Homeric Recitation, with Input from Phonology and Philology[*]

Avery D Andrews, ANU, June 2006

1. Introduction.
It is widely assumed that the *aoidoi*, the original performers of Homeric poetry or its antecedents, sang a chant restricted to three or four notes, to the accompaniment of a 4-stringed instrument (Danek and Hagel 1995, Marshall 2002). The prestigious later performers from Classical times, the rhapsodes, didn't have the instrument, and the vocal characteristics of their performances are quite uncertain.   In this paper I will discuss various aspects of a conjectured rhapsodic style, based on the reconstruction of the Ancient Greek pitch accent by Devine and Stephens (1994), together with some consideration of issues concerning the hexameter rhythm.   For some initial orientation, it might be useful to listen to the short sample on the CD accompanying this issue; various features of the style will be discussed with reference to that. The main proposals of the paper are first, that the melodic contours of the line were more complex than is consistent with a restricted chant, and second, that there was line-internal 'extra time' (mostly at the traditional caesuras), and even actual pauses within the line.

That the *aoidoi* performed to a chant with relatively few notes, most likely three or four, is indicated by the facts that a) there are four strings on the lyre b) cognate performances such as the Vedas are performed to a restricted chant c) homologous performances such as those of the South Slavic guslars and many others around the world are also performed to a restricted chant. Rhapsodic performances on the other hand were clearly quite dynamic (big-time entertainment in a Mediterranean country), and were capable of getting crowds worked up in a way that it is not easy to imagine being achieved by a Vedic or guslar-style restricted chant, as indicated in by this quote from Plato's Ion:

> For I tell will you without reserve: when I relate a tale of woe, my
> eyes fill with tears; and when it is of fear or awe, my hair stands on
> end with terror, and my heart leaps …
>
> For I have to pay the closest attention to them [the audience]; since,
> if I set them crying, I shall laugh myself because of the money I take,
> but if they laugh, I myself shall cry because of the money I lose.
>
> (Plato's `Ion' 535C,E).

I suggest that the rhapsodes discovered that they could produce a more dynamic and exciting performance by discarding the instrument and abandoning the restricted chant for a freer format, an artistic enhancement of the melodic patterns of ordinary speech.

This idea would not be very useful if we couldn't get any information about what the intonation patterns of Greek speech were, but, fortunately, this is not the case: linguistic theory can suggest some hypotheses, which philological work (primarily the investigation of the relationship between the texts and the tunes of the Delphic

1

Hymns) can corroborate. This certainly doesn't answer every question that one might have, but it does provide a reasonable basis for a hypothetical performance.

The rhythm is perhaps surprisingly more problematic: good arguments have been made by Daitz (1991), Danek and Hagel (1995) and others that there were pauses between lines, even in cases of enjambment, but the issue of line internal pauses is more difficult. Traditionally, many people have assumed that there were mid-line pauses, especially at important syntactic boundaries, such as between clauses (Hardie 1920), but arguments against this have also been made: for example, recently by both Daitz and Danek and Hagel in the works cited just above. On the other hand there is also a perception that midline pauses are needed to provide sufficient expressiveness in the rhythm (Wyatt 1992, Kahane 1994).   A complicating factor is that the subjective effect of a pause can be produced by prolongation of a syllable prior to the perceived pause-location (Selkirk 1984), so that there are really two questions to consider: a) were the dactylic ictuses equally spaced, or was there a certain amount of extra time allocated within the line b) in the latter case, could this extra time be occupied by silence (a true pause). This performance style utilizes extra time and line-internal pauses, and an argument that these may have existed will be presented (due originally to Drewitt 1911), and some objections defused.

In the next two sections I will first discuss the pitch contours, and then the rhythms, referring to the audio on the CD to illustrate various points. I will conclude with some general remarks about how the putative features of the rhapsodic style might have developed.

2: Pitch Contours.
The main classical evidence concerning pitch contours in Ancient Greek is a somewhat enigmatic passage by Dionysius of Halicarnassus (*De Compositione Verborum* 76.13, Usher 1985), the clearest consequence of which is that in an isolated word, the interval between the high pitch (acute accent) and a low pitch was about a fifth. Bouncing back and forth across such an interval does not provide a very promising basis for producing the effects sought by Ion, and Dionysius furthermore does not tell us anything about the grave accent, or what happens to the pitches when words are put together into phrases. But it turns out that linguistic research can support some hypotheses about the latter, which philological investigations can corroborate and supplement with further information.

There are two main contributions from linguistics. The first is the information that in pitch systems it is not usually the case that either the rise to the high pitch or the fall from it is abrupt; rather it is spread out over a number of syllables. This phenomenon was noticed by the linguists of South Asian antiquity, who notated it in their transcriptions of the Vedas, and called it 'svarita' (Allen 1973:233-234). The second is a phenomenon called catathesis, first described for Tokyo Japanese by Poser (1982), and then investigated in a number of additional languages by Pierrehumbert and Beckman (1988). Catathesis is the phenomenon whereby, within a phonological phrase, the occurrence of a high pitch causes the height of following high pitches to be reduced, and the dynamic range of the pitch variations to contract.[1] The effect is that if there are two words with acute or circumflex accents that form a grammatical/semantic unit, the high pitch component of the first is expected to be realized as a higher pitch than that of the second, and similarly with a sequence of

three, such as, for example, πολυφαρμάκου ἐς μέγα δῶμα in the short sample. Svarita and catathesis thus provide a basis for putting more notes into the pitch contour, but of course it doesn't necessarily follow that these would have worked in Greek exactly as they do in Tokyo Japanese, etc., and the problem remains of what to do about the grave accent.

Investigating the correlations between the tunes and the accentuation of the texts of the Delphic Hymns provides a considerable amount of the desired evidence. In the first place it is a widespread, although not absolutely universal phenomenon, that in languages with phonemic pitch, the tunes of songs are set consistently with the linguistically required pitches: if some syllable of the word is supposed to be higher pitched than others in speech, it will normally have a maximally high note in the tune (at least as high as all the others). This regularity is observed for the acute accent in the hymns, and the circumflex is frequently set to a falling melism, supporting the idea that Greek musical settings are indeed in conformity with the pitch accent. With further investigations one can thus draw conclusions about the grave, catathesis, and various additional issues.

The implementation of the pitch phenomena argued for by Devine and Stephens can be shown not only with audio files, but also with some graphs produced by the phonetic analysis program Praat, by Paul Boersma and David Weenink, available from http://www.praat.org . This provides some assurance that the phenomena subjectively attributed to the style are actually occurring in the performance.

2.1. Effects Triggered by Non-accentual Environments: In the first place there are various inherently non-accentual phenomena that can affect pitch, of which Devine and Stephens investigated three (D&S:172-180): vowel quality, voicing of neighboring consonants, and aspiration of a preceeding consonant. The one effect of this nature that was found is that aspiration before a pretonic vowel tends to raise its pitch somewhat: in a word such as φιλόμαχον, there will tend to be less of a rise from the ι to the following ο than would be the case if the preceeding consonant were not an aspirate. No attempt to implement this effect is made in this performance style.

2.2 Word Melody: The basic word-melody is found to be Mid-Hi-Lo. That is, the pitch level is higher before the acute or circumflex accent than after it. This is illustrated in the following diagram, produced by Praat:
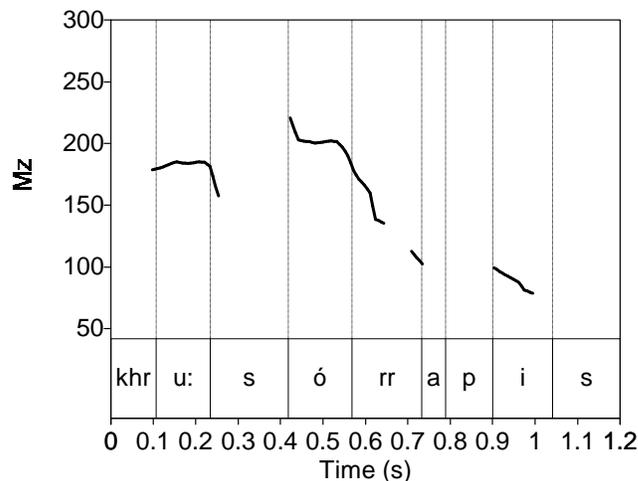
Figure 1: Word Melody (khrusorrapis.wav)

In this figure, the curved line in the upper portion of the diagram represents the pitch contour of the word, as extracted by Praat from the file **khrusorrapis.wav** in the Data section of the CD. Notice that the program doesn't manage to extract a pitch for the unstressed vowel /a/, but does register a steep fall in pitch during the double-length (mora-bearing) consonant /rr/. There is also an erroneous detection of a high pitch over the initial consonant cluster; the pitch-extraction algorithms are not foolproof. There are also steep falls before and after the first [s]; these are side-effects of consonantal articulation, and not perceived as pitch.

