

## THE MYCENAEAN BARD: THE EVIDENCE FOR SOUND AND SONG\*

In this paper, I concentrate on the Mycenaean bard's concert lyre (here called phorminx), his singing, and aspects of his professionalism.<sup>1</sup>

### Prolegomena

Most of the Aegean Bronze Age (ca. 2200-1200 BCE) has produced images of musicians and singers, as well as depictions and the extant fragments of the instruments themselves. Nonetheless, what we know about Aegean music is dependent on what the Aegean artists felt comfortable about portraying—for instance, there are no images of women playing a musical instrument, and fewer instruments are depicted than have been found.<sup>2</sup>

In the Early and Middle Bronze Ages harps were popular.<sup>3</sup> Lyres<sup>4</sup> and sistra<sup>5</sup> make their first appearance early in the Middle Minoan period, and both continue into the Late Bronze Age (when both are associated with singing but not together). The earliest extant examples of sistra are in terracotta: a singleton from Archanes, Phournoi (MM IA context; Pl. I),<sup>6</sup> and five from the Ayios Charalambos cave in East Crete (MM II).<sup>7</sup> All six terracotta examples are similar: a short thick handle, and an oval frame which supports two thin, horizontal wooden sticks (restored) on which were strung terracotta disks. The sole extant bronze sistrum comes from a bronze hoard at Mochlos (LM I context);<sup>8</sup> it consists of a bent loop of bronze inserted between two flanges at the top of the handle. Two horizontal bronze pins pierce the loop (with bent ends on the outside, like cotter pins); on these pins were strung metal disks. Not only would the disks make a rattling sound, but the pins would jangle in their sockets and their angled ends would strike the loop. The sole depiction of a sistrum occurs on the Harvester Vase;<sup>9</sup> it is simpler, however, than the Mochlos sistrum, with two disks on only one horizontal pin; the pin seems to pierce the thin loop where its ends are capped.

### Aegean Lyres

Lyres appear early in the Middle Minoan period, and by the beginning of the Late Bronze Age they had apparently supplanted the harp. This new string instrument comes in two varieties: the tortoise-shell lyre (*chelys lyra*) and the concert lyre (*phorminx* or *kithara*). In the

\* Parts of this paper were included in an unpublished paper, "Aegean Music: Evidence for Sound and Song," delivered at the conference "Ancient Song in Cross-Cultural Perspective: Ritual, Performance, and History" at Emory University (3 March 2006).

1 Much of this paper relies on J.G. YOUNGER, *Music in the Aegean Bronze Age* (1998).

2 YOUNGER (*supra* n. 1) 51-60, esp. 60: "the representations of [Aegean] music were carefully designed to represent to us only certain people as the producers of music, only certain instruments, and only certain occasions."

3 YOUNGER (*supra* n. 1) 10-14.

4 Unlike harps, lyres have a set of strings of equal length descending to the soundbox from a yoke supported by two arms of equal length. To produce different tones, the strings are either tuned (by stretching them, usually tightening them at the yoke) or stopped by the fingers of the left hand (i.e., the fingers touch the strings at various heights, thus shortening their vibrations when they are struck). YOUNGER (*supra* n. 1) 14-18.

5 YOUNGER (*supra* n. 1) 38-40.

6 YOUNGER (*supra* n. 1) 65 no. 24, pl. 22.

7 I thank Philip Betancourt for informing me about these examples during the EPOS conference, and I had the good fortune to see them in the Ayios Nikolaos Museum later that summer.

8 I am grateful to Jeffrey Soles who allowed me to see this sistrum in storage in the East Cretan Center in 2005.

9 YOUNGER (*supra* n. 1) 74-75, no. 53, pl. 22.

Classical period, “the chelys lyre was the quintessential instrument of the amateur musician.”<sup>10</sup> By contrast, the Classical kithara was large and ornate and for professionals only.<sup>11</sup>

Both instruments are attested in the Late Bronze Age. The chelys lyre is known from extant examples only: two tortoise shells and fragments of others from the East Sanctuary at Phylakopi (LH III A:2-C context; Pl. II).<sup>12</sup> From drilled holes in some of these shells (to attach lyre arms) it is likely they served as soundboxes. Since no depiction of the chelys lyre has survived (did Bronze Age artists think them too humble for formal art?), it is possible that these were the instruments that women played.

The concert lyre, however, is known from extant examples and from many depictions.<sup>13</sup> The earliest depiction is on a stamp seal from Knossos<sup>14</sup> (Malia Workshop, MM II; Pl. III), but all other examples are Mycenaean. This instrument (Pl. IV) is similar to the Classical kithara: it was large (as tall as the musician’s upper body), with a rounded, crescent-shaped soundbox to which seven strings descend from a lathed yoke supported by complex arms. All extant fragments are of ivory. The earliest extant piece should date to the Shaft Grave period on style (it is decorated with “line & pulley” designs; Pl. V); the other extant examples come from LH III and IIIB contexts.<sup>15</sup> Depictions of these concert lyres are similarly late.

The Mycenaean name for these lyres is known, at least generically (*ru-ra*, *lyra*). A Thebes tablet (TH Av 106, LH III B:2 context), lists men including two who contribute other personnel.<sup>16</sup> On line 5, “Tameieus” contributes 6 fullers (*ka-na-pe-we*, *knapheís*) and on line 7 a man (whose name has not survived) contributes 2 lyre-players (*ru-ra-ta-e*, *lurateís*). It is possible that the word “lyra” here is generic (“lyre”) or is a popular term for any lyre, or refers to tortoise-shell lyres, like those votives found at Phylakopi.

