

A Lyre from the Cemetery of the Acharnian Gate, Athens

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ZUSAMMENFASSUNG

Bei bisherigen Nachbauten der antiken griechischen Leier vom Typ der Chelys (Phaklares, Courbin, Roberts, Bélis, Prohászka) wurden die Arme des Instruments mit Nägeln an dem aus einem Schildkrötenpanzer hergestellten Resonanzkörper befestigt, oder mit innenliegenden Verstrebungen verschiedener Art, die teilweise an den Panzer genagelt wurden. Ein neuer Fund in einem Grab aus klassischer Zeit auf dem Friedhof des Acharnischen Tores in Athen legt jedoch eine andere Konstruktionsweise dieses Instrumententeils nahe: Zwei große Löcher sind symmetrisch neben der Längsachse des Panzers an Stellen eingelassen, wo sich das untere Ende der Arme befinden sollte. Das lässt vermuten, dass die Arme in diese Löcher „gesteckt“ und nicht mit Nägeln oder auf andere Weise im Innern mit dem Schallkörper verbunden wurden. Ähnliche Löcher, die in anderen, bisher unveröffentlichten Lyrapanzern entdeckt wurden (Lecce, Poseidonia und vermutlich Ambrakia II und Lokroi I), unterstützen diese Interpretation.

1. THE GRAVE AND ITS CONTENT

Over the years 1985–1988, salvage excavations in a central square of Athens (Kotzia or Town Hall Square), just outside the Acharnian Gate of the Themistoclean walls (built in 479 BC) of the ancient city, brought to light ancient roads, cemeteries, ceramic workshops and kilns, spanning a period from Protogeometric to Late Roman times¹.

In one of the graves of the Classical cemetery (No 109, now destroyed), made out of marble slabs, essentially a sarcophagus², a number of artifacts were found around a skeleton. The objects were undoubtedly grave offerings: six white-washed funeral jars (*lēkythoi*)³; four small bottles with remnants of an unidentified, as yet, ochre

coloured substance⁴; a “plastic” *lēkythos* in the shape of a scallop (sea shell of the *pecten* kind)⁵; two bone styli (*graphidai*)⁶; seventy-seven knuckles (*astragaloi*)⁷; a piece of leather⁸; three small jars of alabaster (*alabastra*)⁹; a number of metal pieces belonging to body scrappers/strigils (*stleggidai*)¹⁰; a pottery jewelry box (*pyxis*) without its lid¹¹; a bronze pin¹²; the plaques of a disjointed tortoise carapace¹³ and, finally, a few small iron pieces¹⁴ (the latter belonging, as will later be shown, with the carapace¹⁵). The excavator suggested, right

¹ See Ζαχαριάδου/Κυριακού 1993, 25 Σχέδ. 1 for a topographic plan of the excavated area; 22–29 for a brief description of the finds.

² A detailed description of the grave at the moment of excavation, including dimensions of the sarcophagus, is given in the excavators’ hand written Diary (henceforth called the Excavation Diary), 55–71. The excavation was carried out by the Third Ephorate of Prehistoric and Classical Antiquities, Athens, and Ms Olga Zachariadou was the archaeologist in charge.

³ Items OM 109/1tθ, 1tκ, 1tκα, 1tκβ, 1tκγ, 1tκδ in the Excavation Diary. See Ζαχαριάδου/Κυριακού 1993, 27 with Πίνακας 32β for a photograph of the *lēkythoi*.

⁴ Items OM 109/1δ, 10, 1t, 1tβ in the Excavation Diary.

⁵ Item OM 109/1tδ in the Excavation Diary. For the *pecten* shell and its use as a popular motif in the plastic arts of ancient Hellas see Delamotte et al. 1994, 292; 33–35.

⁶ Items OM 109/1β, 1γ in the Excavation Diary.

⁷ Collectively, Item OM 109/1tη in the Excavation Diary.

⁸ Item OM 109/1α in the Excavation Diary. This piece of leather was found lying on the right side of the chest of the skeleton.

⁹ Items OM 109/1στ, 1ζ, 1η in the Excavation Diary.

¹⁰ Collectively, Item OM 109/1ε in the Excavation Diary.

¹¹ Item OM 109/1τα in the Excavation Diary.

¹² Item OM 109/1tγ in the Excavation Diary.

¹³ The carapace plaques are collectively grouped as Items OM 109/1tε and 1tστ in the Excavation Diary, and they are regarded as belonging together.

¹⁴ These are not mentioned in the Diary, but are stored together with the carapace.

¹⁵ Sincere thanks are due to the Director of the 3rd Ephorate of Prehistoric and Classical Antiquities, Athens, Ms Nikola Valakou, for granting me permission to study the carapace, and especially to archaeologist Ms Olga Zachariadou,

away, that the carapace was part of a lyre¹⁶. In what follows the carapace will be examined in all significant detail. First, the excavator's claim, namely, that it belonged to a lyre, will be proved, and an attempt will subsequently be made to reconstruct the instrument.

The skeletal remains were interpreted by Professor Theodōros Pitsios, physical anthropologist in the University of Athens, as belonging to a teenager (about twelve years of age), who probably died of a disease that caused an enlargement of his head (hydrocephaly)¹⁷. Because of the young age of the deceased, examination of the skeleton could not reveal the sex of the person. However, the presence of strigils in the grave suggests the deceased was a boy.

The burial has been dated by the excavator as the third quarter of the 5th century BC (450–425 BC)¹⁸, in the classical period, on account, undoubtedly, of the white-washed funeral jars (*lēkythoi*), which were only in that period produced and placed as offerings in graves.

2. THE RESTORATION OF THE CARAPACE

The carapace was reconstructed out of numerous plaques¹⁹. Initially, the plaques underwent chemical treatment, in order for them to be cleaned and strengthened. Briefly, the steps followed were the following: 1) mechanical removal of soil; 2) partial bleaching with hydrogen peroxide (H₂O₂), and removal of hydrogen peroxide excess with water (H₂O), natural or ionized; 3) dehydration with ethanol (CH₃CH₂CH); 4) enriching with acetone solution of polyvinyl acetate (P.V.Ac.); 5) drying; and 6) cleaning with acetone ((CH₃)₂C=O). The plaques which had lost some of their natural curvature, and thus made reassembly difficult, underwent special treatment, in order for them to regain their original curvature. They were: 1) soaked in acetone solution of polyvinyl acetate (P.V.Ac.); 2) placed in burning hot olive-oil; and 3) cleansed of the oil excess with benzene (C₆H₆)²⁰. The plaques were subsequently pasted together²¹, to form a practically complete shell (without the breast plate) (Fig. 1)²².