2.3 The Grave: The grave works out to involve a rise, but less of one than an acute, and, importantly, no following fall (D&S:180-183). Figure 2 illustrates the grave in the phrase ἠδὲ θαλάσσης, where there is a rise to the grave, but this is lower than the following acute:
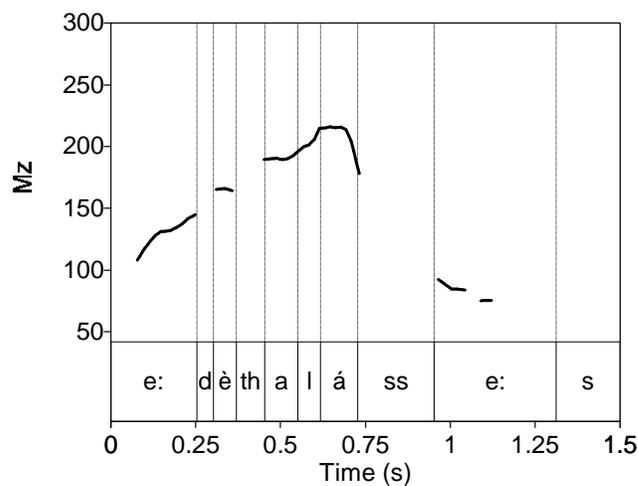

Figure 2: The Grave (edethalasses.wav)

4

2.3. Catathesis: Catathesis is the already-mentioned phenomenon whereby in a phonological phrase the occurrence of a high pitch causes the following pitches to be lower, and the dynamic range to contract.   Devine and Stephens (pp. 403-408) find catathesis occurring in both larger phonological phrases (major phrases, corresponding roughly to clauses or 'lines' (stichoi), including those with nonfinite verbs), and smaller ones (minor phrases, which are two or three words occurring closely bound together, such as a noun and adjective, or verb and proceeding object, often constituting half-lines or 'cola'[2]). At the beginning of each minor phrase is a pitch-boost, so the effect is that of a local downtrend in the minor phrase, superimposed on a larger, long-term downtrend in the major phrase.   There are important effects tending to cancel catathesis, as we shall see shortly, leading to the result that there are relatively few lines where catathesis might be found across a whole line (*Od*.2.39 is one example), as well as in the half-lines (presumed minor phrases), but my spontaneous performance of this and other such lines doesn't seem to show the effect.

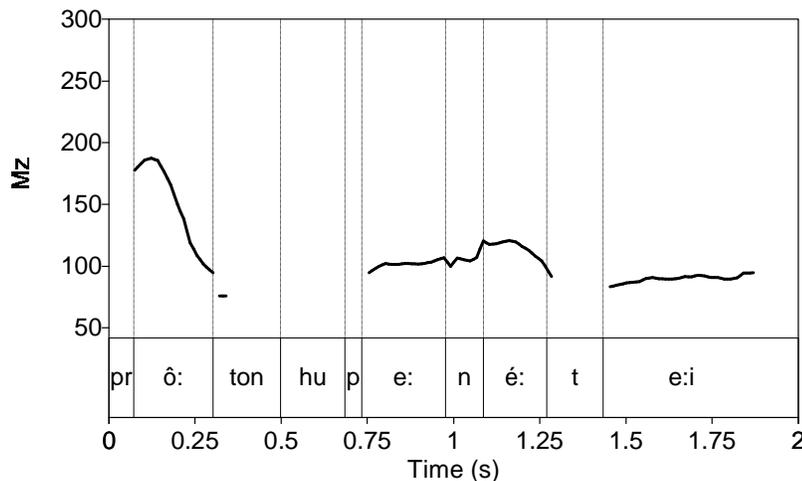In the minor phrase, catathesis is easy to illustrate, as in figure 3:

Figure 3: Catathesis (proton_hypenetei.wav)

Observe the steeply falling accent on the *ô:* in the first word, and the much more modest rise to the acute of the second word.

There are a number of important further features of catathesis in Greek (the process exists in many if not all languages, but details differ from language to language). One is that it only seems to be triggered by high pitches in lexical, or 'content' words (nouns, adjectives, verbs, and many adverbs, especially those based on stems of other kinds of lexical words), not in 'grammatical' or 'function' words such articles, demonstratives, conjunctions and particles. (D&S:261). Another is that its effects can be cancelled by pragmatic factors such as topic and focus: elements which are for some reason prominent can have a higher pitch than would be expected purely on the basis of the catathesis principle (D&S:479-80).

2.4. The Grave and Anathesis: Perhaps the most significant further fact about the grave is that it appears not only to cancel catathesis, but to actually reverse it (D&S:445-449), an effect which I call 'anathesis'. A particularly interesting consequence is that if there is a series of graves, we should expect there to be a sort of 'terracing' effect, a progressive rise up to the final acute or circumflex. Devine and Stephens don't have extensive discussion of this, but they observe (D&S:363) that a sequence of graves on lexical words tends to have an upward trajectory, while a sequence of graves on grammatical words tends to be covered by a pitch plateau, although a shallow rise is also possible (D&S:374). But a full-scale statistical analysis is not presented. Regardless of its authenticity, 'terracing' seems to be a fairly satisfying effect in performance, illustrated below for the phrase *ἰὼν ἱερὰς ἀνὰ βήσσας.*
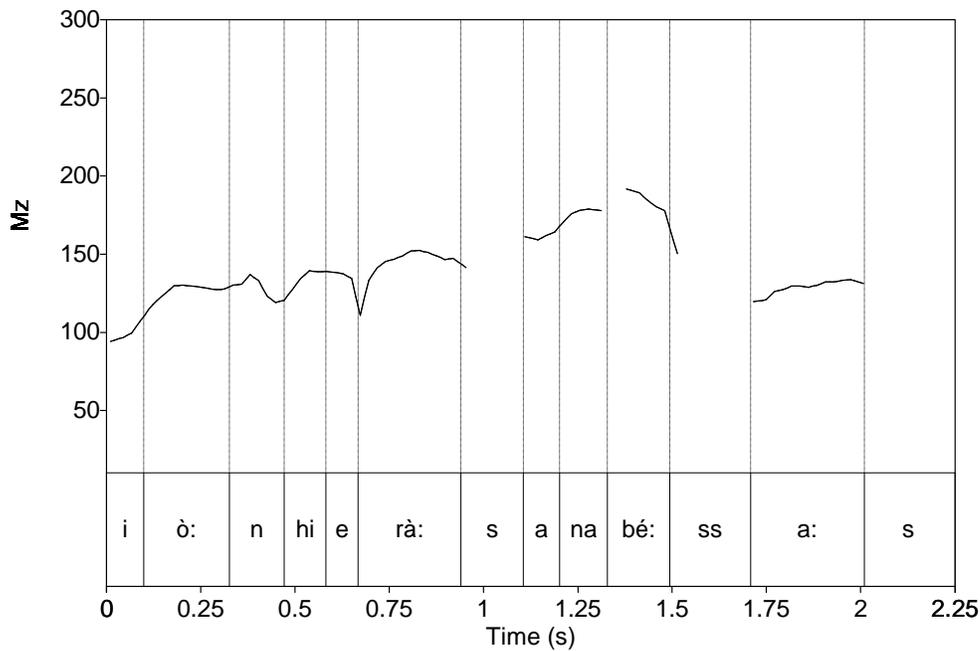

Figure 4: 'Terracing' (in a half line, l275_half2.wav)

2.5 Secondary Rise: The final effect I will discuss is one called 'secondary rise' (pp. 189-191). Seconary rise lifts the pitch of the final syllable of a word preceeding a word whose first syllable bears a high pitch. Intuitively, it has the effect of making the words it applies between seem to cohere better into a single unit, an effect which is quite unsurprising, since it can be regarded as a spreading of the rise on the high pitch of the initial syllable of the second word into the end of the first. My original version of the recitation technique didn't have secondary rise, and incorporating it seemed like a definite improvement. It is illustrated in the sound file **domatakirkes.wav**.

2.6. Conclusion: I have now discussed the major findings of Devine and Stephens as they bear on the performance technique discussed here. A graph of a complete line from the short sample (*Od*.10.275) with its pitch contour is given in Figure 9 in section 3.2, below. An important potential source of error for this style is that it is

based on the reconstructed pitch system of Greek at the time the Delphic Hymns were composed, about 130BC. The original Homeric pitch contours, to the extent that they were based on the spoken language at all, would have been based on the language as it was at least 400 years previously, and very likely much older. And the evidence that can be gleaned only specifies the locations and directions of changes in pitch, not the absolute notes employed. Nevertheless, I think the performance can be taken as a somewhat motivated approximation to what the originals might have been (although, in terms of quality, rather in the way that someone singing in the shower is an approximation to a professional opera singer).