Homer occasionally calls a concert lyre a *kítharis*, but usually he uses *phórmnix* (a non-Greek word)—to play the lyre is always *phormízô*.<sup>17</sup> He also occasionally comments on the beauty of the decoration (*Il.* 1.601ff, 9.185ff; *Od.* 1.153). Depictions contemporary with Homer, in bronze and terracotta figurines and in Late Geometric vase-painting (Pl. VI), call for a similar, simpler instrument than the Bronze Age concert lyre, with arms in one degree supporting the yoke; this simpler instrument also survives into the Classical period, when it is often played by women and Muses.<sup>18</sup> It has thus become standard to distinguish the three lyres of the Classical period: “chelys lyre” (or just simply “lyre”) for the everyday tortoise shell lyre, “kithara” for the grand concert lyre, and “phorminx” for the shorter, simpler lyre.

Since all Mycenaean depictions refer to a single form of concert lyre (no chelys lyre is depicted), I shall refer to it by its classy (and common) Homeric term, the phorminx.

## The Aegean Phorminx

The phorminx is played while standing (Pl. VII). According to rare Classical depictions of the phorminx in side-view or in the round, the lunate soundbox was humped at the back so it sat in the crook of one’s left arm.<sup>19</sup> From the soundbox project the two arms, divided into two sections (see Pl. IV). The lower half ends in a broken loop, whose upper part represents a duck-head whose bill is of one piece with the lower arm; these heads turn out toward the audience.<sup>20</sup> Into the top of the other half-loop, the upper arms are inserted and these end in carved finials.

10 S. BUNDRICK, *Music and Image in Classical Athens* (2005) 14-18, especially 14.

11 BUNDRICK (*supra* n. 10) 18-21.

12 YOUNGER (*supra* n. 1) 17-18, 63, no. 10.

13 YOUNGER (*supra* n. 1) 18-27.

14 CMS II 2, no. 33; YOUNGER (*supra* n. 1) 76-77, no. 59, pl. 24.

15 YOUNGER (*supra* n. 1) 61-63, nos. 1-9.

16 V.L. ARAVANTINOS, L. GODART, and A. SACCONI, *Thèbes. Fouilles de la Cadmée, 1: Les tablettes en linéaire B de la Odos Pelopidou. Édition et commentaire* (2001) 31-32, 176-78. V.L. ARAVANTINOS, L. GODART, and A. SACCONI, *Thèbes. Fouilles de la Cadmée, 3: Corpus des documents d’archives en linéaire B de Thèbes* (2002) 82-83.

17 Homer, *Il.* 1.601ff, 9.185ff. (*phórmingi ligeiê*); *Od.* 8.67 (*phórminga ligeian*), 8.257, 8.266, 17.261, 22.347, 23.144. Twice, Homer calls the lyre a *kítharis*: *Il.* 3.54, *Od.* 1.153 (*kítharin ... phormízôn*).

18 BUNDRICK (*supra* n. 10) 25-26.

19 YOUNGER (*supra* n. 1) 19 n. 49; add BUNDRICK (*supra* n. 10) 205, n. 23.

20 Compare the side-view of a chelys lyre on a hydria by the Niobid Painter: BUNDRICK (*supra* n. 10) 93, fig. 57.

The duck neck (top part of the lower arm) does not quite touch the lowest part of the upper arm (the duck head). Across the upper arms sits the yoke in a notch. Seven strings descend to the soundbox and when tightened they would compress the upper arms would toward the necks of the duck heads giving back appropriate tension and extra resonance.

From the Menidi tholos (LH III B context) come two extant ivory lyres (Pl. VII);<sup>21</sup> one has been restored wrongly but it gives the best idea; since only the upper arms were used in the reconstruction, this phorminx looks like the simpler Classical phorminx. An ivory box or footstool has been co-opted for the soundbox. The upper arm finials, however, preserve some of their carving (Pl. IX): two rampant lions flanking something; my reconstruction incorporates designs from two sealstones to give a sense of the original.<sup>22</sup>

Ivory fragments from Mycenae ChT 81 (pottery not diagnostic) can be recognized as the plektron (pick), bridge, and lower arm of a lyre (Pl. V).<sup>23</sup> The designs on the arm are the typical “chain & pulley” designs found on the bone and ivory objects from the Shaft Graves; this lyre should be our earliest to have survived, therefore.

The depictions of the Mycenaean phorminx convey clearly how it was played: held in the left arm, high up on the waist, plucked or strummed by the right hand, the left held up against the strings perhaps to finger tune them or pluck individual strings.

The artist of the Ayia Triada sarcophagus (Pl. VII),<sup>24</sup> perhaps desiring to show the phorminx’s soundbox, has made the lyre player push his arm, as it were, through the strings, and the player’s tunic overlaps the lyre’s arm. Nonetheless, the general shape of the lyre, the stance of the lyre player, and even his plektron are all conveyed clearly.

In the Pylos fresco (Pl. X),<sup>25</sup> the musician simply holds the instrument at his right side (contrary to Piet de Jong’s reconstruction); it is unlikely that the musician was playing his instrument, for he could not have stretched his left arm long enough to brush against the strings, even if he was a unique left-handed lyre-player.

What was the sound of the phorminx like? First, from ethnographic parallels, both from Bronze Age Mesopotamia and Egypt, the seven strings were probably tuned as two conjunct tetrachords (e.g., b-e and e-a) with closely set, internal (“enharmonic”) intervals (e.g., b, c, c#, e; e, f, f#, a).<sup>26</sup> The emphases, therefore, would be primarily on the tonic (in this case, b), the subdominant (e), and its subdominant (a). Of course, individual strings could be finger-tuned at will, like on a guitar or violin. Second, the representations of actual playing (e.g., the Ayia Triada sarcophagus, and Classical depictions) show the musicians striking the strings near the soundbox where the greater tension would produce a brilliant and bright sound (striking the strings nearer the yoke would produce thicker and blurry sounds); the bright sound would correspond to Homer’s frequent use of *ligeia* to describe the music (noted above, n. 17). Third, the player on the Ayia Triada sarcophagus holds a plektron in his right hand and actual plektra have been found;<sup>27</sup> this implies that playing the phorminx mostly entailed strumming it, regardless of the tuning. (Of course, individual strings could be plucked by either right or left hand, or both at once to produce chords).