The restoration of the carapace plaques in their original position seems to have been carried out correctly, although the final product is not exactly symmetrical about a longitudinal axis (as all natural tortoise carapaces always are): the central, 'spinal' plaques form a curve instead of a straight line (Fig. 1). Similarly, the sides of the shell are not exactly symmetrical: one is steeper than the other. One can, of course, understand the difficulty of assembling in absolute symmetry this three

dimensional 'jig-saw puzzle'. What is important, however, is that the plaques have resumed their original position in the shell, so that measurements (approximate) can be taken, and other features appreciated.

As regards the species to which the carapace belongs, this can be neither the *testudo hermanni* ('Hermann's tortoise')²³, because the central tail plaque is not divided into two symmetrical halves, nor the *testudo marginata* ('marginated tortoise'), since it lacks the characteristic 'fan' tail of the type²⁴. The typology of the shell agrees with that of the *testudo graeca* ('spur-thighed tortoise'), a

who most generously gave me access to the Excavation Diary and the Restoration Diary, and discussed with me aspects of the moveable finds. I should also like to thank the archaeologist Ms Philia Pasadakē, in the Laboratory of the Ephorate, for her friendly reception, and the restorer Mr Apostolos Lamprinos, for sharing with me his knowledge on restoration.

¹⁶ Excavation Diary, p. 67: «ἀπὸ μουσικῶ ὄργανο, λύρα(;)».

¹⁷ Information from personal contact with Professor Pitsios. 'The American Heritage Dictionary' (Morris 1969) of the English Language defines hydrocephaly as "the usually congenital condition in which an abnormal accumulation of fluid in the cerebral ventricles causes enlargement of the skull and compression of the brain". It is of interest, though without any consequence here, that the 40–45 year old musician of Metapontion (see below) suffered from acromegaly, which should have caused a substantial lowering of the vocal register (Prohászka 1995, 150).

¹⁸ Excavation Diary, p. 71.

¹⁹ The restorer of the Ephorate responsible for the preservation of the carapace, Ms Chrysanthē Apostolopoulou, kept a detailed Restoration Diary, already referred to, carefully notating, day by day, the stages of restoration.

²⁰ I should like to express my thanks to Assistant Professor Nikos Psaroudakēs, Faculty of Chemistry, University of Athens, for his help with chemical terms and formulae.

²¹ A kind of epoxy glue seems to have been used for the purpose (Figs. 1–2). Here and there small gaps between the plaques have been filled in with the same, dark brown, glossy, epoxy glue (Fig. 3). Fortunately, not many such gaps exist, and in any way these are not to be found in significant places on the shell, as will later become apparent, when we shall examine the holes drilled in it.

²² It is not exactly clear from the Restoration Diary how many 'free' plaques were retrieved from the grave. Individual plaques are numbered as 1, 2, 3 etc. up to 9, but at some point the expressions "cleaning of the shell" (Rest. Diary, 8.4.86) and "dehydration of the shell" (Rest. Diary, 11.4.86) – as opposed to 'plaques' – suggest that, at least, one part of the carapace was found with its plaques still held together. It cannot be deduced from the two Diaries which part of the carapace this "shell" might have been; the photographs taken before restoration work was carried out were not available.

²³ The species lives in the Mediterranean shores of Europe. Its carapace reaches a length of about 20 cm (Κιορτσής 1996, 60).

²⁴ Of the three European species, the *testudo marginata* is endemic to Hellas. It is to be found on the mainland, south of Mt Olympos, and in some islands of the Aegean. It has the longest carapace of the three, measuring up to 25–30 cm (Κιορτσής 1996, 60). Another carapace, believed to have been part of a lyre, and found in Epizephyrioi Lokroi, South Italy (here called 'Lokroi I'; see below and Fig. 20), is

fairly deep shell, with relatively vertical sides and single central tail plaque, which lives in Spain, Italy, Hellas and the rest of the eastern Balkans, Armenia and the west coast of the Caspian Sea, and, possibly, in Asia Minor²⁵. A purely Hellenic provenance of the carapace cannot, therefore, be established, although it is likely this may be the case²⁶.

3. OTHER ARCHAEOLOGICAL TORTOISE CARAPACES

A number of carapaces have been found, mostly in graves. Some of them have been published, others are merely mentioned in the literature, with or without a photograph or sketch, while a few of them are recent finds and are unpublished. In the ensuing analysis, reference will be made to the following carapaces:

- Carapace (semi-complete) from Daphnē (here called ‘Athens III’), Grave/found 1981/dated as the second half of the 5th century BC/Peiraias, Archaeological Museum 7457²⁷.
- Carapace (fragmentary) from Argos, depository of a sanctuary/found 1956/dated as Late Archaic/Argos, Archaeological Museum A56, U14 Tortus 2/Photograph in Courbin 1980, 99, Fig. 8²⁸.
- Carapace (practically complete – *testudo hermanni*) from Bassai, Temple of Apollōn Epikourios/found 1976/dated as the first half of the 5th century BC/Olympia, Archaeological Museum Δ 829; ex Athens, National Archaeological Museum O.76.9 (see Fig. 14)²⁹.
- Carapace (fragmentary) with iron tailpiece from Ambrakia (here called ‘Ambrakia I’), Cemetery of Koutsomyta, Grave 39/found 1957/dated as the second half of the 5th century BC/Arta, Archaeological Museum AE 1179 (see Figs. 15–16)³⁰.
- Carapace (nearly complete) from Ambrakia (here called ‘Ambrakia II’), S. W. Cemetery/dated as Classical/Arta, Archaeological Museum AE 5646 (see Fig. 17)³¹.
- Carapace (nearly complete) in Lecce/Lecce, Archaeological Museum (see Fig. 18)³².
- Carapace (nearly complete) from Poseidōnia (here called ‘Poseidōnia I’), ‘Tomba di Tufatore’/dated as Late Archaic, early 5th century BC/Paestum, Archaeological Museum (see Fig. 19)³³.
- Carapace with tailpiece from Metapontion, Pantanello Necropolis, Tomb 336/found 1981–84/Metaponto, Archaeological Museum/Photograph in Prohászka 1995 pl. 41 (see Fig. 24)³⁴.
- Carapace (almost complete – *testudo marginata*) with iron tailpiece from Epizephyrioi

Lokroi (here called ‘Lokroi I’), Necropolis of Lucifero/found 1916/dated as the beginning of the 5th century BC/Reggio, Archaeological Museum (see Figs. 20–21)³⁵.

4. FEATURES OF THE CARAPACE

1. Looking at the shell from its convex side (Fig. 4), four holes are discernible on some of the rim plaques of the tail end of the shell (labeled A, B, C, D in Fig. 25). All four of the holes lie on the same side of the shell, and are of practically equal diameter (ca. 2.5 mm). Their distances from the edge of the rim are: 0.61, 0.7, 1.1, 1.05, and 1.05 cm, respectively.

