a rapid and rather jagged movement (i.e. without any portamento.) The "throatiness" of the Ripple is an essential part of its character.

The Shake (↠) is found both under signs for ascent and for descent, but in both cases is normally followed by a sign for descending motion by a single step. The Shake calls for a melodic flourish to the latter part of the note under which it lies, and for the singer to sing the note bearing the Shake and the note following as a combined figure, with no attack on the second note.

16. TRANSCRIBING PSALMODIA into EUROPEAN NOTATION

Psaltic notation is a completely different kind of notation from the European staff notation. The basis of the staff notation is its ability to show the pitch and duration of the notes to be played or sung: psaltic notation shows the duration of notes, but unlike the staff notation it shows not the pitch of a specific note, but the interval between that note and the note preceding it. Moreover, the nature of the staff notation means that the musical text works as a sort of diagram of the melody; the rise and fall in pitch is represented by the place the notes of the melody occupy on the staff. In psaltic notation, all the musical signs lie on or about a straight line, so that the musical text has no real diagrammatic function. Transcribing music from the one notation to the other involves representing the melody in a quite different way from that in which it is represented in the original text.

The staff system uses the semitone as its smallest interval, whereas psaltic music uses microtonal intervals. In general, music written in staff notation is interpreted in terms of the equal temperament system of intervals that corresponds to the tuning of Tone III; there is no obvious way of representing the intervals of the true Diatonic and the two Chromatic scales used in Psalmodia.

Grave as these problems may seem at first sight, they are not insuperable. It is worth recalling that the exact intervals intended by the signs of the psaltic notation is only determinable if we know the Tone in which a piece is to be sung. The same sequence of signs represents a quite different sequence of intervals in pieces written in different Tones. This suggests at least one way of solving the principal problem of transcription: if the Tone of a piece is identified, then the staff notation can be re-interpreted to intend the intervals used in the scales of the specific mode in use. There is, unfortunately, a serious disadvantage to this solution: an inexpert musician attempting to read a piece of Psalmodia transcribed into staff notation will be misled as to the actual intervals intended by the musical text unless she or he knows the tuning of the Tone in use.

Most existing transcriptions intended for use by singers simply transcribe the notes of the melody representing microtonal intervals as semitones and leaving it to the singer's knowledge of the Tones to suggest a more exact interpretation. When, as, for example, in the set of 'bilingual' versions of the liturgical hymns published by Kapsakes, psaltic and staff notations face each other on opposite pages of the book, there is no grave danger of misunderstanding: if the staff notation alone is presented, then misunderstanding is all too probable.

The easiest way to enable accurate transcription of psaltic melodies into staff notation is to add a few new accidentals to the staff system. It has already been argued above that in practice Psalmodia uses three degrees of flat and three degrees of sharp. If we retain the normal flat and sharp of the staff system to represent the middle degree of flatness or sharpness, then we require signs to represent the flattish, the sharpish, the very flat and the very sharp. Two of these already lie at hand: in the equal temperament system a double-flat flattens a note by a whole tone, a double-sharp sharpens it by a whole tone. Psaltic music does not require double-sharp or double-flat signs for such a

purpose, leaving them available for use to represent the very-flat and the very-sharp of psaltic music - a use that has at least the merit of being highly intuitive. If we use the double-flat and the double-sharp in this way, then we need only a pair of signs for the flattish and the sharpish.

A question may well arise as to exactly what interval a flattish or a very-flat intends. This is a difficult question to answer confidently, since the musical theorists, as has already been pointed out, differ as to whether the chant uses twelfths, sixths or quarters of tones. Nonetheless, a general sketch of an answer can be constructed. If we divide the octave into 72 equal steplets, then

- ?? a flattish flattens a note by approximately 1-3 steplets
- ?? a sharpish sharpens a note by approximately 1-3 steplets
- ?? a flat flattens a note by approximately 4-6 steplets
- ?? a sharp sharpens a note by approximately 4-6 steplets
- ?? a very-flat flattens a note by approximately 6-9 steplets
- ?? a very-sharp sharpens a note by approximately 6-9 steplets

The exact interval intended by a specific accidental depends on the Tone in which a given melody is sung. In the Enharmonic modes of Tones III and Varys, for example, the flat lowers a note by an enharmonic semitone of six steplets, whereas in the Diatonic scale on Ni of Tone VIII a flat on Pa flattens it by 5 or 6 steplets, a flat on Vu flattens it by 4 or 5. The theory books in common use all offer a more precise definition of the precise degrees of flatness or sharpness the different accidentals intend, but these precise prescriptions are frankly implausible, and generally ignore the different interval structure of the different Tones.