Two representations of the phorminx associate the instrument with winged creatures: the Pylos fresco with a griffin, and a pyxis from Chania with a flock of wheeling birds (Pl. XI).<sup>28</sup> This association corresponds closely with the frequent Homeric phrase “winged words,” the comparison of a plucked bowstring to the voice of a swallow (*Od.* 21.411), and the use of *iôê* (e.g., *Od.* 17.261: “about them rushed the ‘sound’ [*iôê*] of the phorminx”)<sup>29</sup>—the string of vowels well suits the open sounds of a strummed instrument.

21 YOUNGER (*supra* n. 1) 61-62, nos. 3-5, pls. 5, 8.1, 9.2-3.

22 CMS I, no. 243 (the rampant lions) and IV, no. 40D (the central palm).

23 YOUNGER (*supra* n. 1) 61, no. 1, pls. 3, 4, 7. I am grateful to K. Shelton, who reminded me at the EPOS conference how extraordinary Chamber Tomb 81 was: great size, painted doorway, and fair amount of precious furnishings. A. XENAKI-SAKELLARIOU, *Oi thalamôtoi tâphoi tôn Mukênôn* (1985) 224-31.

24 YOUNGER (*supra* n. 1) 66-67, no. 29, pls. 10-11, 18-19, and back cover (color).

25 YOUNGER (*supra* n. 1) 69, no. 31, pl. 31, and front cover (color)

26 YOUNGER (*supra* n. 1) 23-27.

27 YOUNGER (*supra* n. 1) 61-62, nos. 1?, 2?, 5 (pl. 5).

28 YOUNGER (*supra* n. 1) 70, no. 33, pl. 14.1.

29 The word is also used to describe a voice (*Il.* 10.139) and the wind (*Il.* 4.276, 11.308).

## Singing

Singing is depicted separately from playing the phorminx<sup>30</sup> on a couple of sealstones and the Harvester Vase.<sup>31</sup> The tiny amethyst disk from Shaft Grave Gamma (*CMS I*, no. 5; Pl. XII) depicts a bearded man with his head up and mouth open. Another disk (*CMS II* 3, no. 13a) carries another bearded man<sup>32</sup> with his throat extended and mouth open; the reverse of this disk carries a calf head. Other seals in the same stylistic group (“The Group of the Chanting Priest,” ca. 1660-1550) carry similar male and animal heads,<sup>33</sup> while another (*CMS II*, 2 no. 213) carries a boar’s head and knife on one side and, on the other, a Linear A inscription (KN Zg 55: “*ja-sa-ja*,” an abbreviated palindrome for *ja-sa-sa-ra*?). The animal heads and inscription may refer the occasion of the singing, a religious sacrifice.

The Harvester Vase depicts a long file of men processing in two groups (Pl. XIII). The shorter is led by a robed man (“the Leader”) followed by eight harvesters (nine men), the longer by a plump sistrum shaker (who is singing) followed by a group of three singers (Pl. XIV) and fourteen harvesters (eight men). The three singers are dressed peculiarly, in what look like formless robes, their hair is short, and they are beardless (are they eunuchs?). Their mouths are open and their heads are fanned out. If the artist had merely wanted to show three separate heads, he could have resorted to doubling (or, in this case, tripling) the head-profiles, using a technique (dittography) which is common throughout the vase.<sup>34</sup> The heads are also held at different angles: the outer two tilt their heads up, while middle figure tilts his down. These head positions may be meaningful, as if the singers were singing harmony (bass, baritone, and tenor). But since classical and Roman music allowed only for parallel octaves,<sup>35</sup> harmony may not have been sung in the Aegean Bronze Age—although Near Eastern music, as written, for example, on the Hurrian score from Ugarit (more below), allowed singing at least two-note chords.

What might Aegean singing have sounded like? First, the kind of song and its participants on the Harvester Vase.<sup>36</sup> In the Classical period, the typical harvest song was the “Linus,” a song of lament for the death of a young man. It was an antiphonal song, a type common in folksong, that employed statements (“calls”) from a lead singer and “responses” (often a repeated refrain) from the rest of the group.<sup>37</sup> It is obvious on the Harvester Vase that both the sistrum shaker and the three singers are singing, but the harvesters and the Leader are not. It is possible, therefore, that only the sistrum shaker “calls” and the three singers “respond” in place of the entire group—if so, then a kind of orchestrated professionalism has replaced the spontaneity of total group participation.

In my book, I also noted the structure of the procession on the Harvester Vase: most figures in pairs, and the shorter procession in a ratio of 1:2 to the longer procession, like that of the octave to its tonic. The exaggerated leg poses suggest a march (in double time, corresponding to the pairs of figures), and the Fallen figure (5) suggests an occasional dotted rhythm (like a trochee or cretic). With the entire procession dividing into thirds (two-thirds for the long procession, one-third for the short procession), with the break occurring at the sistrum shaker, I then reconstruct a “response & call” march-song (Pl. XV).<sup>38</sup>

30 In *Il.* 13.731, Homer, however, seems to connect the two, describing what would be called in Classical times a *kitharôidos*: to one the god gave martial prowess, to another skill in dancing, to a third the art of the kithara and song ...

