

# Orestes 344–45: Colometry and Music

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THE CENTRAL LINES of the second antistrophe in the second stasimon of Euripides' *Orestes* did not, on the strength of the manuscript tradition alone, seem to present any particularly difficult problems. I cite here the text of di Benedetto with his apparatus:<sup>1</sup>

ματέρος αἶμα cās, ὃ c' ἀναβακχεύει;  
κατολοφύρομαι κατολοφύρομαι.  
340 ὁ μέγας ὄλβος οὐ μόνιμος ἐν βροτοῖς·  
ἀνὰ δὲ λαῖφος ὥς  
τις ἀκάτου θοᾶς τινάξας δαίμων  
κατέκλυσε δεινῶν πόνων ὡς πόντου  
λάβροις ὀλεθρίοισιν ἐν κύμασιν.  
345 τίνα γὰρ ἔτι πάρος οἶκον ἄλλον

338 ματέρων A ὃ c'] ὄς H: ὄς c' V<sup>2</sup>O<sup>1</sup>L γρ. Σ in MC [II] 339 ante  
338 in Π 343 κατέκλυσε Π: κατέκλυσε codā. 344 λαύροις AP [II]  
ὀλεθρίοις VACL P ἐν] τὲ L [II]

But in 1892 Wessely published the now celebrated musical papyrus (*P.Vindob. inv. G 2315*), a fragment preserving parts of seven lines (*Or. 338ff*) accompanied by musical notation.<sup>2</sup> Written about 200 B.C.,

<sup>1</sup> V. di Benedetto, ed. *Euripidis Orestes* (Firenze 1965) 73–74.

<sup>2</sup> C. Wessely, "Papyrus-Fragment des Chorgesanges von Euripides *Orest* 330ff mit Partitur," *MPER* 5 (1892) 65–73; O. von Crusius, "Zu neu entdeckten antiken Musikresten," *Philologus* 52 (1893) 174–200 [hereafter CRUSIUS]. Wessely also published with C. E. Ruelle, "Le papyrus musical d'Euripide," *REG* 5 (1892) 265–80 [hereafter, WESSELY]. Recently the papyrus has been edited by Herbert Hunger and E. Pöhlmann, "Neue griechische Musikfragmente aus ptolemäischer Zeit in der Papyrussammlung der Österreichischen Nationalbibliothek," *WS* 75 (1962) 51–78 (photograph included) [hereafter, HUNGER AND PÖHLMANN]; and E. Pöhlmann, *Denkmäler altgriechischer Musik* (Nürnberg 1970) 78–82 [hereafter, PÖHLMANN]. Sixteen other discussions of the papyrus are listed in Pöhlmann 80 n.1. To these add C. Sachs, *Musik des Altertums* (Breslau 1924) 70–71, 80; Fr. Aug. Gevaert, *La mélodie antique dans le chant de l'église latine* (Gand 1895) 388–89; Phillips Barry, "Greek Music," *Musical Quarterly* 5 (1919) 583–600; E. Clements, "The Interpretation of Greek Music," *JHS* 42 (1922) 162; and E. G. Turner, *Greek Manuscripts of the Ancient World* (Princeton 1971) 70, pl. 35 [hereafter, TURNER]. For the date of the papyrus, see Turner, "Two Unrecognized Ptolemaic Papyri," *JHS* 76 (1956) 95–96.

the papyrus is one of the earliest surviving musical texts and preserves the most substantial fragment of music composed for an extant tragedy; whether Euripides himself composed the music is an issue immaterial to this paper. Each line consists of an (interlinear) upper half containing the notes of vocal music and a lower half containing the Greek text and the notes of instrumental music (see PLATE 1).<sup>3</sup> I repeat here the recent edition of Hunger and Pöhlmann (1962) with their apparatus augmented by the modifications of Turner (1971):

	κατολοφύρομαι, ]	339
	] ḡ P C ḡ P Φ Π [	
1	κατολοφύρομαι ḡ ματέρος αιμα cās, ]	339 338
	] Z i Z E [	
2	ὄ c' ἀναβ, ακχέυει. ḡ ὁ μέγας ὄλβος οὐ ]	338 340
	] ḡ P C i Z [	
3	μόνιμο, c ἐμ βροτοῖς, ḡ ἀνὰ δὲ λαῖφος ὤς ]	340 341
	] C P ḡ C P ḡ Φ C-[	
4	τι, c ἄκῆ του θοᾶς τινά, ξας δαίμων, ]	342
	Φ Π P ḡ ? [	
5	κατέκλυσεν ] Γ Γ δ, λεινῶν, ]	343
	] Z i Z [	
6	πόνω, ν ] Γ Γ ὡς πόντ, ου, ]	343
	] P C P Z ? Φ [	
7	λάβροις ὀλεθρίοι, ḡ ρι, λέν κύμασιν, ]	344