Another issue that is worth mentioning is that the rather sporadic accentuation of the papyri is not always in apparent agreement with these principles. The general idea seems to be that what is marked is usually the pitch peak of a group of words (Nagy 2000a). This works well for many of the cola in the Bacchylides Papyri, as in (75.7; Nagy 2000a:26):

<div align="center">ψυχὰ προφάνη Μελεάγρου</div>

which comes out as:

<div align="center">ψυχαπροφάνημελεαγρου</div>

By anathesis, the accent on προφάνη is higher than that on ψυχὰ, and by catathesis, this same accent is higher than the one on Μελεάγρου, and is therefore the one that is marked. But these expectations aren't always satsified. Here is an example presented in Nagy (1996:126-7; 2000:15), in *Od.*22.184:

<div align="center">τῆ δ᾽ ετέρη σάκος ευρὺ γέρον πεπαλάγμενον ἄζη</div>

The first part of the line comes out *Pap. Ox.* III 448 as:

<div align="center">τηιδ᾽ ετερηισακοσευρύγερον</div>

with the final acute on ευρὺ being marked as the peak, rather than the penultimate one on γέρον. It is probably not worth spending much time in speculation about what is going on here before doing a more systematic investigation, but one possibility is that anathesis is being overridden in order to get a longer falling cadence at the end of the minor phrase, since on syntactic grounds this line is a good candidate for having its main phrasing break at position 8.

A final point, which I believe is very important for appreciation of the sound of the poems, is that if you can dissociate pitch from the other components of English 'stress' (length and loudness), you become much more sensitive to the quantitative rhythm, which enhances perception of the poetic form. Therefore, even if the performance style is quite wrong in detail, it isn't completely useless, since it can serve as a model to help people achieve this change in perception.

3. Rhythm:
The next aspect of the proposed style to consider is rhythm. Here the central issue is whether or not the ictus beats should be regularly spaced in time within the line, and,

if not, whether there should be mid-line pauses at the standard caesura and diaresis locations, and perhaps occasionally elsewhere. The present style does have pauses, and more significantly, unequal spacing of ictus beats, so we will go to some lengths to make a case that these were plausible. However the justification involves substantial technicalities, so readers who get bogged down may wish to skip ahead to section 3.2, where the consequences for performance are discussed.

3.1 Analysis:

This issue of midline pauses has a difficult recent history. Prior to the beginnings of attempts in the early and mid 20th century to explain Greek meter in terms of (structuralist) linguistics, people seem to have assumed that there would be pauses, or 'rests' between clauses and at various other significant syntactic boundaries, especially when they occurred at the obligatory caesura locations, and sometimes elsewhere (cf. Hardie 1920). But if, for example, you follow Sturtevant (1921, 1924) in trying to explicate metrical length in terms of (surface) phonetic syllable structure, a severe difficulty arises, in connection with sequences of the form VC⏐V (the bar representing a pause), and VC⏐C. The difficulty is that in the first case, the first vowel will (normally) scan as short, while in the second case it scans as long. But because of the pause, in both cases the first syllable will have the same overall structure, so it should be metrically long (if a C before a pause counts), or metrically short (if a C before a pause doesn't count). What comes after the pause shouldn't make any difference, but it does. A straightforward solution (the one proposed by Sturtevant) is to deny that the postulated pauses existed.

I don't think that the issue can be resolved conclusively, but there are two further considerations to bring to bear. The first is that a 'naturalistic' performance, with pauses in the sorts of places where they would occur in speech, seems more consistent both with the kinds of expressive effects that the rhapsodes appear to have attained, and with the 'enhanced naturalism' (like nature, but a bit better) that Greek esthetic taste appears to have favoured. Secondly, modern linguistics provides ideas that can be used to reconcile the contradictions between the apparent evidence for pauses and that against them.

Since the ideas and arguments depend on technicalities of metrical theory as well as linguistics, I will begin with a quick review of the structure of the dactylic hexameter, introducing some aspects of contemporary linguistic analyses at the same time. The dactylic hexameter consists of six repeated units called 'feet', the first five of either the form — ∪∪ (dactyl), or —— (spondee), where — represents a 'long' vowel or syllable, and ∪ a 'short' one, and the last foot is either a spondee or of the form — ∪ (trochee). What this 'length' really is, and whether it applies to vowels or syllables is one of the many points of difference between the various treatments that have been proposed.

As a first approximation one can say that a vowel that is naturally long, or a diphthong, can be expected to be metrically long (with certain exceptions), and that when a short vowel is followed in the same syllable by a consonant, the vowel/syllable is also metrically long ('by position' rather than 'by nature'). Since metrical length is not necessarily the same thing as phonetic length, the term 'heavy' is often used for metrically long vowels/syllables, 'light' for short ones. It is generally accepted that the foot divides into two half-feet ('hemimerals'), so that the

first half-foot will always consist of a heavy syllable, and the second either of one heavy or two lights, except in the last foot, where the second half-foot is one unit, either heavy or light. There is a rather lush system of traditional terminology for the metrical positions in the line (hephthemimeral, etc.), which has largely been replaced by the rationalistic numbering system of O'Neill (1942), in which the positions after the half-feet are numbered consecutively from 1 to 12, and the positions between two shorts are indicated with '.5' after the number of the previous half-foot. E.g, the position after $\cup$ in the third foot would be numbered 5.5 (traditionally third foot trochaic, or tritotrochaic).

On top of the barebones account of the hexameter as a sequence of dactyls and spondees there are many known further regularities, ranging from almost exceptionless laws to mere tendencies, governing where word-boundaries tend to appear, and words of various shapes tend to be located, and other features such as the distribution of dactyls vs. spondees; see van Raalte (1986), Bakker (1988) and Kahane (1994) for recent discussion and extensive bibliography. Perhaps the most important is that almost all (in Homer, 98.8%) of lines have a word break in the third foot, either at position 5.5 (the most common) or position 5. This is also a favored position for a major syntactic boundary, such as between clauses, so it is clear that there is usually a significant division in the line at one or the other of these positions, which are among what are sometimes called the 'obligatory caesuras'. There are 333[3] lines without a word-break in one of these two locations, but they all arguably have a break in the middle of the fourth foot (position 7). 'Arguable' because in some cases (*Il*.23.159, *Od*.8.175) the required break is between a verbal particle and the verb, where some editors don't put in a word-boundary. On this basis it is common but not universal to admit position 7 as a third possible location for the obligatory caesura.

Other popular locations for word-end and syntactic boundaries are positions 3 and post-dactylic 8 (bucolic diaresis), and these are sometimes counted amongst the major caesura positions. But there are 53 lines with word breaks neither in the third foot nor position 3, and 200 with word breaks neither in the third foot nor post-dactylic position 8.[4] These positions therefore would seem to have much less of a claim to being alternative sites for an obligatory caesura.

The issue of midline pauses thus most often appears as the question of whether one should pause at (at least some of) the major obligatory caesura locations (positions 5, 5.5 and 7), and perhaps at major syntactic boundaries at other locations where editors often install punctuation (especially positions 3 and 8). Many classicists have assumed that pause was appropriate in such positions (e.g., Drewitt 1908, Hardie 1920), but, as mentioned above, the attempt to explicate meter in terms of phonetics creates difficulties with this. A variety of positions and arguments about midline pauses up to the early 1970s are summarized by Allen (1973), and some more recent advocacy against pausing has been formulated by Daitz (1991, 1992) and Danek and Hagel (1995), and for it by Wyatt (1992) and Kahane (1994). But before making a case for the possibility of mid-line pauses, there are two sub-issues to consider.

First is the matter of 'sense pauses'. These are what in modern linguistic terminology would be called 'syntactic boundaries', e.g., between two clauses, a verb and a following complement or other subordinate clause, etc. Syntactic boundaries are related to pauses by the fact that in ordinary speech they are possible (but usually not

necessary) locations for pauses, and other forms of phrasing in performance. Many syntactic boundaries are likely locations for an editor to install some punctuation, but since pausing at syntactic boundaries is usually optional, it does not automatically follow that one should pause at punctuation in a Homeric line. Another significant point is that syntactic boundaries are of various strengths, and the greater the strength, the more likely a pause. In speech, for example, a pause is more likely at the boundary between two clauses than between a subject and following verb phrase.