31 YOUNGER (*supra* n. 1) 5-9, 74-75 no. 53 (Harvester Vase, pls. 1.1, 2), 77 no. 60 (*CMS I*, no. 5, pl. 24.2).

32 J.H. BETTS, “The Seal from Shaft Grave Gamma: a ‘Mycenaean Chieftain?’” *Temple University Aegean Symposium* 6 (1981) 2-8.

33 J.G. YOUNGER, *Bronze Age Aegean Seals in Their Middle Phase (ca. 1700-1550 B.C.)* (1993) 172-74.

34 See Pl. XIII, figures 8+9, 10+11, 12+13, 19+20, 21+22, 23+24.

35 M.L. WEST, *Ancient Greek Music* (1992) 40-41.

36 YOUNGER (*supra* n. 1) 5-9.

37 Such group songs are common in agricultural societies and in modern gospel singing.

38 Originally I had the harvesters harvesting olives, I have since realized that they hold winnowing fans for threshing wheat.

Second, the tonal quality of Aegean singing.<sup>39</sup> In Homer, singers are praised for their clarity and loudness; so too in Classical times. The usual word both in Homer and Classical literature is *ligús* or *ligurê aoidê* (e.g., of the sirens: *Od.* 12.44 & 183). This probably means nasal, high pitched, and thin or pinched, much like traditional Greek, Eastern Mediterranean, and Near Eastern music today.<sup>40</sup> And the best way to achieve this is to lift the head, stretch the throat, and sing through the nose. The Minoan singers on the sealstones and Harvester Vase would fit this physical description, their neck stretched out and head lifted.

So too in Classical times. In the tondo of a red-figure kylix perhaps by the Brygos Painter (Pl. XVI),<sup>41</sup> an adult man reclines on a *klinê* and sings about his *erómenos*, petting, in lieu of him, the love-gift hare below the couch; he tilts his head back, attenuating his neck, and sings a bit of Theognis (1365 Diehl I, 2) “*Ô paidôn kálliste ...*” (O most beautiful of boys ...). Similar scenes occur on other red-figure vases.<sup>42</sup>

## Theory and Scores

### Introduction

There are extant some 50 fragments of Classical Greek musical scores dating from the late fifth century BCE to the third century AC.<sup>43</sup> The notation has been deciphered because every note spanning several octaves was given a separate sign.<sup>44</sup> Several recordings, on CD and on-line, are available.<sup>45</sup>

From the Bronze Age Near East also come treatises of music theory and at least one score. Mesopotamian mathematical and lexical documents allow for the reconstruction of heptatonic (or diatonic) scales of seven notes, with descriptions of the intervals (including an “unclear” tritone) and directions for tuning the strings by using a cycle of fifths.<sup>46</sup> A clay document from Ugarit dates to the mid second millennium, contemporary with our Minoan-

39 Much of this section was inspired by T. MOORE, “What Did Greek and Roman Singing Sound Like?,” an unpublished paper delivered at the conference “Ancient Song in Cross-Cultural Perspective: Ritual, Performance, and History,” at Emory University (3 March 2006).

40 I especially think of traditional Greek folksongs and of Muslim calls to prayer. A good recording of modern Greek oral poets presents some convincing examples of what Homer’s poetry might have sounded like: Folkways Records 04468: “Modern Greek Heroic Oral Poetry” (available from amazon.com and smithsonianglobalsound.org). For me, on this recording, “The Crow & the Battle of Valtetzi,” sung in a high nasal voice to a strummed lyra, is the rendition closest to what I think Homer might have sounded like. Other recordings (e.g., at <http://www.oeaw.ac.at/kal/sh/#sample>) seem too “nice.”

41 Athens National Museum 1357; discussed and listed by K. DOVER, *Greek Homosexuality* (1989) 10, 224; listed as by the Shuvalov Painter in M.F. KILMER, *Greek Erotica* (1993) 263 no. R1053, with citations; illustrated by G. KOCH-HARNACK, *Knabenliebe und Tiergeschenke* (1983) 87, fig. 22, and attributed to the Brygos Painter (more likely to me).

42 P. ANDERSON, “A Verse-Scrap on a Kylix by Epiktetos,” *TAPA* 135 (2005) 267-77, esp. 268 n. 4, lists several examples, many of which also quote Theognis.

43 WEST (*supra* n. 35) 277-326, chapter 10, “The Musical Documents.”

44 WEST (*supra* n. 35) 254-76, chapter 9, “Notation and Pitch.”

45 CDs: “Ancient Greek Music” by the Kerylos Ensemble and conducted by Annie Belis (label K617); “Melpomen: Ancient Greek Music,” conducted by Conrad Steinmann (Harmonia Mundi B0004TVG7); and “Musique de la Grèce Antique” by the Madrid Atrium Musicae (Harmonia Mundi B000BTE4LG). Online, for instance, at: <http://www.oeaw.ac.at/kal/agm/>.

46 I rely here on R.J. DUMBRILL, *The Musicology and Organology of the Ancient Near East* (1998) 103-95. Four texts, when combined, allow for a partial reconstruction of Assyrian and Babylonian tuning techniques, and therefore for transcribing the sole surviving Hurrian score. CBS 10996 (University Museum, Philadelphia) is a Babylonian (Akkadian) mathematical text from Nippur (mid to late 1<sup>st</sup> millennium B.C.). U.3011 (British Museum) is a contemporary Sumerian-Akkadian lexical text from Ur, and it helps explain the terminology in CBS 10996. With the explained terminology, one can then understand VAT 10101, an Assyrian (Akkadian) song catalog (Pergamon Museum, Berlin, late 2<sup>nd</sup> millennium B.C.) and U.7/80 (British Museum), an Old Babylonian (Akkadian) text from Ur (early to middle 2<sup>nd</sup> millennium ) that gives instructions for tuning a lyre. Also see A.D. KILMER, “The Strings of Musical Instruments: Their Names, Numbers, and Significance,” *AS* 16 (1965) 261-72; “The Discovery of an Ancient Mesopotamian Theory of Music,” *PAPS* 115 (1971) 131-49; and A.D. KILMER and M. CIVIL, “Old Babylonian Musical Instructions Relating to Hymnody,” *JCS* 38 (1986) 94-98.