1 ḡ Crusius, Π Wessely; *fine* ḡ Turner. 4 C—Pöhlmann, CZ Wessely.  
 5 Φ *vel* Ω Crusius; ? Pöhlmann, P Crusius. 6 Z Pöhlmann, ZΦ Crusius.  
 7 P Wessely, P Turner; ḡ Wessely; PZ *super* εἶ (*sic*) Pöhlmann, *ad dextram* Turner, PL Crusius; ? Pöhlmann, ÷ Turner; Φ Pöhlmann, Φ Crusius, Φ Turner.

<sup>3</sup> For the difference between the vocal and instrumental notations, see J. M. Barbour, "The Principles of Greek Notation," *Journal of the American Musicological Society* 13 (1960) 1-17. See in general R. P. Winnington-Ingram and J. F. Mountford, "Music," *OCD*<sup>2</sup> (1970) 705-13; Winnington-Ingram, "Greek Music (Ancient)," *Grove's Dictionary of Music and Musicians* 5 (1954) 770-81. The best collection of all the fragments of Greek music is found in Pöhlmann. For another setting to an Euripidean text, see Mme. Jourdan-Hemmerdinger, *CRAI* 1973, 292-302; and *P.Oxy.* XLIV 3161-62 with pls. vi-vii. The most complete and up-to-date bibliography of ancient Greek music is Thomas J. Mathiesen, *A Bibliography of Sources for the Study of Ancient Greek Music* (Hackensack 1974) 1-59.

The papyrus reverses the order of lines 338 and 339 of the manuscripts, and scholars have long debated the merits of this reversal.<sup>4</sup> But no part of the fragment has produced as many unsatisfactory conjectures as the text and music of line 7 (= 344). Most of the interlinear vocal music but little of its Greek text have been preserved, and scholars have attempted in vain to fit the Euripidean text preserved in the manuscripts to both the music and the few remaining traces of the text in the papyrus. The aims of this paper are (1) to clarify the music and text of line 7, and (2) to suggest a new correlation between the text of the manuscripts and that of the papyrus, as required by demands imposed by the musical notation of the papyrus. (3) In following the demands the musical notation makes on the text, we must also establish a different colometry for lines 344–45. Unfortunately, a conclusive solution to the textual problem in line 7 remains to be found.

Since the traces of the musical notation of line 7 are more extensive than those of the text, we must commence with the reading of the music. The first visible vocal note of the line lies under the right side of the *diastole* in the line above (see PLATE 1).<sup>5</sup> There is a clear trace of the top of this note; the trace consists of a slightly slanted vertical stroke with a curved stroke connecting at its upper right. Considering the vocal notes of the two scales represented, one must conclude that the note is a *rho*. Wessely, Crusius, Pöhlmann and Turner all agree in this. No other note could fit the remaining traces of ink and also

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The vocal notes of the *harmoniai* used in the papyrus are these: **E**=e+', **Z**=e', **I**=d', **Π**=ḅ, **P**=a+, **C**=a, **Φ**=g. The + raises the note by a quartertone; a+ lies between our modern a and ḅ. There are also several instrumental notes, most importantly the frequently appearing **Λ**=g'. The modern equivalencies are based on Barbour, who follows Bellermann's system.

<sup>4</sup> G. A. Longman, "The Musical Papyrus: Euripides *Orestes* 332–40," *CQ* 56 (1962) 61–66, recently tried to prove that the papyrus' order of lines 339/338/340 offered a text superior to that of the traditional order and to that of Kirchhoff's transposed order 338/340/339. Longman did convincingly show that the transposed version of Kirchhoff was unnecessary, as did D. Feaver, "The Musical Setting of Euripides' *Orestes*," *AJP* 81 (1960) 9 n.24. V. di Benedetto, *op.cit.* (*supra* n.1) 73–74, the most recent editor of the *Orestes*, prints the order of the mediaeval manuscripts. Turner, *art.cit.* (*supra* n.2) 96, prefers the order of the papyrus.

<sup>5</sup> The *diastole*, a curved mark which designates the division between text and instrumental music, is an unquestionable reading. See Pöhlmann 141 and 92 (*P.Vindob. inv.* G 29815f). Line 5 of this fragment shows a similar *diastole*. Wessely 270 mistakenly thought this sign was another instrumental note, but *cf.* V. Gardthausen, *Griechische Palaeographie II* (Leipzig 1913) 399.

belong to the scales of this piece—the scales of Aristides’ Phrygian and Dorian *harmoniai*.<sup>6</sup> Moreover, examples of vocal *rho* in lines 1, 3 and 4 match the partial remains of this letter. Finally, the next vocal note to follow the *rho* is appropriately a *sigma*. The interval between *rho* (a+) and *sigma* (a) would be not at all awkward, for the notes occur in the same note-cluster.<sup>7</sup> These musical and palaeographical considerations indicate that *rho* is the preferred reading.