Kahane (1994) uses a variety of indications, such as where editors have installed punctuation, and where various scholars have located major sense-breaks, to identify the most frequent locations for major syntactic boundaries (such as between clauses). While each of these indications is subjective, and would not be convincing on its own, the fact that they are all in rough agreement indicates that they are reliable indicators of the syntactic structure of the text. The three most frequents locations for syntactic boundaries are, in order, 5.5, 8 and 5. Interestingly, position 7, the obligatory location for word-break when none appears in the third foot, comes in rather low as seventh in the ranking as a favoured location for major syntactic boundaries, but, as we shall see, it does better when no word-break appears in the third foot.

The second issue is that pauses are a special case of a more general phenomenon, which might be called 'extra time', which may added to the end of a constituent at a syntactic boundary. Extra time can be filled in two ways, either by silence (pause), or be prolonging material at the end of the constituent. Under many circumstances, pausing and prolongation are functional equivalents, and prolongation can be perceived as pause (Selkirk 1984:305-313). This is an important point for at least two reasons: first, because the evidence for extra time is more convincing than for pause as such, and second, because the availability of prolongation as an alternative to pause for implementing extra time provides a plausible account of cases which would otherwise be rather embarrassing, such as elision across major caesural boundaries.

With this background, we look first at the arguments of Daitz (1991) against line-internal pause (in most of the places where it is traditionally recognized). There are three of these. The first (D:153) is based on an interpretation of how the meter works. The idea is that since the rhythm is 'dependent for its effect on the patterned duration of long and short syllables', an internal pause after a short syllable 'will in effect render the short syllable long, and thereby dislocate the rhythm.' This may be true, but the argument is based on assumptions that are not necessarily the case, and also involves a certain degree of unclarity as to what would actually be producing the problems occasioned by pauses. One possibility is that the rhythm may have been based on the temporal separations between short and long syllables, which pauses would alter. Such an interpretation is suggested by the fact that Daitz likens the poetic meter to the rhythm of sung music. But there are two problems with this. First, if extra time were deployed in some consistent pattern, it would indeed affect the rhythm, but not necessarily disrupt it, its disposition being part of the pattern. Second, prolongation (rallentando) is suggested as an alternative implementation to pause for syntactic boundaries (D:156). But prolongation would be just as potentially disruptive to temporal spacing as pauses. Another possibility is that the silence of a pause might be necessarily parsed with a preceding short syllable so as to make it long. This certainly is a possibility, but we can't assume that it was necessarily the

case. A sounded out short syllable is quite different from a period of silence, and it is quite possible that actual sounds were accounted for differently from silence.

The second argument (D:153-154) is based on observations by Cicero and Quintilian on the effects of pauses in various contexts, such as that if a certain orator had not paused in a certain place shortly before the end of a period, he would have produced a senarius (Cicero *Or* 6.222). These are interesting and significant, but it is not clear how much weight should be assigned to them, since the sources are not specifically discussing the hexameter, nor indeed any other poetic genre in a systematic way.

The final argument is based on the distribution of elision and 'Epic correption' (D:155-156), the phenomenon whereby a naturally long vowel can be treated as short if it precedes another vowel. These phenomena sometimes occur at major syntactic boundaries at an obligatory caesura, or other locations where editors have installed punctuation. Daitz's claim is that one should not pause at these locations because the extra time spent on the pause would undo the temporal effect of the elision or correption. This could well be the case, *if* temporal spacing of the ictus beats is what matters to the meter. But in fact we don't know that this is so; therefore this argument faces the same problem as the first. There is a further issue with these arguments, which depends on the fact that, in general, prolongation is an alternative to pause as an implementation of extra time. It follows that if we observe elision, which is indeed prima facie likely to be inhibited by pause, occurring across an obligatory caesura position and major syntactic boundary, that might simply indicate that this is a location where prolongation (rallentando) should be used, without implying that pause would be impossible where elision doesn't occur.

I conclude that Daitz doesn't make a convincing case that midline pause is impossible. It is also unclear whether his arguments should or should not apply against the implementation of syntactic boundaries by prolongation. Wyatt (1992) and Kahane (1994) also reply to Daitz, but do not seem to me to offer a systematic critique of his actual arguments (although Wyatt does note an apparent contradiction in Daitz's footnote 10), nor make a systematic counter-case for midline pauses.

Kahane (1994:17-18) does, however, make an interesting case that pausing can add a lot to the performance of certain passages, such as Od.6.130-2, which describe the movement of a lion, and where frequent pauses do indeed give a strong suggestion of cat-rhythm. Nonetheless, I don't think that a general conclusion can be drawn from the existence of a few cases of this nature, and Kahane doesn't consider the possibility of using prolongation instead of actual pause. But a more general and, I think, fundamentally much more important point made by Kahane still stands: a flexible rhythm, with scope for pausing and prolongation, seems to be far more esthetically satisifying than a rigid one with equally spaced ictus beats. This seems to me to be a pervasive property of the poems, and therefore quite unlikely to an accident.

Danek and Hagel (1995) make a case against line-internal pauses on the basis of what happens with sequences such as VC|V where the first V is short, and '|' represents a pause (essentially, Sturtevant's argument). If metrical weight is based on actual, performed syllable structure, and a syllable-final consonant is what causes 'length by position', it follows that the first syllable would come up heavy rather than light in the above configuration; to avoid this it would be necessary to eliminate the pause and

resyllabify the C as onset of the following syllable rather than coda of the first. This configuration is furthermore quite common, including at the most likely pause sites, such as major syntactic boundaries at position 5.5. Therefore if the meter is indeed based solely on overt syllable structure, midline pauses are excluded.

It is known, however, that metrical patterns do not have to be based directly on overt phonetics or phonology, but can be somewhat abstract. For example Anderson (1973) shows how rhymes in Modern Icelandic poetry are based on a somewhat abstract analysis of the vowel system, arising through historical changes, rather than on the overt phonetics. Furthermore there are various possibilities for the determination of metrical weight from syllable structure. For example Bolling (1913:160) suggests that prepausal consonants are ignored, although he does note the resulting question of why sequences of the form VC|CV then never have the first syllable light (he suggests that there was an 'artificiality of technique' whereby such scansions were avoided). A refinement of Bolling's suggestion that avoids the non-occurring scansions is that word-final C could simply be ignored for the purposes of calculating metrical weight, when followed by a V, regardless of intervening pauses. So there are possibilities for pauses, although we certainly need some more evidence and argument before advocating them. A final point that is worth making is that Danek and Hagel do not make a case against a prolongational implementation of extra time, and indeed at one point recommend it, although only in 'tiny' (*winzige*) amounts, and don't have it audible in their performance.

So now we start developing a case for extra time, and a weaker one for pauses. The first thing to consider is the significance of the caesuras, in foot 3 and 4. The fact that there is always a word-break in one of these three positions indicates that there was some special requirement associated with them, but it seems rather unlikely that this was simply a requirement for a word-boundary as such, a point corroborated by Kahane's (1994:27-28) observation that the third-foot caesuras are also especially frequent locations for a major syntactic boundary. The low frequency of such boundaries at position 7 might be seen as a problem for this, but if we consider only lines without a word-break in the third foot, the frequency of major syntactic boundaries at position 7 increases significantly. For example finite clause boundaries are located at 16% of the position 7 breaks in the lines of the *Iliad* and *Odyssey* with no third-foot break, but only at 5% of position 7 breaks in a 335 line random sample chosen from lines of the *Iliad* and *Odyssey* that do have a break within in the third foot, a highly significant difference.

The conclusion I would draw from this difference is that the interior of the third foot was a favored location for some feature of the performance that correlated naturally with major syntactic boundaries, and required a word-break, and that position 7 in the fourth foot was a less frequent alternative for this feature (whose characteristics seem, however, to have been enforced somewhat more aggressively in this position than in the usual third-foot one). This feature would presumably have been the performance equivalent of some kind of phonological phrase, whose boundaries in natural speech are indicated by combined effects of stress, pitch and timing (prolongation and pause). Danek and Hagel (1995) for example argue that a falling pitch contour was the main delimiter of this phonological phrase; I will be arguing that extra time and, indeed, actual pause were also involved.

The argument is based on points made by Drewitt (1908), who investigated the distribution of phenomena such as overlength (more material than is required to secure metrical length), elision and 'dovetail scansion' (a word-final short vowel rendered metrically heavy by a consonant cluster at the beginning the next word) at word-end at the various locations in the hexameter. Drewitt's counts were based on the *Iliad* with certain omissions (2:484-end, 8-10, 23, 24), apparently motivated by theories of the relative ages of different parts of the *Iliad* which we would not necessarily want to rely on today.