Mycenaean music;<sup>47</sup> it uses the musical terms found in the mathematical and lexical documents to record a hymn to the moon goddess Nikkal. Although its transcription has been the subject of some debate, the hymn is written, according to Anne Kilmer, in two-note chords (i.e., in close harmony), and it marches up and down a diatonic scale.<sup>48</sup>

With the possibility before us of contemporary knowledge in the Near East of music theory and even a score, it would not be out of place to imagine what Minoan-Mycenaean theory and songs might have been like.

### *Theory*

The relationship between mathematics and music is commonplace. Take a stringed instrument of a certain tension and therefore of a certain pitch, stop it down at one third the length and you get the fifth above; stop it down half way along its length and you get the octave above—such ratios underlie the playing of, for example, a violin.

A Linear A graffito in plaster at Ayia Triada presents a series of fractions (Pl. XVII). Several scholars have noted what seems to be a consistent progression leading up to “*ta-ja k*”, which, if it follows the progression (x, 1.5x 1.5[1.5x] ...), should be 5 1/16 (J.-P. Olivier therefore proposes that *ta-ja* is the Minoan word for “five”).<sup>49</sup> R. Stieglitz pointed out that the resulting ratios can be expressed musically as well<sup>50</sup>—I base the ratios on alto C (Pl. XVIII bottom row). The notes give us an enharmonic tetrachord C, C#, E, ↑F, G, quite close to the musical equivalent of tuning by fifths (Pl. XVIII top row)—it is “off” at the top end, but only slightly where the mathematical ratios are extremely fine.

### *Song*

While there is no Bronze Age Aegean score, several Linear B documents hint at literary composition techniques. T.B.L. Webster once drew attention to some headings in the Linear B documents that seem to betray a conscious use of meter.<sup>51</sup> The heading to PY Un 03<sup>52</sup> may refer to the initiation of the wanax at Pakijane when the “overseer of provisions” catalogues some items. The heading can be made to read (with some extensive elision) like a fairly decent dactylic hexameter (with caesura).

Pakijasi: *mujomenôi epi wanaktei / amphiekei opite<u>kheus*

Another heading, this one to well-known PY Ta 711,<sup>53</sup> records “This is what Pukequiri saw when the wanax appointed Aukeus as the damokoro ...”, and it can be made to read like a dactylic hexameter catalectic (last syllable omitted as a kind of full stop):

*ho wide Pukeqiri hot' wanax theke Aukewa damokoron /*

47 National Museum of Damascus RS 15.30 + 15.49 + 17.387. A.D. KILMER, “The Cult Song with Music from Ancient Ugarit: Another Interpretation,” *RA* 68 (1974) 69-82; A.D. KILMER, R.L. CROCKER, and R.R. BROWN, *Sounds of Silence: Recent Discoveries in Ancient Near Eastern Music* (1976); M. DUCHESNE-GUILLEMIN, “A Hurrian Musical Score from Ugarit: The Discovery of Mesopotamian Music,” *Sources from the Ancient Near East* 2 (1984) 63-94. M.L. WEST, “The Babylonian Musical Notation and the Hurrian Melodic Texts,” *Music and Letters* 75 (1993-1994) 161-79.

48 A recording is on-line: <http://www.webster.sk.ca/greenwich/EVIDENCE.htm>.

49 J.-P. OLIVIER. “Cinq’ en linéaire A?” in *Historical Philology: Greek, Latin, and Romance* (1992) 135-36.

50 R. STIEGLITZ, “Minoan Mathematics or Music?” *BASP* 15 (1978) 127-32.

51 T.B.L. WEBSTER, “Homer and the Mycenaean Tablets,” *Antiquity* 113 (1955) 10-14, esp. 11. Also see N.N. KAZANSKY, “Greek Poetry in the Mycenaean Times,” *XII Colloquio internazionale di micenologia. Abstracts Roma, 20-25 febbraio 2006* (2006) 103. Webster originally noted the following meters (reproduced in M. VENTRIS and J. CHADWICK, *Documents in Mycenaean Greek* [1959] 108): paroemiac (PY An 0001.1): *eretai Pleurônade iontes*; and pendant hemiepes (PY An 0035.1): *toikhodomai demeontes*.

52 VENTRIS and CHADWICK (*supra* n. 51) 221, no. 97.

53 VENTRIS and CHADWICK (*supra* n. 51) 335, no. 235.

*The Phaistos Disc*<sup>54</sup>

In 1980, Duhoux analyzed the Phaistos Disc and pointed out (in addition to the well-known marks at the ends of phrases) the repetitious use of prefixes, of whole words, and of endings.<sup>55</sup>

Side A (Pl. XIX) has a remarkable set of repeated prefixes (man-head + cookie [signs 02+12]); it closes without an “end-of-phrase” mark. Side B (Pl. XX) has few such repeated prefixes, but it does begin with repeating the same two signs and it closes with an “end-of-phrase” mark, as if to close the entire text.

Both side A and B begin with a long string of unrepeated words, a heading, or, to use song terminology, an introduction; then comes a series of repeated words on both sides, a verse, perhaps in “response” to “calls.” On Side A (Pl. XXI), the first section of the verse (A4) starts with a set of three words that repeats, establishing itself as a repeating refrain; the last phrase begins and ends with the same word, a coda.