The note that should follow this *rho* to the right does not appear on the papyrus, nor is there any hint that there was ever a vocal note written there. According to the rules that scholars have elicited from our other early fragments of Greek music, the syllable of text below this blank space would be sung to the same note (*rho*) as the preceding syllable.<sup>8</sup>

The next mark is undoubtedly the *stigma* (a dot which signifies a rhythmical emphasis) which was to appear over the instrumental note **⌊** (as it did in lines 1–4), but Crusius thought the straight line after the second vocal *rho* in this line was the upper horizontal of the **⌊**. He accordingly (pp.177, 180) assigned this *stigma* to a vocal note *sigma*. Crusius must have erred in his identification, however, for the vocal note which follows this *stigma* is certainly a *sigma*; we have seen that repeated notes were not written the second time. Moreover, Crusius would have had difficulty in explaining how a *stigma* could occur here. Thus far in the papyrus *stigmai* have occurred only over the first beat of each dochmius, over the third to last beat of each dochmius, and over the instrumental notes (**⌊**) which separate the dochmii. The *stigma* over Crusius’ proposed *sigma* would fall on the second to last beat of the dochmius, and so it would not signify an arsis or thesis.

<sup>6</sup> I shall discuss elsewhere the possible modulation of *harmoniai* in line 5.

<sup>7</sup> The notes of the papyrus all tend to fall in clusters of **ΦΠCΠ** or **IZE**. Thus the high notes and the low notes are played separately; *iota* and *rho*, for example, would rarely appear together. Whether these clusters suggest a tetrachordal construction for Aristides’ *harmoniai* is uncertain. Their use in this papyrus would lead one to believe that there were tetrachords in these early scales, but cf. R. P. Winnington-Ingram, *Mode in Ancient Greek Music* (Amsterdam 1968) 23, for the opposite view. This clustered arrangement caused the ‘new’ music of the composer and his colleagues to sound as if “it crawled like ants,” as described in ps.-Plut. *De mus.* 1142A. See also Ar. *Thesm.* 100.

<sup>8</sup> The omission of the second of two repeated notes may also occur in this papyrus in line 2 over *ἀναβακχέυει* or in line 6 over *πόντρου*, but both these readings are questionable. More certain examples can be found in *P. Vindob.* inv. G 29825 a/b *verso*, 3–5. See Pöhlmann 88.

The following two vocal notes are undoubtedly *sigma* (with *stigme*) and *rho*, but the next mark after the *rho* has created great disagreement and confusion among the editors of the *Orestes* papyrus. Wessely (p.270) called it a vocal  $\Gamma$  (reversed *gamma*); Crusius, as already mentioned, thought it was the instrumental  $\mathbf{\Gamma}$ ; Hunger and Pöhlmann (p.77) believe it to be a vocal note *zeta*. All three conjectures are unsatisfactory. Wessely's reversed *gamma* is a vocal note (e) which has not appeared on the papyrus in any other spot and which is musically too low for its position here; it does not belong to the cluster  $\Phi\Pi\mathbf{\Gamma}$ . Although this tone does belong to Aristides' Phrygian *harmonia*, it falls an octave too low. Crusius' instrumental  $\mathbf{\Gamma}$  fails because the  $\mathbf{\Gamma}$  in this line preceded the vocal *sigma*, as has been shown, and because the  $\mathbf{\Gamma}$  conjectured by Crusius has no *stigme* over it. All four examples of  $\mathbf{\Gamma}$  in lines 1–4 clearly have *stigmai*. Hunger and Pöhlmann's vocal *zeta* was posited on the condition that the text below it was  $\epsilon\epsilon\nu\ \kappa\acute{\upsilon}\mu\alpha\kappa\iota\nu$ . Their suggestion of doubling the *epsilon* to accommodate two contiguous vocal notes is brilliant, but the traces of ink left from the line of the text below hardly confirm their conjecture.<sup>9</sup> E. G. Turner (p.70) follows this same reading of the music but without articulating it to his text (double *epsilon*), for he has placed the vocal *zeta* over the next ensuing syllable and leaves the first *epsilon* without any note at all. The best reading of this mark will become clear when we discuss the text of line 7.