2. At the apex of the shell (Figs. 1, 25) another hole (E) is to be found, of a slightly smaller diameter: 2.48 mm.

3. A tiny little hole (F), visible on close inspection only (Figs. 1, 25), too small to be measured, is located to the left of the apex hole. The question arises whether this tiny hole was purposefully drilled for some reason, or whether it is the product of material decay (taphonomy). There does not seem to be another such hole on the other side of the shell.

4. At the head end of the shell (Fig. 5), a set of four holes (G, H, I, J) is to be seen on the middle plaque. They are called a ‘set’, not because it is decided that they somehow belong together, but because of their similarity in size, proximity and

described as belonging (most probably) to the species *testudo marginata*. Since the species is endemic to Hellas, the logical inference is that the Lokroi I instrument was manufactured in Hellas and imported to the colony (according to Φάκλαρης 1977, 225 n. 17).

²⁵ Lambert 1997 excludes Asia Minor, while Kiortsēs (Κι-ορτσής 1996, 60) includes it.

²⁶ I should like to thank the zoologist Ms Rosa Polymenē, of the Department of Zoology of Athens University, for all her enthusiastic help in establishing the species of the ancient carapace, going as far as comparing the find with specimens of the three European species kept in the Department, and providing me with up to date relevant bibliography.

²⁷ Publication in preparation by the present writer.

²⁸ Published by Courbin 1980.

²⁹ Published by Φάκλαρης 1977.

³⁰ Published by Φάκλαρης 1977.

³¹ Unpublished.

³² Unpublished.

³³ Unpublished.

³⁴ Published by Prohászka 1995.

³⁵ Presented in Orsi 1917. Another two graves in the Lucifero Cemetery (Nos 996 and 1143) have each yielded a similar carapace together with a metallic tailpiece, dated as the beginning of the 5th century BC (‘Lokroi II and III’).

symmetrical placement on the shell. These are, essentially, two pairs of similar holes (diameter 3.16 mm), symmetrically positioned to each other about the longitudinal axis (centres of lower holes at 2.1 cm from each other; centres of upper holes at ca. 2.67 cm from each other; distance between upper and lower pairs of holes, ca. 8 mm). The slit appearing between the pairs (Fig. 5) is undoubtedly the result of human operation on the plaque (length 8.46 mm; gap at the rim 1 mm); it is not a feature to be found on natural tortoise carapaces. Its significance cannot be waged.

5. There are two more holes (K and L; centres at a distance of 6.4 cm from each other), of similar diameter (8.16 mm), symmetrically disposed about the longitudinal axis (Figs. 5, 25), and drilled on adjacent plaques to the central one (distances of centres from rim edge: 2.176 cm for K; 1.8 cm for L). Through them pass cylindrical, metallic members (here termed items a and e, respectively), rising from the shell at an angle of ca. 2 degrees to the vertical through the holes, obviously broken at both ends (surviving protrusions of elements from the walls of the shell: 4.12 mm external, 5 mm internal for K; zero external, 1.814 cm internal for L). The internal protrusions create between them an angle of ca. 25 degrees (Fig. 6). The curved, fractured end of one of the loose metallic elements found with the shell (item b; Figs. 7, 25) fits exactly the broken end of the metallic element rising through hole K: item b, therefore, is undoubtedly the continuation of item a. Furthermore, the resulting curved shape of this combination, a+b, matches the shape of another metallic element (item d), the curved end of which, undoubtedly, broke off the metallic element through hole L (item e), although the corroded surfaces at this break do not afford a complete match. Item c, another metallic element, seems to be the missing link between a+b and d, thus creating a π -shaped contrivance with curved 'legs', which were inserted into the carapace through holes K and L (Figs. 8, 25). Three more small metallic pieces (items f, g, h), fairly corroded, may have flaked off this contrivance. The size of the straight part of the restored metallic element (a+b+c+d) is compatible with the distance between holes K and L, namely 6.4 cm, a fact which further supports the proposed restoration (Fig. 25). Shape, material and position (at the head end of the shell) of the element suggest that it is to be identified with the tailpiece (*chorodotonos*) of a lyre (of the *chelys/barbitos* type).

6. A pair of large, oval holes (M, diam. 0.92 x 0.776 cm; N, diam. 1.052 x 0.852 cm), open at an angle to the walls of the carapace are to be found in the peripheral plaques towards the head end of the

shell, and are symmetrically placed about the longitudinal axis of it (Figs. 6, 11–12, 25). These holes are by far larger than all the holes on the shell we have so far examined, and this suggests that their function was of a different kind. The angles at which the holes are pierced are very large with respect to the shell at these points, suggesting that, if an element of some kind passed through them, this must, to all probability, have had a more or less top-to-bottom direction, approximately parallel to the longitudinal axis of the shell (the arms of the lyre, perhaps?).

7. The breast plate of the carapace was not found in the grave, which, most probably, means that it was removed during the manufacture of the instrument. It is clear (Fig. 13) that the breast plate was not sawed off along a straight line. A comparison with a modern shell³⁶ shows that the breast plaques were separated from the lateral ones along their natural seams. Hence the undulating line along the rim of the shell, on both sides (Figs. 3, 13). The edge of the resulting rim rises towards the head end, and it then suddenly drops substantially towards the middle plaque (Fig. 5). This is, perhaps, why the four holes (G, H, I, J) were opened in the middle plaque, so that the skin (sound board) could be pulled onto the shell and tied to it by laces, thus securing its tightness.

8. Quite a number of indentations, parallel, slightly curved lines are clearly evident on the interior surface of the carapace, above and on the left of oval hole N, running up to the edge of the rim (Fig. 10). On the analogous adjacent side similar lines are just discernible, however to a lesser extent; the surface of the plaques here is worn off, so we cannot have the original state of things. No doubt, they are man made, but to what purpose it is not clear. All that could be said is that because they are in the vicinity of the holes where the arms end (according to the reconstruction proposed here, see below with Fig. 25), we may somehow associate them with the arms.

5. ANALYSIS AND RE-CONSTRUCTION

1. Holes A, B, C, D (tail end rim of the carapace; Fig. 4), as already said, are segregated on the same side of the carapace, and the pertinent question is: why this segregation and to what purpose? Similar peripheral holes are to be found on some other carapaces. On Lokroi I (Fig. 20), they occupy the entire arch of the tail end, while a few more are at

³⁶ A modern *testudo graeca* belonging to the present writer.

the head end. Also, on Ambrakia I (Fig. 15) peripheral holes exist on all of the surviving plaques. Ambrakia II (Fig. 17) and the Bassai (Fig. 14) and Metapontion (Fig. 24) shells do not feature them³⁷. As for the Lecce shell, the tail side has perished, so we lack the evidence from there. Another Athenian shell, however, (Daphnē/‘Athens III’), does have a whole set of these holes along the arch of its tail end. It has been suggested³⁸ that through such peripheral holes passed leather thongs or laces, with the aid of which the skin was tied onto the shell and kept taught, which seems to be a plausible interpretation³⁹.