APPENDIX:. Alternative Analyses of the Scales of the Tones.

So far this book has presented an analysis of the scales used in the Eight Tones which represents the consensus of modern writers on Psalmodia. Other accounts exist. In this appendix a few examples will be offered taken from the *Introduction to the Theory and Practice of Ecclesiastical Music* by Chrysanthos of Madytum, one of the three Great Teachers of the reformed notation (Paris 1821/ Athens 1977) and from the *Interpretation* of Konstantinos Protopsaltes (Constantinople, 1845.)

Unfortunately, neither the Bishop nor the Archcantor uses the 72 steplet division of the octave as the basis of his analyses. Both divide the octave into 68 steplets. This means, of course, that the steplets of the octave as Chrynanthos and Konstantinos analyse it, do not conveniently divide into six whole tones or twelve semitones. Of necessity, any account of a scale six tones or twelve semitones analysed into 68 steplets must result in some tones and semitones being seen as larger intervals than others. It follows from this, that Chrysanthos and Konstantinos cannot possibly have accepted the current analysis of the enharmonic scale of Tone III into five equal tones and two equal semitones, exactly half a tone in size, i.e.

Ni.....12.....12.....6.....12.....12.....6.....12

On page 34 of his *Introduction* Bishop Chrysanthos analyses this scale as follows:

Ni.....12.....13...3.....12.....12.....5.....11

Archcantor Konstantinos offers a quite different analysis. On page 71 of his *Interpretation* he identified Echos III with the Maqam Çargah. (He is not alone in making this identification though some writers identify Tone III with Maqam Acema İran.)¹ His analysis of the scale of Çargah, is , however, something of a surprise:

Ni.....12.....9.....7.....12.....12...3.....13

Signell, for example, analyses the scale of Çargah into 53 steplets as follows:

C.....9.....9...4.....9.....9.....9...4

While this analysis does not yield a scale identical with the **12..12..6.12..12..6.12** scale, it is at least more similar than that proposed by Konstantinos.

¹ see KARL L. SIGNELL, MAKAM, Da Capo Press, N.Y. 1986.

What are we to conclude from this? Were Chrysanthos and Konstantinos simply incompetent at analysing what they heard, sang and played? Or are they recording two ways of tuning the scale of Echos III that differ notably from that accepted as normative in modern books of psaltic theory? One thing is clear: it is ludicrous to imagine that so accomplished a psalter and melurge as Konstantinos was capable of confusing a small interval of 3/68 of an octave with an enharmonic semitone of 6/72 .

The difference between the analyses Chrysanthos and Konstantinos offer and the **12..12..6.12..12..6.12** analysis is not simply a consequence of their having used a scale of 68 steplets rather than 72: Signell's analysis uses 53 steplets, and although even his analysis of Çargah is not identical with the **12..12..6.12..12..6.12** analysis, it has five equal tone and two equal semitones, though the semitones are analysed as half a Pythagorean comma less than half a tone. What is truly startling in the accounts of Chrysanthos and Konstantinos is that they both present three sizes of tone and two of semitone in the scale, though they differ from each other in the size of the tones and of the semitones.

Alygizakis in his excellent study "H OKTAHXIA" (Thessalonika: P.Pournara, 1985), records several theorists, including Chrysanthos, as identifying Maqam Acem Aʿran with Tone III, rather than Çargah. Konstantinos analyses the scale of this Maqam thus:

Di12...3.....13.....12.....9.....7.....12

Signell, on the other hand, analyses the Maqam as:

F.....9.....9...4.....9.....9.....9...4

- which makes the scale of Acem Aʿran identical with that of Çargah transposed a fourth higher.