The next musical signs are a dot over a horizontal line (*stigme* and *disema*) placed above a letter now lost. These readings are secure since they stand so far above the other vocal notes in the line.<sup>10</sup> In at least three other examples, the only letter to have the *stigme* and *disema* above it was *pi*, and therefore another  $\Pi$  should be conjectured here.<sup>11</sup>

Crusius recognized the last extant note in the line as a *phi*, and subsequent editors have followed him; only the top of the hasta and the upper right of the curve survive. Crusius believed (p.178) that he could also distinguish a *stigme* to the upper right. The other editors have not repeated this reading, but as we shall see, there are metrical grounds for thinking that Crusius was correct.

<sup>9</sup> The doubled *epsilon* would be like the doubled *omega* in line 6. Two vocal notes so close to each other necessitated their conjecture.

<sup>10</sup> Hunger and Pöhlmann 77.

<sup>11</sup> This would mean that the  $\Pi$  stood over the third to last beat of the dochmius, which it does. See *infra* p.81. The other examples are in lines 3, 4 and 5, and perhaps 1.

Now that we have established the musical notes of line 7, we may determine more precisely what part of the received text can fit this music. We must follow the rules of musical graphics observed in the preceding lines of the *Orestes* papyrus: (1) the positioning of the text must conform to the positioning of the vocal notes, that is, a vocal note must stand over the first letter of the syllable it accompanies, and (2) only one note accompanies each syllable;<sup>12</sup> moreover, (3) the instrumental  $\dot{\iota}$  should occur between two dochmii, and (4) the first and third vocal notes after the beginning of each dochmius should carry *stigmai* (as the arsis and thesis of the dochmius). Finally, of course, the letters of the text must fit the traces of ink left on the papyrus; although this point may seem obvious, the conjectures of Crusius and Pöhlmann fail to observe it.

Wessely (p.270) read the four letters of text partly preserved in line 7 as OCΩN; this reading, however, does not correspond with the text of the manuscripts. The papyrus might well be a fragment of a musical anthology, passing from the *Orestes* to a new text at line 7: but in doing so it would have failed to complete the musical unit, the Euripidean antistrophe. On the assumptions, then, that we have a coherent text and that the mediaeval textual tradition must be accommodated, the organization of all seven lines of the papyrus ought to be consistent. The first four lines each contain two dochmii; the exceptional single dochmius of line 5 is probably to be explained by the presence of an instrumental interlude.<sup>13</sup> Therefore it is probable that lines 6 and 7 also contained two dochmii, so that the first dochmius *πόνων ὡς πόντου* would have been followed by *λάβροις ὀλεθρίοι|σιν ἐν κύμασιν | τίνα γὰρ ἔτι πάρος* of our manuscript tradition. The hypothesis that line 7 contained two dochmii is confirmed by the

<sup>12</sup> If the syllable includes a diphthong or if the vowel of the syllable is doubled, it may have two vocal notes. See my note, "A Diphthong in the *Orestes* Papyrus," *AJP* 97 (1976) 172–73, and the two Delphic Hymns in S. Eitrem and R. P. Winnington-Ingram, "Fragments of Unknown Greek Tragic Texts with Musical Notation," *SymbOslo* 31 (1955) 9. The restoration of *ἀκάτου* in line 4 of the *Orestes* papyrus shows that its initial vocal note *sigma* in all likelihood stood slightly to the left of center of the first letter. There has apparently been an erasure here, however, which would explain the anomaly.

<sup>13</sup> Line 5 contains the instrumental interlude  $\text{ⲚⲚ}$  or  $\text{Ⲛⲛ}$ , which would probably have consumed a significant amount of time, especially if improvised notes were called for between the *diastole* ( $\text{Ⲛ}$ ) and the note  $\text{Ⲛ}$  ( $\text{Ⲛ}$ ). The *diastole*, of course, is never an instrumental note; here it is a symbol for dividing vocal music from instrumental. In a subsequent paper I shall discuss the readings of the notes in this instrumental interlude and the complex musical arrangement of line 5.

traces on the papyrus, for the dot which remains in the middle of the musical part of line 7 is certainly the *stigma* of the instrumental note  $\text{L}$ , and this  $\dot{\text{L}}$  served both as the musical note on which Aristides' Phrygian *harmonia* of the piece was based and as the dividing point between the two *dochmii* of each line.<sup>14</sup> Therefore we can be certain that line 7 had at least two *dochmii* divided by this instrumental note. Thus our analysis of the music in line 7 permits us to make statements about the text of line 7.