2. Hole E (apex). A central hole is also to be found on Lokroi I (actually, two holes, one at the apex and another towards the head end; Fig. 20), and on the Bassai shell (not exactly at the apex, but more towards the tail end; Fig. 14). On Ambrakia II (Fig. 17), there is no such hole at the apex, but there might have been one further up, towards the tail end, where there is a plaque now missing⁴⁰. The central plaques of Ambrakia I (Fig. 15) have perished.

3. Hole F (to the side of hole E). Holes near the centre of the tail end of the shell are to be found only on Lokroi I (Fig. 20), but this time there are two of them, symmetrically placed about the longitudinal axis, and not of such small diameter. A similar pair of holes is also to be found further down this carapace, a feature absent from our shell. The use of these holes cannot easily be decided. Perhaps, they should be associated with an internal contrivance, which secured the arms-yoke system onto the carapace⁴¹.

4. Holes G, H, I, J (head end, middle). Similar ‘sets’ of four holes at the centre of the head end of the carapace (Figs. 5, 25) are not to be found on any other such find: this is a unique feature of our shell. It is not obvious what function they fulfilled. Perhaps, these holes, like those on the rim of the tail end (A, B, C, D), were used in tightening the skin onto the shell with the help of laces. However, it is not clear why a second pair, further away from the rim edge, was needed for that (see further discussion below).

5. Metallic element a+b+c+d+e (tailpiece). Further, external, evidence in support of the identification of the metallic contrivance with a lyre’s tailpiece comes from the Lecce carapace (Fig. 18), where the metallic tailpiece, despite its extensive corrosion, survives complete and in its original position on the shell. Similar (loose) metallic elements are reported in the literature as having been found together with tortoise carapaces: one together with Ambrakia I (Figs. 15–16), and three more together with Lokroi I, II and III⁴².

In Ambrakia I, together with the shell was found an iron bar (4.9 cm extant length; 6 mm thick), bent at right angles at its one end (Fig. 16). Iron rust was also detected on the convex surface of the shell, near a pair of holes at the head end (Fig. 15). This piece of evidence suggests that the metallic element was most probably a tailpiece⁴³.

In Epizephyrioi Lokroi, all three carapaces were found together with iron bars, which have been interpreted as tailpieces⁴⁴. These bars are π -shaped (Fig. 21), like the present tailpiece (Fig. 8).

Iron rust has also been detected on the Bassai shell, which has also been thought to have been the soundbox of a lyre: lines of iron rust run from two small holes drilled at the head end of the shell to the rim, traces, undoubtedly, of a perished iron tailpiece⁴⁵.

“Six corroded iron fragments found with the lyre” in Metapontion (Fig. 24) were thought of as parts of the tailpiece of the instrument⁴⁶. They were not attached to the carapace in any fashion but they were “found on the soil around the shell”⁴⁷. The proposed reconstruction is odd, because a tailpiece with ‘antennae’ is unprecedented, both amongst the other tailpiece finds and the iconography⁴⁸.

³⁷ For the absence of peripheral holes in the Metapontion shell see Prohászka 1995, 150.

³⁸ Φάκλαρης 1977, 226; Dumoulin 1992a, 106; Prohászka 1995, 149. Roberts (1981, 310), alternatively, throws in the (unlikely, especially for the Acharnian Gate shell, where the holes are few and segregated in one place) suggestion that these peripheral holes might have been sockets for small pegs, similar to those on the modern African *kora*. There is no reference in Roberts to literature on the *kora*. King (1991), in his article on the *kora* in the new Grove dictionary of music and musicians, does not mention any such pegs being used to secure the skin onto the gourd resonator: “the leather on the back of the resonator may be embellished with metal studs”.

³⁹ However, an even dispersal of the holes around the rim (as in, e.g., the cases of Lokroi I, Fig. 20, and Ambrakia I, Fig. 15) would have been a more logical arrangement of them, for the purpose of securing the skin onto the shell.

⁴⁰ The Bassai shell (Fig. 14) does have a hole in this position. The Lokroi I carapace (Fig. 20) has lost the corresponding plaque.

⁴¹ Phaklarēs (Φάκλαρης 1977, 225 with Fig. 7), in his description of the Lokroi I carapace, draws attention to this, upper (towards the tail end), lateral pair of holes, but he does not attempt to interpret their function on this particular carapace. He bases his reconstruction (p. 226; 227, Fig. 8) on the Bassai shell alone, in which, a second, higher, pair of lateral holes is not to be found. It must, of course, be pointed out that the Bassai carapace is very small, only 15 cm in length, while Lokroi I is significantly longer, 30 cm (Roberts 1981, 303), and it is reasonable to think of the second pair of lateral holes here as a necessity for better fastening of the arms onto the carapace.

⁴² See n. 35.

⁴³ Φάκλαρης 1977, 223.

⁴⁴ Φάκλαρης 1977, 225; 228 n. 18.

⁴⁵ Φάκλαρης 1977, 221–222.

⁴⁶ Prohászka 1995, 145.

⁴⁷ Prohászka 1995, 151.

⁴⁸ See reconstruction of the Metapontion lyre (sketch) by Prohászka 1995, 146, Figs. 34–35, reproduced here as Fig. 24.

Whether or not, in the case of our carapace, the embedded metallic ends were longer than the surviving length (max. 1.8 cm of b) is not known (Fig. 10). However, the fact that no more metallic elements were found, suggests that, most probably, they were not longer than about 2 cm. The question arises: are we to think of the embedded ends as nailed into the wooden arms of the lyre along their lengths inside the carapace, or are we to dissociate the two? This idea comes from Bo Lawergren's unpublished report at a conference in Eressos, Lesbos in 2000, of carapaces found in Metapontion and Poseidōnia, in which the great length of the internal antennae of the metallic tailpieces found with them suggest that they were inserted into the lower ends of the arms, forming thus a rigid frame: arms-yoke-tailpiece. Such a construction, admittedly, would have relieved the carapace from stresses and strains imparted by the arms and the tailpiece on the shell, due to the tension in the strings. The shell would have been 'hanging' from the resulting frame, not being a part of it at all, serving only as a sound magnifier; a very attractive proposition. Whether we are here faced with a similar construction or not will be discussed later, after the next feature of the shell will have been considered.