Bishop Chrysanthos's analysis of the intervals of the soft chromatic Scale of Tone II is as follows:

Ni.....7.....12.....7.....12.....7.....12.....7

The modern consensus is that the soft chromatic scale has the following intervals:

Ni.....8.....14.....8.....12.....8.....14.....8

This case too is puzzling. Chrysanthos records all the larger intervals of the scale as of the same size; the modern analysis distinguishes two sizes, 12 and 14 steplets. Is this indeed a distinction Chrysanthos failed to notice? There is no doubt that in modern practice the interval Ga-Di is a normal large diatonic tone. Equally, there is no doubt that the intervals Vou-Pa and Ke-Zo are audibly larger (*though passages moving from Vu to Pa and then upward without descending to Ni and passages rising from Ni through Pa are often sung with the diatonic tuning of Pa.*) Is Chrysanthos reflecting a different practice, a subtly different way of singing Tone II?

On page 42 of his *Introduction* Bishop Chrysanthos analyses the scales of two modes of Tone Plagal II:

a) The **pure hard chromatic scale**:

Pa.....7.....18...3.....12.....7.....18...3

And

b) the **mixed hard chromatic and diatonic scale**:

Pa.....7.....18...3.....12.....9.....7.....12

Comparing example a) with the standard modern analysis of the hard chromatic:

Pa.....6.....20...4.....12.....6.....20...4

suggests that here too Bishop Chrysanthos is representing the scale as it is currently sung. The distribution of intervals is similar, the very small intervals and the very large intervals occur in corresponding places. The mixed scale represents a common modal variation that usually occurs within a piece, where a melodic passage is based on the upper tetrachord of the diatonic scale rather than that of the hard chromatic. Many Doxastika contain such passages, as does the familiar chant of the Antiphon *Simeron krematai epi Xylou*.

On page 47 of the *Interpretation* Konstantinos asserts that Maqam Segah is Echos Legetos, and Alygizakis (p.216) shows that this Maqam is generally thought to correspond to Tone IV. Konstantinos gives the scale of Segah as

Zo...4.....12.....9.....7.....12.....12.....9
 |
 Vou

This time the scale he presents seems to represent reasonably well the pattern of intervals in Tone IV Legetos as it actually sung, though many singers would sharpen the note Pa more than is suggested here.

Kakoulides, in his useful "Τ?Ο? ? ? ? ? ? ? ?" Athens, 1988, (p. 63) analyses the scale of Tone IV showing an ambiguity in the pitch of Ke and Zo. Here are the two versions of the scale his diagram implies:

a) **Vou.....8.....12.....12.....10.....8.....12.....10**

b) **Vou.....8.....12.....10.....12.....8.....12.....10**

Konstantinos identifies Maqam Rast with Tone Plagal IV, and analyses its scale as follows:

Ke.....12...4.....12.....9.....7.....12.....12

Signell records the intervals of Rast as:

G.....9.....8....5.....9.....9.....8....5

The accepted structure of the scale of Tone VIII is

Ni.....12.....10.....8.....12.....12.....10.....8

If we transpose the scale Signell gives for Rast a fifth lower we get the following scale

Ni.....9.....8....5.....9.....9.....8....5

This does not correspond exactly to the psaltic scale, but is very close in pattern. Indeed if we multiply the values of intervals in the psaltic scale by .75 we get a scale of

Ni.....9.....7.5.....6.....9.....9.....7.5.....6

which is as close to Signell's version of Rast as one could hope given the fact that one model is originally based on 72 and the other on 53 steplets to the octave. What then of the Archcantor's version of Rast? His analysis begins on Ke rather than Di

Ke.....12...4.....12.....9.....7.....12.....12

To make Konstantinos's transcription comparable to Signell's we need to begin the scale at Ni rather than Ke:

Ni.....12.....9.....7.....12.....12.....12...4

This scale differs from the one given by Signell mainly in the intervals between Ke and Zo and Zo and Ni: Zo is sharper in Konstantinos's analysis.

These interesting examples may be enough to suggest that the precise tuning of the psaltic scales is not quite so cut and dried a matter as the consensus of modern theorists can all too easily suggest.