In 1893 Crusius (pp.178 and 180) reread the traces of line 7 as ?CIN: in his effort to fit the broken letters on the papyrus with the text of the manuscript tradition, he replaced Wessely's *omicron* by an 'uncertainty', the first stroke of Wessely's *omega* by *iota*, and the last two strokes of the *omega* by *nu*. Wessely's *nu* he symbolized as  $\blacktriangledown$  and called it a 'Vortragszeichen'.<sup>15</sup> Hunger and Pöhlmann (p.77) followed Crusius in reading CIN, but they omitted the 'uncertainty' altogether. They supposed that CIN belonged to  $\delta\lambda\epsilon\theta\rho\acute{\iota}\omicron\iota\epsilon\iota\nu$  of the text, which necessitated their conjecture of the doubled *epsilon* in  $\acute{\epsilon}\epsilon\nu$ .

But Crusius' reading does not appear to fit the traces that remain on the papyrus. His *sigma* would seem to have a top that is not rounded enough, the final stroke of the *nu* would be abnormally slanted,<sup>16</sup> and the *epsilon*s of  $\acute{\epsilon}\epsilon\nu$  would have no curves at all. Moreover, if the first syllable after the instrumental  $\dot{\text{L}}$  begins with a *sigma* in the text and a *sigma* in the music, why are they not positioned one over the other? Instead, the vocal note *sigma* must have been written far to the left of the text *sigma*, and this does not conform to the normal arrangement found elsewhere in the papyrus. Furthermore, there would not be room after the vocal *rho* for the vocal *zeta* restored by Hunger and Pöhlmann above the next letter. Clearly the top of the next letter of the text did not leave room for the base and oblique stroke of the vocal note *zeta*. Finally, while Hunger and Pöhlmann read CIN in the Greek text and place the vocal note *rho* over the first of their restored double *epsilon*s, the papyrus clearly shows that *rho* would rest instead over the *nu* of their supposed CIN.

<sup>14</sup> Thus the instrumental  $\dot{\text{L}}$  disappears in line 5 when the *harmonia* modulates to the Dorian at  $\delta\epsilon\iota\nu\acute{\omega}\nu\ \acute{\rho}\acute{\omicron}\nu\omega\nu$ . The new instrumental note does not appear on the extant portion of the papyrus; this modulation also I shall discuss elsewhere.

<sup>15</sup> He found another 'Vortragszeichen' at the end of line 4, but this sign is probably a *tetrasema* of the form  $\text{L}$ . See *infra* p.81. Cf. the 'Seikilos Song' in Pöhlmann 54 and in Eitrem, *op.cit.* (*supra* n.12) 73-74.

<sup>16</sup> This is still true of my own reading; for another example of the slanted *nu*, see B. L. Ullman, *Ancient Writing and its Influence* (New York 1963) pl. 3, line 7.

Rejecting the colometric assumption of Hunger and Pöhlmann, I propose that line 6 of the papyrus did not end with *ὡς πόντου* but contained a second dochmius ending with *ὀλεθρίοι-*. According to my reconstruction line 6 was written thus:

$\overset{\text{z}}{\text{z}} \overset{\text{i}}{\text{i}} \overset{\text{z}}{\text{z}}$   
 ΠΟΝΩ]ΝϮϮΩΩΠΟΝΤ[ΟΥ ἸΛΑΒΡΟΙΟΛΕΘΡΙΟΙ

This line of text would have contained 33 letters and instrumental notes, one character longer than line 3, the longest line attested elsewhere in the fragment. In other strophic poetry preserved on papyrus, line lengths often vary, with resulting irregular left or right margins.<sup>17</sup> Consequently a variation in line-length in this papyrus should not disturb us, nor should extension of a line farther to the right or left of other lines. The division of *λάβροις ὀλεθρίοι|σιν ἐν κύμασιν* between two different cola warrants no objection, for *κατολοφύρομαι* occurs in a line different from that of its repetition in line 1 of this papyrus; *ὁ μέγας* follows directly after *ἀναβακχεύει* in the same line even though a full stop intervenes; and the long exclamation *ἀνὰ δὲ λαῖφος ὤς | τις ἀκάτου θεᾶς τινάξας δαίμων | κατέκλυσε* is separated into three different cola. Furthermore the division of the syllables of *ὀλεθρίοι|σιν* between two lines has many parallels in both choral and personal lyric poetry.<sup>18</sup> Nor should the meter present any obstacles, for there are still three separate dochmii in *κατέκλυσε δεινῶν | πόνων ὡς πόντου* and *λάβροις ὀλεθρίοι-*. The last two dochmii are now in one colon, while Hunger and Pöhlmann would have the first two in two separate monodochmiac cola.<sup>19</sup> Also, the lines of the strophe parallel to these lines of the antistrophe fit the same metrical pattern. Lines 327–28 and 343–44 should be read in this way:

327    *μανιάδος φοιτα-*  
 343    *κατέκλυσε· δεινῶν*  
 327a   *λέου· φευεῦ μόχθων, οἴων ὦ τάλας*  
 343a   *πόνων· ὡς πόντου λάβροις ὀλεθρίοι-*  
 328    *ὄρεχθεῖς ἔρρεις,*  
 344    *σιν ἐν κύμασιν.*

<sup>17</sup> For examples see *P.Oxy.* XXIII 2369 (pl. III) of Sophocles' *Inachus* from the first century B.C.; *P.Oxy.* IX 1175 (pl. III) of Sophocles' *Eurygylus* from the second century; and *P.Oxy.* XXV 2436 (pl. XIV), a text which is notated with music.