Side B (Pl. XXII) has another “introduction” that ends with a word that introduces the subsequent three verses (as if subsequent verses were antiphonal); and each verse ends with a word that contains the same last two syllables – a rhymed “response,” therefore.

It seems to me that each side presents an unrepeated introduction followed by a verse of short repeated sections that (mostly) alternate, as if “calls” and “responses,” something like what I was imagining for the Harvester Vase. On side A, the “calls” (in yellow) and “responses” (in blue) end with a coda (a special ending for this first section, employing an internal repetition [red, blue, red]). On side B, the introduction (lines B1-3) begins with the often repeated pair of syllables on side A; the verse begins with the last “word” in the introduction (line B3) as a “call” (in red). This “call” alternates rigorously with “responses” (in two shades of blue) that repeat endings only. In effect, this verse section (lines B4-8) is an extended coda (as a finale to the entire text) with internal repetitions in the “responses” (B6 & B8), more elaborate than the simple internal repetition in the preliminary coda on side A.

For the sake of illustration I provide a “dummy” transcription (Pl. XXIII), supplying syllables to the signs so that readers can pronounce the inscription on the disc and hear the patterns described above.<sup>56</sup>

This self-conscious use of phrasing in the Phaistos Disc (end-of-phrase marks, alliteration, and rhyme), and the repetitions that establish song-like introductions, verses, refrains, rhymes, and even codas all suggest to me that the Aegeans were more sophisticated in the area of musical literacy than we have given them credit for.

John G. YOUNGER

54 See the essential editions by Y. DUHOUX, *Le disque de Phaestos (archéologie – épigraphie – édition critique – index)* (1977); and by L. GODART, *Il Disco di Festos: Certezze ed enigma di una grande scoperta* (1993; translated: *the Phaistos Disc. The Enigma of an Aegean Script*, 1995).

55 Y. DUHOUX, “L’écriture et le texte du disque de Phaestos,” in *Pepragména tou D’ diethnoús krêtolokou sunedriou Éráklio* (augoustou-septemvriou) (1980) vol. 1: 112-36.

56 Some of the Phaistos signs resemble signs in Linear AB, so I have assigned the same values: 12 qe, 19 sa, 29 ma, 35 te; in my article (“Cretan Hieroglyphic Transaction Terms: ‘Total Paid’ and ‘Total Owed’” in *Cretan Studies [Briciaka]. A Tribute to W.C. Brice* [2003] 301-16), I demonstrated that Hieroglyphic boat sign (CHIC 40) corresponds to AB ro<sub>2</sub>; thus, Phaistos sign 25, ro. Phaistos signs 01-03 and 06 received mnemonic values: vir (man), hawk (for Mohawk hairstyle), head, and mul (woman). Phaistos signs 03-05, 11, 15, 17, 21, 28, 30, 42-44 each appears once on the disc, so I gave them rare values in Linear AB (the j-series and syllables beginning with two consonants).