Desiring to have figures for the whole *Iliad* as well as *Odyssey*, I made a scanned text of both poems by downloading the Greek text from the Perseus Project (www.perseus.com) and scanning it with an interactive computer program (written in Amzi Prolog and C++).[5] The program displays putative scansions in accordance with a body of scansion rules, and the user picks the first one that he or she judges to be correct. Illustration 1 is a sample screenshot, illustrating the format in which lines and scansion are presented. This format was chosen to make it as easy as practically possible to detect metrical features of lines.
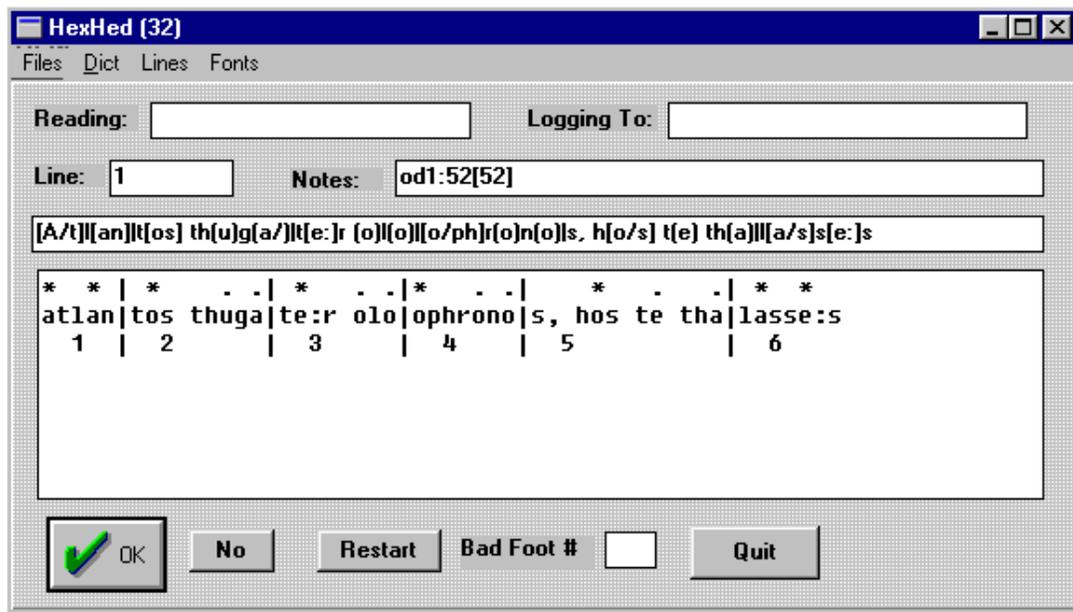

Illustration 1: screenshot of interactive scanning program

In addition to indications of metrical structure, the program also supplies a representation of inferred vowel length for /a/, /i/, /u/, maintaining a dictionary recording the user's choices. The scanned corpus can then be processed by other programs which look for patterns of various kinds. An important topic on which more needs to be done is assessing how accurate the scansion is. Preliminary indications are that the error-rate is in the vicinity of 1 in 300 lines, but assessing it accurately is difficult.

Moving on from the methods to their results, the most immediately telling observations are of overlength. These show a very distinct tendency to cluster in position 5. Drewitt makes distinctions between 'tomic' and 'semitomic' breaks, the

latter being those separating a word from an associated enclitic or proclitic, and between speech and narrative. For comparison with my own counts, I have aggregated all of these categories and taken percentages. Drewitt also distinguishes what we might call 'strong' overlength, where a long vowel is followed by a (metrically) syllable-closing consonant in its own word, that is a configuration of the form VVC#C ('#' representing word-break). Aggregating these figures and taking percentages, we get the following results:

position:	3	5	7	9
# breaks	4706	4872	4316	2071
% overlen	21.3	30.4	19.7	7.9
%str overlen	11.2	22.9	12.3	4.8

Table 1: Overlength at hemimerals according to Drewitt (1908)

The strong overlengths are almost twice as common in position 5 as in the next-most common 7, and overlengths in general are also more popular there. The most natural interpretation of this is that there was indeed extra time to be spent at that position of the line. On these figures, position 7 doesn't stand out as particularly rich in overlengths, but Drewitt tells us that among the narrative lines whose major break clearly occurs in position 7 in this portion of the *Iliad*, 39% have overlength there. It is unfortunately not clear what criteria Drewitt used to judge the location of the major break, so I investigated matters with the scanned corpus. Looking at the same parts of the *Iliad*, I find somewhat different numbers of breaks and percentages, for reasons that I do not at present understand, but position 5 remains the clear winner as favoured position for overlength:

position	1	3	5	7	9
#breaks:	4343	7242	5848	5549	3433
% overlen	16.0.0	18.8	27.4	17.2	8.9
% str. overlen	13.7	10.7	21.2	11.5	6.5

Table 2: Overlength at hemimerals in Drewitt's portion of the *Iliad*, my count.

Looking at lines without a third foot break (151 in this portion of the *Iliad*), we see that overlength then does congregate at position 7, although there is not such a preponderance of strong overlength there:

position:	1	3	5	7	9
#breaks:	34	130	0	154	40
%overlen	11.8	20.0	NA	31.8	20.0
% str.overlen	11.8	17.7	NA	23.4	17.5

Table 3: Overlength at hemimerals without 3rd foot caesura, Drewitt's portion of the *Iliad*, my count

Looking at all of both poems doesn't alter the main result, although the proportions and some of the other rankings change:

positions	1	3	5	7	9

#breaks	10693	17049	14002	13387	8107
%overlen	15.0	18.2	25.8	17.5	10.1
%str. Overlen	12.8	10.6	19.3	11.5	7.2

Table 4: Overlength at hemimerals in *Iliad* and *Odyssey*, my count.

position:	1	3	5	7	9
#breaks:	92	279	0	333	89
%overlen	9.8	16.1	NA	32.1	19.1
% str.overlen	8.7	14.3	NA	22.2	16.9

Table 5: Overlength at hemimerals in lines without 3rd foot caesura, *Iliad* and *Odyssey*, my count

The distribution of overlengths thus provides evidence that each line had an allotment of 'extra time' that was normally spent on the third foot caesura, but could be spent instead on the fourth. Devine and Stephens (1994:401-402) provide some additional corroboration of this idea for the pentameter.

So we have a case for extra time, but was this ever implemented as pause, as opposed to only prolongation? To begin making a case for the former, we start by looking at the distribution of some additional phenomena, in particular 'dovetail scansions' (V|CC, where V scans as heavy due to the consonant cluster at the start of the following word), elision, vowel shortening (epic correption), and what I'll call 'metrical resyllabification', the process whereby VC|V scans the first V as light. For the hemimeral caesuras, the latter two are not relevant, so we look at only the first two. Amongst the elisions we also distinguish a subcategory of 'strong' elisions, where the elided vowel belongs to a lexical stem rather than a following particle (as for example in τὸν δ᾽αὖτε):

positions	1	3	5	7	9	11
#breaks:	10693	17049	14002	13387	8107	1050
%dovetails	0.6	10.7	3.2	17.5	5.3	18.1
%elision	35.9	13.8	3.8	7.5	15.5	0.2
% str.elision	15.7	5.8	2.6	1.1	10.6	0.2

Table 6: Hemimeral phenomena, *Iliad* and *Odyssey*, my counts

What we observe is that there are very substantial reductions in both dovetail scansions and elision at position 5, as would be expected from the presence of a major boundary here. I've included data from position 11, where elision is also very rare, presumably for reasons of vocabulary structure; note that dovetails are also very rare in position 1, presumably for the same reason. Position 7 is rather well-supplied with dovetails, and elision isn't immensely rare there either, but both of these become quite unusual at position 7 when there is no third-foot break:

positions	1	3	5	7	9	11
#breaks	92	279	0	333	89	21
%dovetails	2.2	2.5	NA	0.3	5.6	4.8
%elision	25	16.5	NA	0.3	9	0
%str. elision	14.1	3.9	NA	0	2.2	0

The number of dovetails and elisions at position 7 falls almost to zero (one of each, *Od*.6.326 and *Od*.24.244), indicating that whatever is suppressing them at position 5 is applying with even greater stringency at 7 when there is no break at 5 or 5.5.