<sup>18</sup> Cf. *φοιτα|λέου* in the strophe (line 327) of this stasimon, accepted by all the editors.

<sup>19</sup> The forms of the dochmii in the various arrangements of resolutions are all attested as common by D. S. Raven, *Greek Metre* (London 1962) 62–63, types a, b, e, n and p. The



Since my new colometry restores λάβροις ὀλεθρίοι- to the preceding line of the antistrophe, the parallel phrase in the strophe must be moved as well, and in fact οἴων ὦ τάλας of the strophe is just as movable as its parallel λάβροις ὀλεθρίοι- in the antistrophe.

Although this arrangement of lines may at first seem arbitrary, the proof should lie in the correlation of the new colometric arrangement with the remains of the text in line 7 of the papyrus. The text of line 7 (vv.344–45) was probably written

κιν ἐν κύμασιν ἱ τίνα γὰρ ἔτι πάρος

and the corresponding line of the strophe (vv.328–29) would therefore have been written

ὀρεχθεῖς ἔρρεις ἱ τρίποδος ἄπο φάτιν.

These are the dochmii which follow after λάβροις ὀλεθρίοι- (344a) in the antistrophe and after οἴων ὦ τάλας (328a) in the strophe. The instrumental ἱ should follow the end of the first dochmius as in the other lines having two dochmii; in this construction it falls after κύμασιν.

This colometry and the consequent position of the instrumental ἱ provide us a model for reading the traces of line 7. If lines 6–7 are divided thus,

πόνων ὡς πόντου ἱ λάβροις ὀλεθρίοι  
κιν ἐν κύμασιν ἱ τίνα γὰρ ἔτι πάρος

we see that the letters of line 7 which should lie under the musical notes preserved after the *stigma* of the instrumental ἱ and which should correspond to the extant traces of text are TINA. Can the traces be read thus? The first horizontal stroke (broken like the bar of *tau* in τινά[ξας], line 4) fits *tau* better than the *sigma* of Crusius and Hunger. But the most cogent reason for reading *tau* is the position of the vocal note *sigma* which accompanies the syllable in question. A musical note regularly lies directly above, or just to the right of center above, the first letter of the syllable it accompanies. Here the musical note *sigma* falls too far to the left of the supposed *sigma* of

φευεῦ in line 327a of the strophe may well have been sung as φεῦ, for the diphthong *ευ* was pronounced as two separate sounds in the fifth and third centuries B.C.—the centuries in which either Euripides or a later composer, respectively, wrote the music. See Carl Buck, *Comparative Grammar of Greek and Latin* (Chicago 1933) 89, and *supra* n.12.

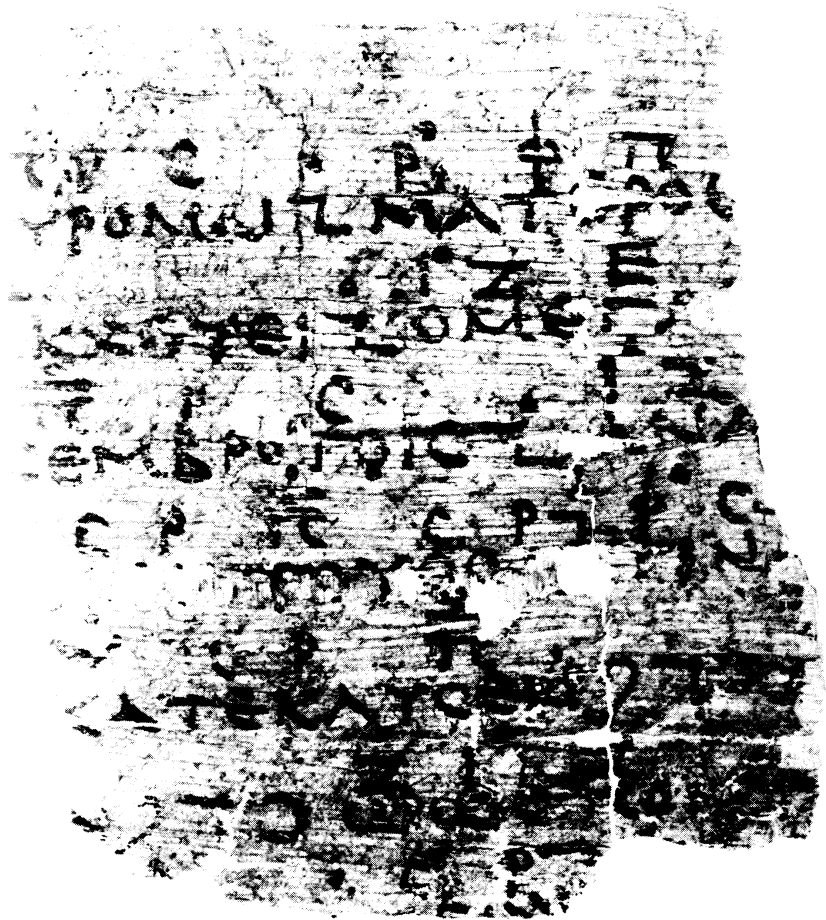
CIN—a displacement not observed elsewhere in either this papyrus or any of the other extant musical papyri. But if our surviving horizontal stroke is the broken right half of the bar of *tau*, the length of the original stroke would be sufficient to explain the placement of the vocal note *sigma* above it.