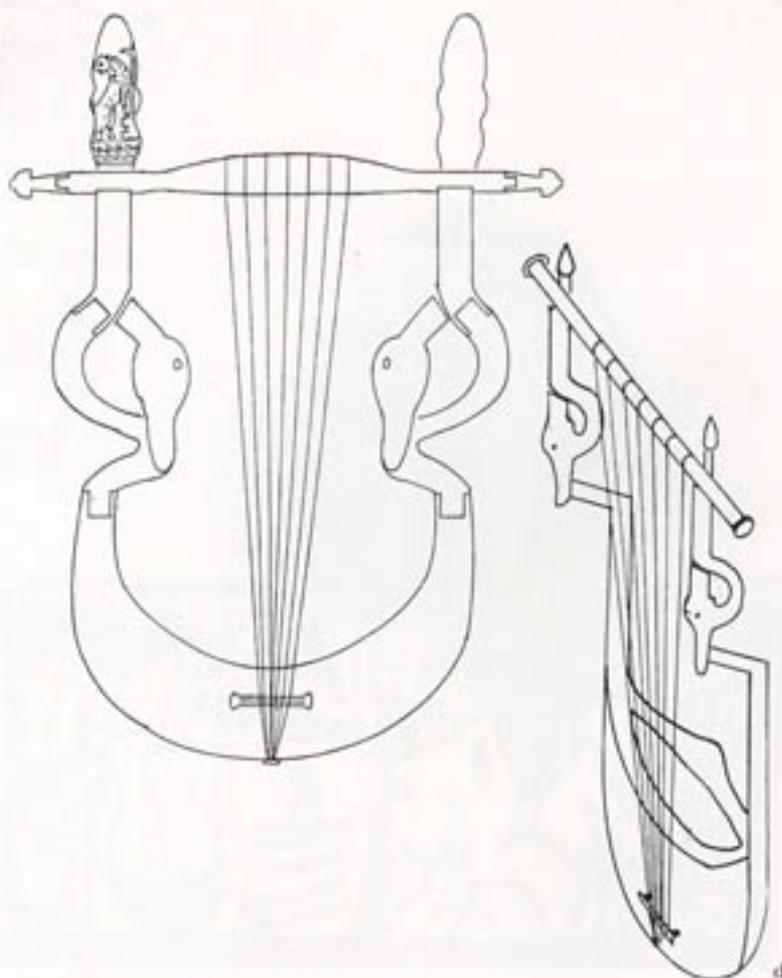
## LIST OF ILLUSTRATIONS

- Pl. I Terracotta sistrum from Archanes Phournoi (MM 1A context), photo by the author.  
 Pl. II Excavation of a lyre from Phylakopi, Mycenaean Sanctuary, East Shrine, photo by the author.  
 Pl. III *CMS* II 2, no. 33, from Knossos, *CMS* drawing of the impression.  
 Pl. IV Reconstruction drawing of a Mycenaean phorminx, drawing by the author.  
 Pl. V Drawing of the lyre arm and bridge from Mycenae ChT 81, by the author  
 Pl. VI Late Geometric sherd from Paros (Paros Museum), photo by the author.  
 Pl. VII The lyre-player on the Ayia Triada sarcophagus, drawing by the author.  
 Pl. VIII Reconstructed lyre from the Menidi tholos, photo by the author.  
 Pl. IX Reconstruction drawing of the Menidi lyre finials, by the author.  
 Pl. X Reconstruction drawing of the Pylos lyre player, by the author.  
 Pl. XI Pyxis from Chania (Chania 2308), early LM IIIB, drawing by the author.  
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 Pl. XIII Reconstruction drawing of the Harvester vase, by the author.  
 Pl. XIV Detail of the Harvester vase, sistrum shaker and singers, photo by the author.  
 Pl. XV The Harvester vase “march-song.”  
 Pl. XVI Athens National Museum 1327, red-figure cup, tondo, photo by the author.  
 Pl. XVII HT Zd 156, Linear A graffito, with translation into fractions, ratios, and corresponding musical intervals based on alto C.  
 Pl. XVIII Top row: tuning up by 5ths and down by 4ths. Bottom row: the musical intervals implied by the Linear A graffito, HT Zd 156.  
 Pl. XIX Phaistos Disc, Side A, with repeated syllable-clusters encircled.  
 Pl. XX Phaistos Disc, Side B, with repeated syllable-clusters encircled.  
 Pl. XXI Phaistos Disc, Side A, with repeated signgroups underlined.  
 Pl. XXII Phaistos Disc, Side B, with repeated signgroups underlined.  
 Pl. XXIII Phaistos Disc, complete text rendered as a “dummy” text.



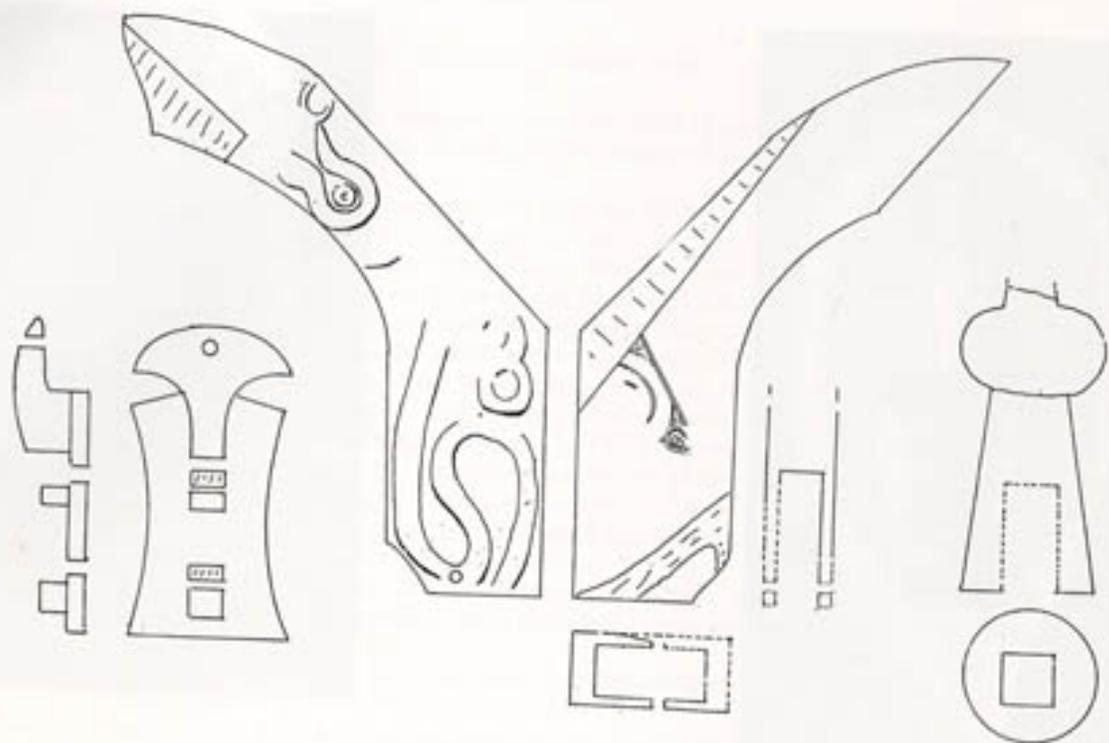
a

b



c

d



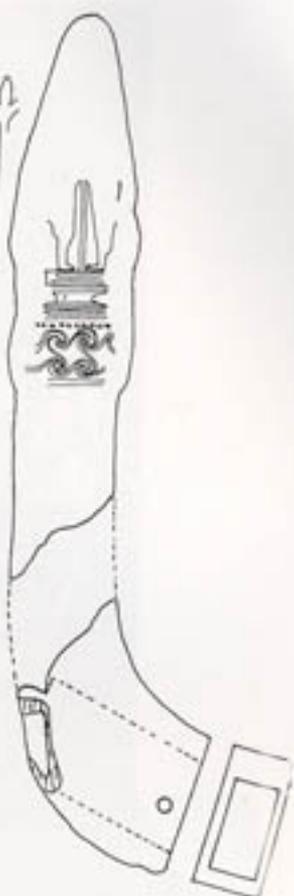
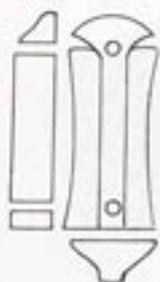
b