6. Holes M, N (large, oval). What immediately comes to mind is that these holes might have served as 'pockets', receiving in them the lower ends of the arms of a lyre: an effective way of 'locking' into position the yoke-arms wooden system onto the carapace, taking advantage of the tension of the strings, which connect yoke to tailpiece (Fig. 25)⁴⁹. If we accept this reconstruction however, we must abandon the possibility of the tailpiece internal 'prongs' piercing the arms along their lengths, an idea that was posited earlier (under 5). The steep angle of the prongs, however, sticking out of the interior of the shell almost vertically (Fig. 10), leaves no doubt that they could not have been inserted into the arms, at least longitudinally. It is, therefore, more natural to conclude that in this case arms and tailpiece were separate pieces, and not forming a frame with the yoke (Fig. 25). The reconstruction proposed here is in agreement with that of Phaklarēs' (Fig. 22⁵⁰), which was based primarily on the carapace from Bassai, in so far as the tailpiece ends are not inserted into the arms. However, there is a significant difference between the two reconstructions: Phaklarēs nailed the arms onto the carapace, considering the fact that traces of iron rust were found around the periphery of the relevant holes, while in our case, the holes are much larger than those of the Bassai carapace, and it thus seems unlikely that nails were used for securing the arms onto the

shell. It is much more probable that, as has already been suggested, the ends of the arms, adequately thinned down, were pushed into the holes, where they came to a halt, without the use of any further fastening material, such as nails (Fig. 25). The protruding ends of the arms could have then been concealed, if necessary, under the rim of the skin.

Similar, large, oval holes, in the same places, are to be found on the Lecce carapace (Fig. 18). Although the larger of the two diameters of the holes is not in the direction top-to-bottom, as it is in our shell, but the other way round, it is very likely that here, too, the holes functioned as 'brackets' for the lower ends of the arms. The same applies to the Poseidōnia shell (Fig. 19), where a large hole is discernible in the relevant position on the side of the shell⁵¹. Similar, large openings are to be found on Ambrakia II (Fig. 17), and also on Lokroi I (Fig. 20), although, in the latter case, the holes are much smaller and irregular, resembling more those on the Bassai carapace (Fig. 14).

There have been several attempts at reconstructing 'the' *chelys* or one particular find of this type of lyre. Phaklarēs⁵² based his study on the Bassai, Lokroi, Argos and Ambrakia I shells, none of which have in them the large oval holes found in those from Poseidōnia and Lecce (Ambrakia II is a recent find). Guided by the small holes on the Bassai shell with rust around their rims, he nailed the arms directly onto the carapace, as has already been said. We must, however, remember that the Bassai shell is very small indeed, much smaller than any of the other surviving shells. It seems that in the case of the small Bassai carapace, this was indeed the way the arms were joined to the soundbox.

Courbin, in his reconstruction of the Argos lyre⁵³, assumed that the arms were 'caged' inside a semispherical 'harness', made of two curved cylindrical elements, inserted into the four (extant) perforations in the shell. However, much of the shell is missing, so this particular find should not be regarded as a good piece of evidence for the way the arms were attached to the soundbox.

⁴⁹ Interestingly enough, extant specimens of Pharaonic (wooden) kitharas of the New Kingdom (e.g. kithara in the Ägyptisches Museum zu Berlin Inv. No 7100, 19th Dynasty, ca. 1200 BC, see Fig. 26) have their arms go through holes in the base.

⁵⁰ Φάκλαρης 1977, 227 Σχέδ. 8α-β.

⁵¹ The Poseidōnia carapace has not been published. The photograph given here (Fig. 19) was taken by Conrad Steinmann, and was kindly offered to me for the purposes of this paper. I thank him very much for his generous gesture. A photograph of the other side was not available, so certainty cannot here be expressed of the existence of another such hole on the other side.

⁵² Φάκλαρης 1977, 229 Σχέδ. 10α-β.

⁵³ Courbin 1980, 105, Figs. a-c.

Roberts, based her reconstruction of the *chelys* on the Elgin, Argos and Lokroi I carapaces⁵⁴. She cut the lower ends of the arms vertically, glued them together and inserted a peg through the joint in order to strengthen it further. Interestingly enough, she observed⁵⁵ that two holes on Lokroi I, symmetrical about a central scale and near the base of the shell are “roughly hewn” and “do not seem to have been carefully drilled like most of the other perforations on the shell”. Roberts interpreted these holes as openings through which passed threads, for tying the (external) wooden tailpiece to the peg of the (internal) arms joint⁵⁶. However, we now know that the lyre tailpieces were made of iron and inserted into the carapace through holes drilled in it, so these “roughly hewn” openings on the Lokroi I shell should be either for the tailpiece to go through, or, possibly, ‘nests’ for the lower ends of the arms (compare Ambrakia II for similar, irregular breaks on the shell at the respective places, Fig. 17)⁵⁷.

Bélis has reconstructed several *chelyes* for her performances with the ensemble Kerylos. As far as I can tell either from the published photographs of one particular reconstruction⁵⁸ or from the reconstructions presented at the theatre of Delphoi in 1992⁵⁹, the lower ends of the arms were not thought of as nesting inside holes on the sides of the shell⁶⁰.

Maas and Snyder dedicate a chapter to the construction of the *chelys* in their book on ancient Hellenic stringed instruments⁶¹. However, as they examine only iconographical and literary evidence, excluding the carapace finds, they are not able to say, with regard to the fixing of the arms to the soundbox, anything more than that “a measured length of reed [was fixed inside the shell] by means of (pins through the) holes pierced in the back of the tortoise shell”⁶².

Dumoulin, in her study of the *chelys* in two consecutive articles⁶³, refers to the proposals made by Phaklarēs, Courbin and Roberts as regards the fastening of the arms to the soundbox, but makes no new contribution to the solution of the problem.

Prohászka, in her study and reconstruction of the Metapontion lyre⁶⁴, used curved lengths of reed to connect the arms between them inside the shell, which she then fixed onto the carapace at

their centres by small bronze pins, as the pairs of small holes and surviving pins in some of them along the ‘dome’ of the shell suggested. The photographs the author provides of the carapace⁶⁵ do not seem to have large, lateral holes similar to the ones found on the Acharnian Gate, Lecce, Poseidōnia, Ambrakia II and possibly Lokroi I shells. We must, therefore, conclude that in this particular lyre the arms did not go through the soundbox; another method of joining the arms to the soundbox was selected, possibly that proposed by Prohászka.

CONCLUSION

In conclusion, it can be said that the above analysis has shown that the Acharnian Gate carapace was, indeed, the soundbox of a genuine classical Hellenic lyre, of the *chelys* (or, possibly, the *barbitos*) type. The large holes on the sides of the shell very likely functioned as ‘nests’ of the lower ends of the arms, a proposition strengthened by the fact that only one more hole (E, at the apex) is to be found on the shell, which, alone, is unlikely to have played a significant role in the way the arms were fixed to the soundbox.

⁵⁴ In addition to the literary and a selection of the iconographical evidence. Roberts 1981, 305.