The next letters have since Crusius been tentatively read as IN, and this reading is consistent with my own proposal. The *iota* presents no palaeographical difficulty. The *nu*, however, while possible, would have to have been very poorly made. The top of its right vertical stroke makes an extreme curve toward the left. Conceivably this curve then caused the scribe to bend the rest of the line upwards to a degree more than the other lines of the fragment; the other lines do rise upwards toward the right margin, particularly line 4. In my reconstruction the oblique stroke of the next letter would have to be the apex of the *alpha*. But unless the ink and its underlying papyrus fibers have been damaged because of their position at the edge of the fragment, the reading of an *alpha* here must remain in doubt.

My suggestion  $\tau\acute{\iota}\nu\alpha$  has in turn an implication for the accompanying music. Hunger and Pöhlmann were plainly mistaken in placing contiguous musical notes **PZ** over the double *epsilons* that they restored to the right of the surviving text. As PLATE 1 shows, the note *rho* stands over the letter that all scholars since Crusius have read as *nu*. If the text reads  $\tau\acute{\iota}\nu\alpha$ , then the horizontal stroke following the note *rho* stands over the *alpha*. This horizontal stroke therefore could not be part of a musical note *zeta*, for only one vocal note can appear above each syllable. Moreover, the oblique and lower horizontal strokes of *zeta* cannot fit into the space above the textual letter. I suggest that instead of *zeta* we read a *disema* (long mark) over the proposed (and otherwise short) syllable NA. The *disema* seems to be the only possible musical (in this instance rhythmical) sign that can fit the horizontal stroke on the papyrus, not overlap the letter below it, and still comply with the rules of ancient Greek musical notation.

To lengthen the short syllable NA by the use of a *disema* would negate the expected rhythmic interpretation of this dochmius,  $\tau\acute{\iota}\nu\alpha \gamma\acute{\alpha}\rho \acute{\epsilon}\tau\iota \pi\acute{\alpha}\rho\omicron\varsigma$ ; such lengthening would correspondingly shorten the next three syllables— $\tau\acute{\iota}\nu\alpha \gamma\acute{\alpha}\rho \acute{\epsilon}\tau\iota \pi\acute{\alpha}\rho\omicron\varsigma$ .<sup>20</sup> A. M. Dale cited

<sup>20</sup> Dochmii rarely have pyrrhic fourth beats, yet the form  $\cup\text{---}\cup\cup\cup\text{---}$  is possible, as in Aesch. *Agam.* 1176.



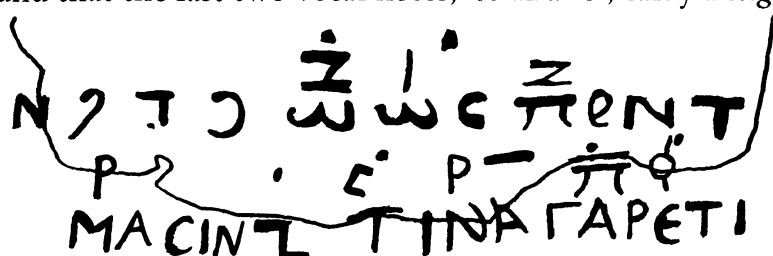
THE ORESTES MUSICAL PAPYRUS, *P. Vindob.* inv. G 2315