The 'shortening' phenomena, epic correption and metrical resyllabification, are only relevant after light syllables, and while elision can also occur there, dovetails do not:

position	1.5	3.5	5.5	7.5	9.5
# breaks	8258	4435	16788	1298	13627
%elision	17.5	15.6	4.0	6.6	9.0
%str. elision	11.3	11.4	2.6	4.4	7.1
%met. resyll.	39.0	36.0	34.8	7.7	43.3
%epic correp.	9.7	6.3	7.3	9.6	4.9

Table 8: Phenomena at 'trochaic' breaks, *Iliad* and *Odyssey*, my counts

Elision is strongly suppressed at 5.5 (but it is also low at subsequent breaks). By contrast, metrical resyllabification and epic correption seem to be unaffected at this position. This is a significant discrepancy which we will be trying to account for. However, there are still a considerable number of examples of elision across 5.5. If one looks at these, it is clear that many of them involve prepositions, occurring in lines where the main caesura is clearly located at 5 or 7. If we look at lines without breaks at 5 or 7, where 5.5 must be the obligatory caesura, elision there is further reduced, but not eliminated:

position	1.5	3.5	5.5	7.5	9.5
#breaks	1880	1455	7456	259	3260
%elision	14.8	19.2	2.6	3.1	9.3
%elision	9.5	14.8	2.1	0.4	7.1
%met.resyll.	37.4	36.2	45.0	1.5	42.7

Table 9: Phenomena at trochaic breaks, lines without caesura at 5 or 7.

Therefore one thing our account will have to explain is how elision could be possible (though dispreferred) across the obligatory caesura; another is why it is that metrical resyllabification and epic correption are essentially unaffected.

It should be stressed that this is a puzzling and inherently paradoxical array of data. If the caesura was an obligatory location for a pause, how could elision apply across it? If it wasn't, why should some phenomena be substantially inhibited and others unaffected? Since a poetic form is a system of social conventions, and a product of historical processes, there doesn't have to be a simple and tidy system resolving all of its complexities, but it is still worth hoping that some measure of insight can be found.

The degree of paradox is heightened when we consider a further fact: if pause was obligatory at a position 5.5 caesura, we would naturally expect it to be possible for the following word to be able to start with a full range of consonant clusters, since these would be in the syllabic onset and therefore not counted for syllable weight. But this doesn't happen: after a 5.5 caesura we get the usual clusters that participate in 'Attic

correption' (non-nasal stop+liquid sequences, plus a /sk/ and /zd/ to admit a few proper names that otherwise wouldn't fit into the meter), but not /pt/, /gn/, etc. This is a direct contradiction with the testimony of the dovetail scansions: if V|CC can't scan with V light because '|' is not implemented as a pause, why should there be any inhibition on V scanning as heavy in this configuration (albeit in a different position in the line)? One possible resolution might be that there could have been pauses after the hemimeral caesuras but not the 5.5 caesura, but this seems implausible not only because of elision, but because a rallentando implementation of extra time at 5.5 would presumably have to be performed by prolonging the penultimate syllable, which is doable, but not very likely as the sole implementation (whereas, for the hemimerals, it would be the prepausal syllable itself that is prolonged, which is more likely).

Paradoxical situations in synchronic systems are often the result of diachronic changes. I suggest that this may be what is happening here. Suppose that the original performance style (perhaps the sung style, or the oldest sung style of the *aoidoi*) did not allow midline pauses (whether or not there was midline extra time is another issue), but at some later point, midline pauses became available at least as an option, as part of a general shift to a more speech-like (less stylized) mode of performance. The metrical effects of the old performance style with its continuous (synhapheic) syllabification of the line, however, did not disappear, since it was mostly the same verses that were being performed. Rather, the structure of the metrical system became somewhat more complex and abstract, taking heed not only of the actual syllabification implemented in performance, but of a 'virtual' syllabification, representing the older continuous style, internally generated by the performers and audiences, but not overtly performed.

It is fairly straightforward to implement such an analysis using the conceptual apparatus of modern phonology, in which a linguistic structure consists of multiple 'tiers' of sound-representing elements (phonemes, tonemes, phonological features, etc.), tied together into structures in various ways. Syllables are, for example, represented as a tier of elements symbolized as 'σ', which link to contiguous sequences of ordinary segmental phonemes (i.e., the things the Greeks figured out how to represent with letters). Given one syllabic tier, it is straightforward to add a second one; for our present purposes it is convenient to write one above the line, the other below. The two syllabifications will be identical except in the vicinity of pause, where consonants at the beginnings and ends of words may be assigned to different syllables in the two syllabifications:
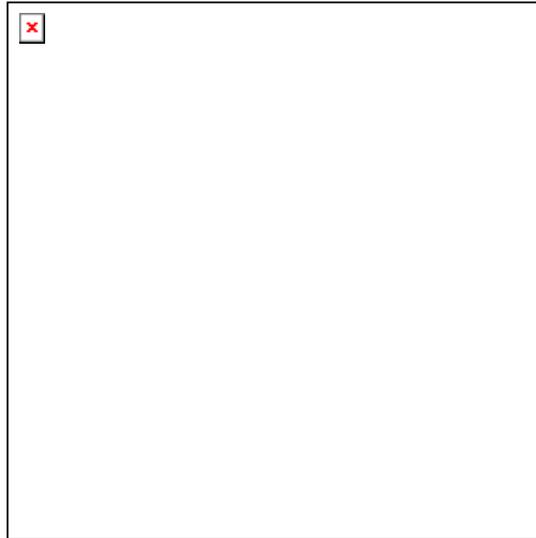
Figure 5: Two co-present syllabifications

So it remains to connect the meter to the two syllabifications. This can be done via the concept of 'mora', as construed in modern phonological theory. In modern phonology, moras are abstract units of 'weight', assigned to vowels and sometimes consonants on the basis of syllable structure (see Gussenhoven and Jacobs (1998:160-164) for a textbook discussion). In a 'weight-by-position' language such as Ancient Greek, the first vocalic element in a syllable gets one mora, and a subsequent element, whether vocalic or consonantal, gets a second mora, up to a limit of two (some languages allow three, but not Ancient Greek). It is conventional to have the moras as constituents of syllables, but there are no actual arguments for this, so we will treat the moras as an independent tier (cf. Keyser and Clements 1983).

On this basis, we will analyse the hexameter along the general lines proposed by Prince (1989), but with some minor notational modifications. The hexameter line will consist of six feet, each foot a branching structure consisting of two half-feet, each half-foot consisting of two moras. The first half-foot is constrained to have its moras belong to one syllable, the second is not so constrained (however the final half-foot doesn't branch, and material after its first mora is ignored):
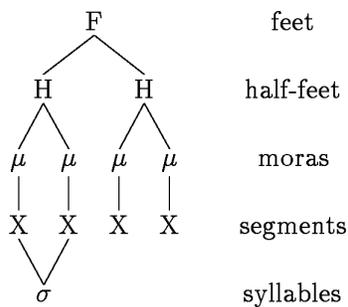

Figure 6: Foot structure template

The non-mention of syllable structure for the second half-foot signifies that there are no constraints on the deployment of the moras between syllables in this position; the

18

'X's indicate indifference as to whether the moras are being carried by consonants or vowels.

Now we need to work out the relationship between the moras and the two syllabifications. One principle appears to be that all moras implied by the virtual (synhapheic) syllabification must appear. This will prevent V|CC configurations from scanning the V as light, unless CC is legitimately subject to Attic correption. However epic correption is available; we can construe this as a matter of being able to delete or ignore a second mora assigned to a vocalic element when the next syllable begins with a vowel. We furthermore need some sort of principle to the effect that the moras placed by the virtual syllabification do not appear in positions that are too outlandish with respect to the overt syllabification. In particular, in a V|CC configuration, the virtual syllabification would assign a mora to first C, which would be in an onset in the overt syllabification; since this configuration is inhibited, we want it not to be countenanced (I assume that the instances of dovetails across position 5 caesura are achieved by means of a prolongational rather than pausal implementation of the extra time; some of them might also be instances of *brevis in longo*). This situation is illustrated below, where the μ subscripted to the V indicates a mora consistent with both syllabifications, and the * subscripted to the first C indicates that a mora is required by one syllabification but not countenanced by the other:
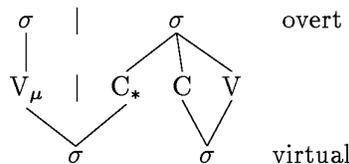
$$\sigma \quad | \quad \sigma \qquad \text{overt}$$
$$V_\mu \quad | \quad C_* \quad C \quad V$$
$$\sigma \qquad \sigma \qquad \text{virtual}$$

Figure 7: Clashing requirements for moras

Of course, if the pause, represented by '|', is absent, then the first C can be assigned to the first syllable at the overt level as well as the virtual, and will then carry a mora without issues. Likewise, if the cluster is subject to regular Attic correption, it can be assigned to the second syllable on both syllabifications, and the first syllable will happily be light.

The idea of two syllabifications can thus resolve the apparent contradiction between the inhibition of dovetail scansions, inhibited at caesura because they require a more difficult implementation of extra time (and perhaps a suboptimal realization, in the form of less extra time), and the failure to admit arbitrary complex onsets after the post-caesural pause. However we still need to say something about epic correption and metrical resyllabification (the configuration of Figure 1), as well as the configuration VC|C.