⁵⁵ Roberts 1981, 310.

⁵⁶ See Roberts 1981, pl. 72–73.

⁵⁷ The Lokroi I carapace, however, has another pair of similar “roughly hewn” holes further up from those referred to by Roberts, which would correspond better to the ‘pockets’ of the Acharnian Gate shell (Fig. 20).

⁵⁸ Bélis 1989a, 137, Fig. 6 or Bélis 1989b, 47.

⁵⁹ Concert de musique grecque antique par l’ensemble Kérylos et les chœurs d’hommes de l’ALAM dirigés par Annie Bélis. Delphes. Théâtre Antique, le 19 septembre 1992, à 17 h. Athènes. Institut français, le 21 septembre 1992, à 20 h. 30 (Concert programme).

⁶⁰ Bélis, as far as I know, does not describe in her related articles (1985; 1989a; 1989b) the way the arms were attached to the carapace in her reconstructions.

⁶¹ Maas/Snyder 1989, 94–99.

⁶² Maas/Snyder 1989, 95.

⁶³ Dumoulin 1992a; Dumoulin 1992b.

⁶⁴ Prohászka 1995, 149–150; 146, Figs. 34–35, reproduced here as Fig. 24.

⁶⁵ Prohászka 1995, pl. 41A–B.

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Fig. 1 The Acharnian Gate (Athens II) carapace; convex side. Photograph by the author.



Fig. 2 The Acharnian Gate (Athens II) carapace; concave side. Photograph by the author.

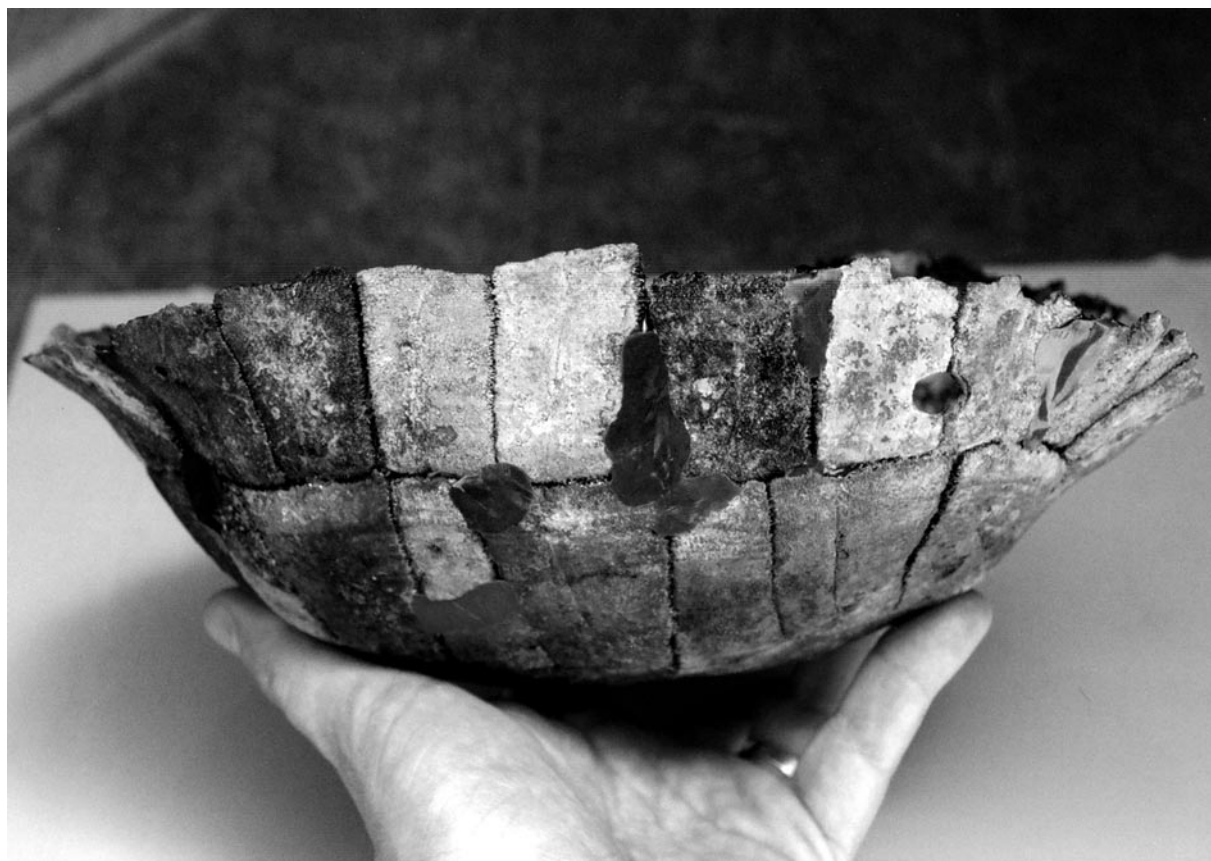


Fig. 3 The Acharnian Gate (Athens II) carapace; side view. Photograph by the author.



Fig. 4 The Acharnian Gate (Athens II) carapace; tail end, convex side. The four holes A, B, C, D along the rim. Photograph by the author.



Fig. 5 The Acharnian Gate (Athens II) carapace; head end, convex side. The holes G, H, I, J, and the iron elements through holes K and L. Photograph by the author.