*(enlarged by ten per cent)*

*(Photograph by courtesy of the Nationalbibliothek, Wien)*

Aristoxenus' mention of *poikilia* and a similar discussion in Dionysius of Halicarnassus, *De Comp. Verb.* 15, as proof that such rhythmic variations did exist; she was quite insistent that "the music defined the quantities."<sup>21</sup> Winnington-Ingram, on the other hand, believes that the strict differentiation between longs and shorts was essential to the rhythm of Greek music.<sup>22</sup> If there is a *disema* in line 7 (and possibly a *tetrasema* in line 4) these signs would change our interpretation of the rhythm in passages about which we were once certain. The extraordinary uses of *disema* and *tetrasema* would suggest that the long and short quantities of unmarked syllables were regularly observed and appropriately pronounced. If, as I suggest, the *Orestes papyrus* confirms that there were indeed occasional exceptions to the rules of long and short quantities, we could be confident in analyzing regular longs and shorts. Finally, if such exceptions do exist, they would permit the opposing views of Dale and Winnington-Ingram to be reconciled: a consistent, rigid observance of long and short quantities would have constituted a rhythmic regularity in the midst of which occasional *poikilia* would have seemed more poignant.

In the drawing below I indicate my interpretation of the surviving traces of line 7 as seen in PLATE 1 and my reconstruction of the text they represent, to demonstrate that the vocal notes are positioned above the beginning of syllables, that the line of the text rises to the right, and that the last two vocal notes, π and φ, carry a *stigma*.



If the *stigma*—a secure reading—over the vocal *pi* of line 7 seems out of place on the fourth to the last beat of the dochmius, it is because the *disema* over the *alpha* of the syllable before it has moved the metrical value of the syllable γὰρ back towards ἔτι. The three short syllables of the adverbial (and relatively insignificant) γὰρ ἔτι were

<sup>21</sup> A. M. Dale, *The Lyric Meters of Greek Drama*<sup>2</sup> (Cambridge 1968) 5–8, and Aristoxenus §§292–94 Marq.

<sup>22</sup> This is Winnington-Ingram's basic concern in criticizing E. Martin, *Trois Documents*, in *CR* 55 (1955) 84–85.

presumably taken together as a tribrach third beat. Consequently all three notes over these three syllables would have to have *stigmai*, two of which are in fact preserved.<sup>23</sup> The postpositional construction *τρίποδος ἄπο* in the corresponding line of the strophe will also fit this triplet meter, but one must be cautious in equating the strophe's music with that of the antistrophe. The actual music may very well have been different. Nonetheless, the *stigma* over the vocal *pi* strongly suggests the necessity of a *disema* over the preceding syllable, and the *stigma* over the following vocal *phi* reinforces the case. Without the proposed *disema*, the secure *stigma* over the proposed *pi* would have no conceivable purpose; the *stigma* would have to fall on the third to last beat, but the vocal *phi* would have to be the fourth to last.

In sum, the OCΩN read in line 7 by Wessely conforms reasonably well with the traces left on the papyrus but bears no relation to the text of the mediaeval manuscripts, with the unattractive implication that the papyrus is a musical anthology that proceeds to a new piece of music without having finished out the last one. The CIN accepted since Crusius cannot conform to the rules of Greek musical notation: the vocal note *sigma* falls too far to the left of the textual letter *sigma*; and the note *rho* stands over the letter *nu*, the last letter of a syllable (a musical impossibility). Hunger and Pöhlmann's restoration of a double *epsilon* conforms very well to the rules of Greek musical notation, but the placement of the accompanying musical notes too far to the left excludes their reconstruction. In an effort to reconcile all three considerations—the papyrus, the manuscript tradition and the rules of musical notation—I suggest a new colometry in lines 344–45 such that the letters beneath the extant vocal notes would necessarily (on metrical grounds) be TINA. This reading, while palaeographically difficult, (1) places the vocal note *sigma* properly above the textual letter *tau*, (2) places the note *rho* above the letter *nu*, which in *τίνα* begins rather than ends a syllable (a musical necessity), and (3) conforms to the mediaeval text. This arrangement further implies that the last extant musical note is probably a *disema* placed over a normally short syllable. The *disema* is consonant with the rhythmic *stigmai* over the following musical notes, and this modification of the scansion of line 345 is apparently an instance of the metric *poikilia* attested by Aristoxenus and Dionysius; that such must be

<sup>23</sup> No one has yet offered a plausible explanation for the *disema* over the vocal note *pi* in this line or in lines 1, 3, 4 and 5.

specially marked suggests the normality of the contrast between long and short syllables. The *Orestes* papyrus thus offers new clues not only to the ancient colometry of the antistrophe but also to the rhythmic performance of music and poetry in Greek tragedy.

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