The former involves shortening across a pause (at least for the purposes of meter, however it might have been performed), while the latter two involve the issue of whether or not prepausal consonants count for moraification. If they do, it's hard to understand why VC|V has the first syllable (usually) light; if they don't, then how does VC|C always manage to come up as heavy (and *never* light)? Note in particular that none of these configurations is inhibited in the way that V|CC appears to be. We consider the latter two problems first.

One important fact is that in language-structure, consonants at the end of a word or other domain can in general be treated as either moraic or non-moraic. For example Steriade (1988) argues that word-final consonants are non-moraic for the purposes of accent-placement in Ancient Greek. So neither of the configurations that we want the overt syllabification to tolerate are illicit by (genuine, typologically substantiated) universal standards. Another is that, in Greek, it doesn't seem possible to establish conclusively whether non-controversially prepausal consonants (such as those at line-end) were moraic or not (Allen 1973:204-207).

There are various possibilities: what I suggest here is that prepausal C is moraic, but there is also a metrical convention that a syllable's second potential mora can be ignored for the purposes of the meter when a vowel follows, regardless of pause. This has the effect of subsuming both metrical resyllabification and epic correption under a common principle, of a specifically metrical character, where optionality is a common feature. However, the optionality is only effective in the case of epic correption, since in the case of metrical syllabification, the mora that is optionally ignorable as far as the overt syllabification is concerned is forbidden for the virtual syllabification (since under that syllabification it belongs to an onset).

So the final conception is that in the application of the scheme of Figure 2, every mora that is linked to an H (half-foot) must be well-placed in accordance with the virtual syllabification, and, furthermore, that all of the moras that are motivated by the overt syllabification must appear and be linked to H, *except* for second moras in a syllable which are followed by a vowel.[6] When such a mora is attached to a vowel, the result is optional epic correption; when it is attached to a consonant, the result is metrical resyllabification, which must occur because the consonant cannot support a mora in accordance with the virtual syllabification, since the consonant is an onset there.

An example of foot-structure is provided in figure 8, from the middle of *Od.*10.275. The (segmental) phonemes, moras and syllables of ἔμελλον ἰών are represented, together with the structure of the foot spanning these words (surrounding feet omitted), assuming a pause between them. Since the syllabifications are almost the same, a single tier of σ's is used to represent both, with dashed and dotted lines used to encode the one discrepant assignment of phonemes to syllables. Which is that, because of the pause, in the overt syllabification, the final ν of ἔμελλον goes with its preceding vowel, but in the virtual one, since pauses are ignored, it is resyllabified to go with the following vowel. And finally, since the mora it introduces is a second mora preceded by a vowel, it can be ignored when the metrical foot structure is built.

dotted line: overt syllabification
dashed line: virtual syllabification
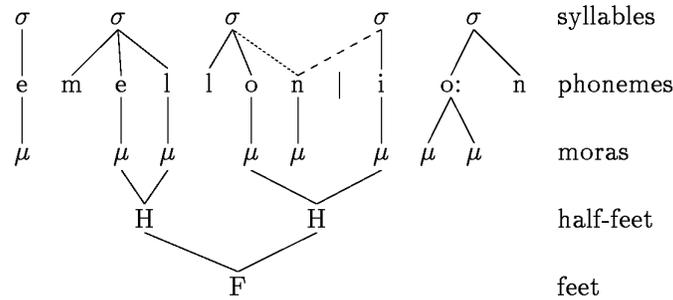solid line: both syllabifications

Figure 8: Sample foot structure

The analysis presented here thus reconciles the basic facts of the meter with the potential existence of midline pauses, and provides a possible account of the contradictory phenomena found at the caesura sites.

3.2 Performance Implications.
In the preceding subsection, I showed that the distribution of overlong syllables suggests that there was an allotment of 'extra time' in the line, and that other phenomena suggest that this allotment may sometimes have been spent as midline pauses, as well as prolongation of syllables before grammatical boundaries, especially at the obligatory caesura sites in the third and sometimes fourth foot. An analysis was presented that shows how this can be reconciled with the basic facts of the meter. However, the argument doesn't tell us anything about how much extra time there was, so a performance will have to involve a somewhat arbitrary choice.

In the present performance style, the final foot including interline pause takes up on average about 25% of the total time occupied by the line,[7] while the foot containing the obligatory caesura occupies 21% of the time of the line. Unsurprisingly, these feet are longer when they contain a clause-boundary, shorter when they don't. This was not a result of following any deliberate policy, although I was certainly was aware of the operative principles (more extra time at more important boundaries) at the time the recordings were made.

I suggest that this distribution of extra time can be regarded as the outcome of an underlying 'ideal' rhythmic scheme of 8 beats per line, 6 for the ictuses, one for the end-of-line pause, and one for the within-line extra time, usually but not always deployed mostly at the obligatory caesura. When the line-end or caesura corresponds to a major syntactic boundary between clauses, the full foot-worth of extra time is likely to be allocated; otherwise less. We cannot and probably never will be able to know whether some kind of eight-beat scheme was actually employed, and how rigid its timing was, although investigation of extant oral and sung or chanted poetic traditions might be able to provide some guidance as to what possibilities are plausible.

A diagram of a typical line with a third foot (position 5.5) caesura is shown in figure 9; one can see that foot 3 is approximately twice as long as the normal feet 1, 2, 4, 5

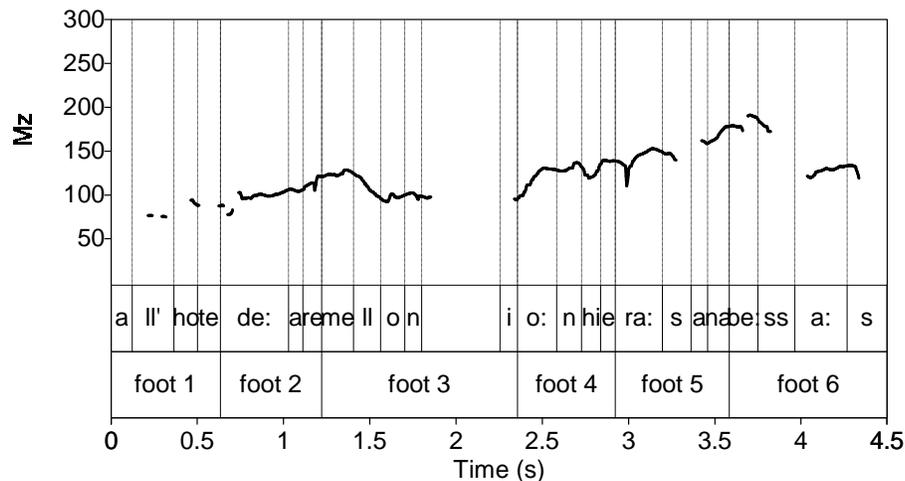(although 6 is in this case also fairly long).

Figure 9: Pitch and timing of *Od*.10.275

As mentioned above, other locations for the extra beat, and perhaps pause, are possible, especially after a fourth-foot dactyl.   Furthermore, in some lines, there is no plausible pausesite, since the likely ones are crossed by elision. An example is *Il*.1.118:

αὐτὰρ ἐμοὶ γέρας αὐτίχ᾽ ἑτοιμάσατ᾽ ὄφρα μὴ οἶος

This one is particularly interesting because both of the plausible locations for a pause (5.5 and 8) have elision (8 is also a finite clause boundary). I find that 447 Homeric lines have elision or no word-break across all of the standard caesura sites (5, 5.5, 7), and 151 of those have elision or no break at position 8 as well. This is a very small minority of lines, but they still need to be dealt with. In such cases I would propose to implement extra time by prolongation of pre-boundary syllables rather than pausing, with perhaps concomitant reduction of the actual amount of extra mid-line time allocated.

Another interesting example of this kind of line is *Od*.10.541:

῍Ως ἔφατ᾽ αὐτίκα δὲ χρυσόθρονος ἤλυθεν ἠώς

The syntactically most important boundary is at position 2, but we can't actually pause there because of the elision, and the long vowel in position 1 is too far away to get a good effect by prolonging it too much. A significant pause at position 8 also seems lame (perhaps because that would break connectivity with the line-final noun that the adjective before this position modifies), and there is a dovetail scansion across the otherwise most likely site for extra time, which is 5. A solution is to have no pauses as such, but a bit of elongation of the line-initial vowel, and also of the word-initial but syllable-final consonant χ after position 5. If such a pause-free implementation were the norm, there would be no explanation for the inhibition observed by Drewitt of dovetail scansions at position 5 (and at 7, when there aren't other plausible pause-sites), but if it were impossible, this line would be inexplicable.