c



a



b



c



d





a

Unit	Grafitto	Value	Ratio	Pitch
	NE I	1	<b>1</b>	C
$1.50 * 1 = 1.50$	NE I J	$1 \frac{1}{2}$	<b><math>\frac{3}{2}</math></b>	G
$1.50 * 1.50 = 2.25$	*319 2 E	$2 \frac{1}{4}$	<b><math>1 + \frac{5}{4}</math></b>	E'
$1.50 * 2.250 = 3.375$	*319 3 E F	$3 \frac{1}{4} \frac{1}{8}$	<b><math>2 + \frac{11}{8}</math></b>	$\uparrow F'$
$1.50 * 3.375 = 5.0625 = 5 \frac{1}{16}$	TA-JA K	"FIVE" $\frac{1}{16}$	<b><math>4 + \frac{17}{16}</math></b>	$\sim C\#'$

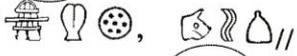
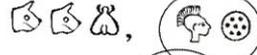
b

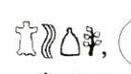
tuning up by 5ths, down by 4ths



musical intervals implied by HT Zd 156

c

- A1   //
- A2  //
- A3      •  //
- A4  //
- A5  //
- A6    //
- A7  //
- A8  //
- A9       //
- A10      //

- B1    //
- B2   //
- B3         //
- B4  //
- B5  //
- B6   //
- B7   //
- B8    //

a

b

- A1 : ㊦㊦|㊦>||
- A2 ㊦㊦㊦, ㊦㊦㊦||
- A3 ㊦㊦㊦, ㊦㊦㊦㊦, ㊦㊦㊦㊦, ㊦㊦㊦, ㊦㊦㊦>, ㊦㊦, ㊦㊦㊦㊦, ㊦㊦㊦㊦, ㊦㊦㊦||
- 
- A4 ㊦|, ㊦㊦㊦㊦|>, ㊦㊦||
- A5 ㊦㊦㊦||
- A6 ㊦㊦㊦㊦|, ㊦|, ㊦㊦㊦||
- A7 ㊦㊦㊦㊦|>, ㊦㊦||
- A8 ㊦㊦㊦||
- A9 ㊦㊦㊦㊦>㊦, ㊦>㊦, ㊦㊦, ㊦㊦㊦, ㊦㊦||
- A10 ㊦㊦, ㊦㊦㊦㊦|, |㊦, ㊦㊦

- B1 : ㊦㊦㊦㊦, ㊦㊦㊦, ㊦㊦||
- B2 ㊦㊦, ㊦㊦㊦, ㊦㊦||
- B3 |㊦>, ㊦㊦㊦, ㊦㊦, ㊦㊦㊦, ㊦㊦㊦, ㊦㊦㊦, ㊦㊦㊦, ㊦㊦, ㊦㊦, ㊦㊦||
- 
- B4 ㊦|, ㊦㊦||
- B5 ㊦㊦㊦||
- B6 ㊦㊦㊦, ㊦㊦, ㊦㊦||
- B7 ㊦㊦, ㊦㊦㊦||
- B8 ㊦㊦>, ㊦㊦, ㊦㊦, ㊦||

- A 1 haw<sup>k</sup>-qe-boo-vir-de  
 A 2 dum-shu-qe, ma-doo-di  
 A 3 ma-ma-bih, haw<sup>k</sup>-qe-kwa-shu-wap, na-doo-di-qe, na-cha-coo, haw<sup>k</sup>-qe-mul-de-\*, ri-fa-teh,  
 haw<sup>k</sup>-qe-pu-sa-teh, vir-pu-shu-di, haw<sup>k</sup>-qe-to-ni-la
- 
- A 4 ra-ji, haw<sup>k</sup>-na-ro-mu-ni-de, kwi-vir  
 A 5 haw<sup>k</sup>-qe-ri-fa  
 A 6 haw<sup>k</sup>-qe-na-na-teh-so-pta, wap-ni, haw<sup>k</sup>-qe-ri-fa  
 A 7 haw<sup>k</sup>-na-ro-mu-ni-de, kwi-vir  
 A 8 haw<sup>k</sup>-qe-ri-fa  
 A 9 haw<sup>k</sup>-qe-na-ko-to-de-na, mul-de-nwa-sa, ri-fa-qe, haw<sup>k</sup>-qe-boo-vir, ni-sa-teh  
 A 10 **mu-head-la**, haw<sup>k</sup>-qe-na-na-teh-so-pta, boo-vir, **mu-head-la**
- B 1 haw<sup>k</sup>-qe-fi-shu-di, na-doo-di-teh, haw<sup>k</sup>-so-ni-ju  
 B 2 fi-ro-na, wap-dum-no-qe, kee-ni-de-nwo  
 B 3 boo-vir-ra-wap, joe-di-boo-vir-de, fi-so-pto-ro, di-dum-shu-teh, haw<sup>k</sup>-fa-ba-shu,  
 na-ro-la-vir, ma-dum-dum-no-teh, kee-ko-de,  
 ma-wap-vir, mul-teh-to-ra-wap, haw<sup>k</sup>-tee-na-vir, **ma-ba-di-coo**
- 
- B 4 ma-coo-boo, ma-doo-di  
 B 5 fi-**ma-ba-di-coo**  
 B 6 na-bih-ni-ro, di-de-teh, di-doo-di  
 B 7 di-ni-de-dum, fi-**ma-ba-di-coo**  
 B 8 tee-kwo-ra-de-di, haw<sup>k</sup>-mul-teh-ni-di, ma-bih-ni-ro, doo-di