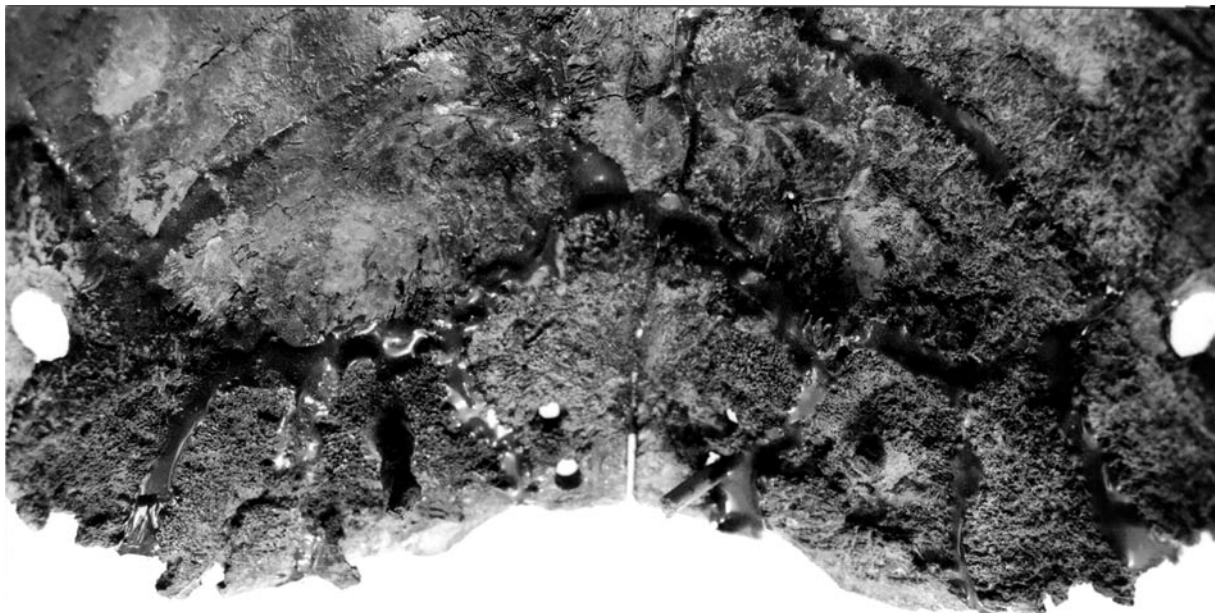


Fig. 6 The Acharnian Gate (Athens II) carapace; head end, concave side. The iron elements through holes K and L. Photograph by the author.

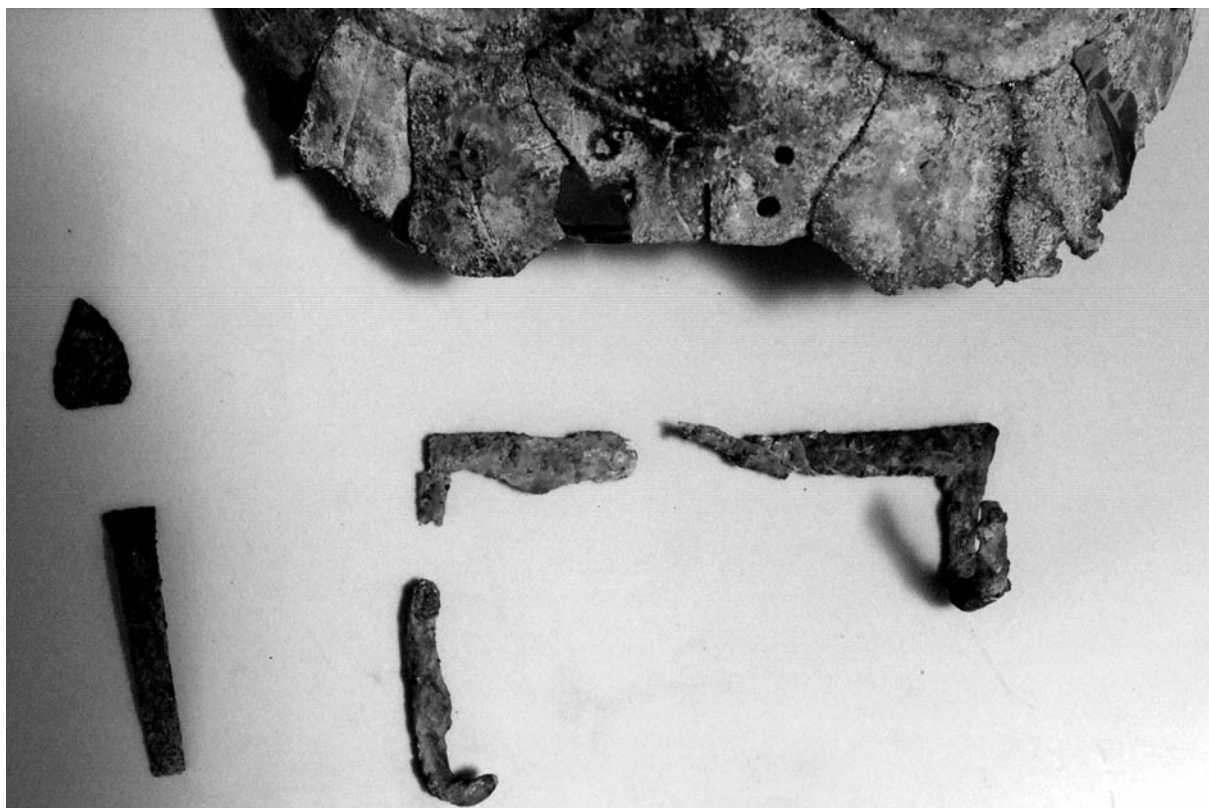


Fig. 7 The Acharnian Gate (Athens II) carapace; the loose iron elements b, c, d of the tailpiece. Photograph by the author.



Fig. 8 The Acharnian Gate (Athens II) carapace; the reconstructed tailpiece. Photograph by the author.



Fig. 9 The Acharnian Gate (Athens II) carapace and tailpiece: distance between holes K and L (iron elements a and e) equal to the length of the tailpiece. Photograph by the author.



Fig. 10 The Acharnian Gate (Athens II) carapace; concave side, side view: the lateral, large hole K. Photograph by the author.



Fig. 11 The Acharnian Gate (Athens II) carapace; convex side, side view: the lateral, large hole K. Photograph by the author.



Fig. 12 The Acharnian Gate (Athens II) carapace; convex side, side view: the lateral, large hole L. Photograph by the author.



Fig. 13 The Acharnian Gate (Athens II) carapace; convex side, side view: the undulating rim above the lateral, large hole K. Photograph by the author.