Fortunately, poetic form is as much a matter of more vs. less expected or preferred as it is of possible vs. impossible.

If this approach is correct, then the ictus beats were not spaced with metronomic regularity, and the line-lengths may well not have been precisely constant, which is certainly true of the present performance. Using Praat, I made measurements of line-length for a 11-line sample, recorded 15 times, and found that the mean line length was 5.20 sec., ranging from 4.58 sec to 5.95 sec, with highly significant differences in the length of specific lines (one way ANOVA test, more details on the CD). In spite of these objective variations, there seems to be a subjectively evident rhythm to the performance. Similar measurements for poetic performance techniques in different cultures might prove illuminating.

Section 3: Conclusion.
I have presented a putative rhapsodic style of Homeric performance, and motivated some but not all of its features from a combination of philological results and contemporary ideas from phonology. I would like to close with a speculation concerning the style and the evolution of the poems. From my subjective performer's perspective, the quality of the pitch melodies and the flexibly interpreted rhythms seems extremely high, much too good to be due to chance (the extent to which this comes across in the actual performance is, of course. not for me to judge). Granting this, it follows that people must have put it there, which would imply that these people were implementing these features in one way or another.

If the *aoidoi* were performing a repetitive chant on a restricted set of notes to a fixed rhythmic scheme, they would seem to be unlikely candidates to be these people, since there wouldn't be any motivation for them to install these features if their performance style didn't implement them. One possibility is that their performances were more melodically and rhythmically fluid than currently supposed. However, a rigid melody and pause-free lines do seem to be a frequent characteristic of oral poetry, and the phenomenon of synhapheia in the line suggests that in the earliest performance style in the Homeric tradition, there weren't any pauses internal to lines. But *aoidoi* are only depicted as performing relatively short pieces, as local dinnertime entertainment. The *Iliad* and the *Odyssey* as such seem to appear in a rather different context, large public gatherings, with the performers competing against each other for prizes. Somewhere in the course of this development, the stringed instrument disappears.

The loss of the instrumental accompaniment would facilitate making the pitch contours and rhythms more flexible, and a competitive environment would provide incentives for making the performances more effective, and the means for innovations to spread. The complex system of line-spanning formulas discussed by Matthews (1997) would also be consistent with rhythmic flexibility, since the resulting compositional units not only span lines, but also end and begin within them. A system of this kind seems somewhat unusual for oral poetry, but is something that might plausibly emerge in a competitive environment where performers were vying to produce increasingly sophisticated renditions of the material.

 Therefore, however the poems may have originated, their rhythmic and melodic properties might be explained if they were substantially shaped by rhapsodes who

were competing with each other. This is consistent with arguments offered by Nagy (1996, 2000b), Matthews (1997) and others that the early rhapsodes did not deliver a fixed text, but engaged in a substantial degree of creative composition.

Bibliography

Allen, W. Sydney (1973) *Rhythm and Metre.* Cambridge University Press.

Anderson, Stephen R. (1973) '*u*-Umlaut and Skaldic Verse', in S.R. Anderson and Paul Kiparsky (eds) *A Festschrift for Morris Halle*. Holt, Rinehart and Winston.

Bakker, Egbert J (1988) *Linguistic Formulas in Homer*. Benjamins.

Bolling, G.M. (1913) 'Contributions to the Study of Homeric Metre. II: Length by Position'. *American Journal of Philology* 34: 153-171.

Clark, Matthew (1997) *Out of Line.* Rowman and Littlefield.

Daitz, Stephen (1991) 'On Reading Homer Aloud: to Pause or Not to Pause' . *American Journal of Philology* 112:149-160.

Danek, Georg and Stephan Hagel (1995) 'Homer-Singen'. *Wiener Humanistiche Blätter*, 5-20. Also available at http://www.oeaw.ac.at/kal/sh/ (as of Oct 2, 2002).

Devine, A.M. and Laurence D. Stephens (1991) 'Dionysius of Halicarnassus, *De Compositione Verborum* XI: Reconstructing the Phonetics of the Greek Accent'. *TAPA* 121:229-286.

Devine, A.M. and Laurence D. Stephens (1994) *The Prosody of Greek Speech.* Oxford University Press.

Drewitt, J.A.J. (1908) 'Some Differences between Speech-scansion and Narrative-scansion in Homeric Verse'. *Classical Quarterly* 2:94-109.

Gussenhoven, Carlos and Haike Jacobs (1998) *Understanding Phonology*, Arnold, London.

Halle, M. and S.J. Keyser (1981) 'Metrica'. *Enciclopedia Enaudi* vol 9:254-284, Torino.

Hardie, W.R. (1920) *Res Metrica.* Oxford University Press.

Kahane, Ahuvia (1994*) The Interpretation of Order: A Study in the Poetics of Homeric Repeition*. Oxford University Press.

Keyser, Samuel J. and Nicholas Clements (1983) *CV Phonology*, MIT Press.

Lehrs, Karl (1882) *De Aristarchi Studiis Homericis*. reprinted 1964. Georg Olms
    Verlagsbuchhandlung, Hildesheim.

Marshall, Christopher (2002) 'The Melody of Homeric Performance'. talk delivered
    at the *Fifth Biennial Conference on Orality and Literacy in Ancient Greece*,
    University of Melbourne.

Nagy, Gregory (1996) *Poetry as Performance: Homer and Beyond.*
    Cambridge University Press.

Nagy, Gregory (2000a) 'Reading Greek Poetry Aloud: Evidence from the
    Bacchylides: Papyri'. Quaderni Urbinati di Cultura Classica, Nuova Seria 64, N
    1 - 2000. pp 7-27

Nagy, Gregory (2000b). Review of Martin L.West (ed.) *Homeri Ilias. Recensuit /
    testimonia congessit. Volumen prius, rhapsodias I-XII continens*.   Stuttgart and
    Leipzig: Bibliotheca Teubneriana, 1998. Bryn Mawr Classical Review 2000.9.12.
    Online at URL **http://ccat.sas.upenn.edu/bmcr/2000/2000-09-12.html as of June 11, 2006.**

O'Neill Jr., E.G. (1942) 'The Localization of Metrical Word-Types in the Greek
    Hexameter. Homer, Hesiod and the Alexandrians'. *Yale Classical Studies* 8:105-
    78.

Pierrehumbert, Janet and Mary Beckman (1988) *Japanese Tone Structure.* MIT Press.

Prince, Alan S. (1989) 'Metrical Forms', in P. Kiparsky and G. Youmans (ed)
    Rhythm and Meter, Academic Press, San Diego, pp 45-86.

Raalte, Marlein van (1986) *Rhythm and Meter: Towards a Systematic Description
    of Greek Stichic Verse*. Van Gorcum, Assen.

Selkirk, Elizabeth O. (1984) *Phonology and Syntax: the Relation between Sound and
    Structure.* MIT Press, Cambridge MA.

Steriade, Donca (1988) 'Greek Accent: A Case for Preserving Structure'. *Linguistic
    Inquiry* 19:271-314.

Sturtevant, R.H. (1921) 'Word-ends and Pauses in the Hexameter'. *The American
    Journal of Philology* 42:289-309.

Sturtevant, R.H (1924) 'The Doctrine of Caesura, a Philological Ghost'. *The
    American Journal of Philology* 45:329-350.

Usher, S. (1985) *Dionysious of Halicarnassus: The Critical Essays in Two Volumes*.
    Harvard University Press, Cambridge MA.

Wyatt, W.F. (1992) 'Daitz on Reading Homeric Verse'. *Bryn Mawr Classical Review*
    .02.07.09.

[1] Catathesis is one of a number of 'downtrend' processes whereby pitch tends to fall in the course of an utterance; what is distinctive about it is that it is triggered specifically by the occurrence of a high pitch, perhaps in a particular environment as specified by the grammar of the language.

[2] Devine and Stephens' 'minor phrase' seems to correspond to Beckman and Pierrehumbert's 'intermediate phrase'

[3] Listed in Lehrs (1882:388-397), with one apparent omission, Il16:608. This and certain other facts about counts were found by the use of computer programs, as discussed below.

[4] Counting the putative 'caesura-free lines' Il.23.159, Od.8.175 as having caesura between a verbal particle and the stem.

[5] The program was written and mostly used in the mid-nineties, for Windows 3.1; it still seems to work under Win98, but not in Win95 and Windows 2000 Professional.

[6] This formulation is inspired by the treatment of synaloepha in Halle and Keyser (1981).

[7] As measured for the all lines but the last in the sample **JUL_18_10_281-95A.wav**, a sample of 14 lines. A Praat textgrid analysis into feet is provided in the data section of the CD.