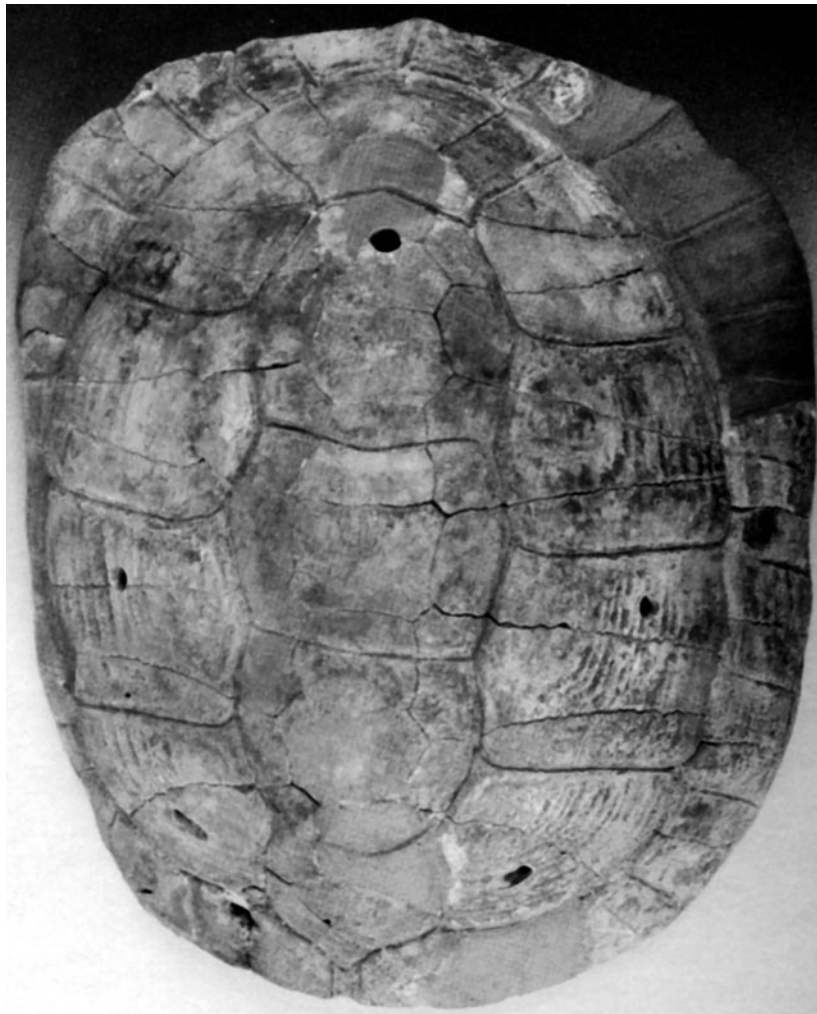


Fig. 14 The Bassai carapace. Photograph adopted from Arapoyianni 2003, 164, item 53.

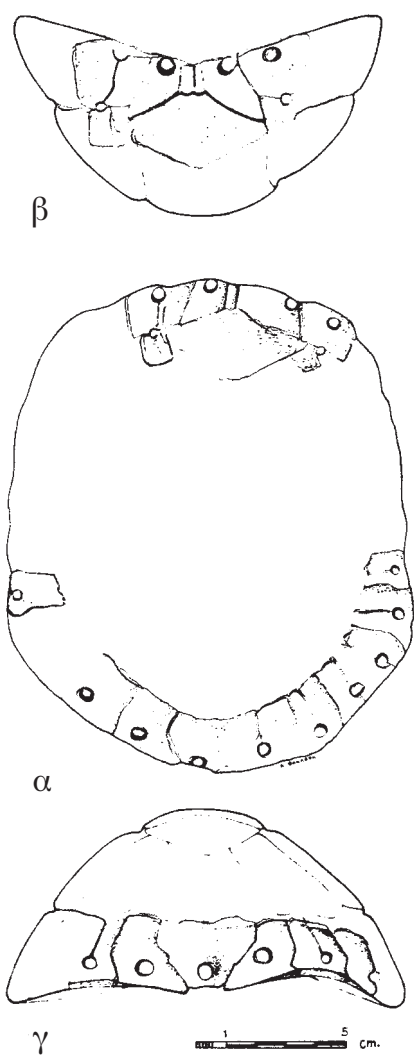


Fig. 15 The Ambrakia I carapace. Sketch adopted from Φάκλαρης 1977, 222 Fig. 4a-c.

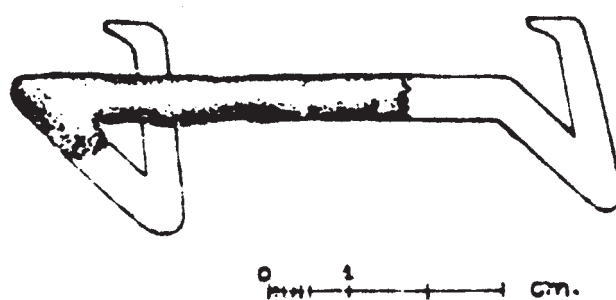


Fig. 16 The tailpiece found with the Ambrakia I carapace. Sketch adopted from Φάκλαρης 1977, 223 Fig. 5.



Fig. 17 The Ambrakia II carapace. Photograph adopted from Zachos 2003, item 54.

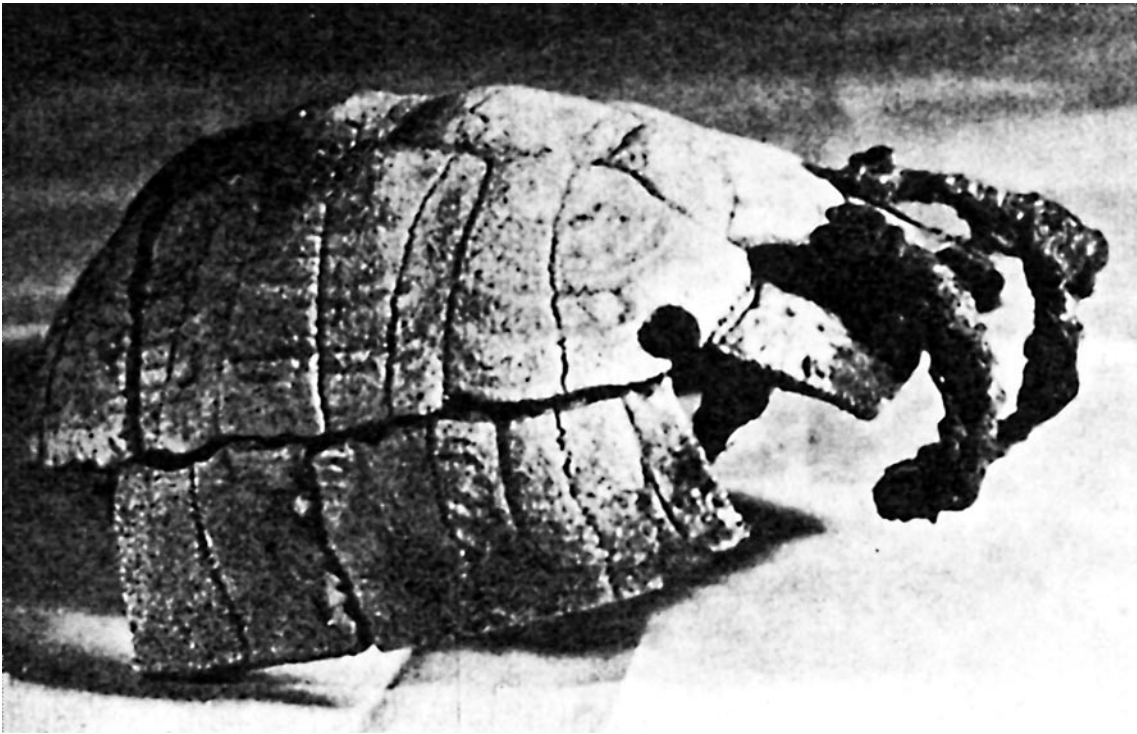


Fig. 18 The Lecce carapace. Photograph adopted from Schirinzi 1961, 15 Fig. 2 (top).



Fig. 19 The Poseidonia carapace. Photograph by Conrad Steinmann.



Fig. 20 The Lokroi Epizephyrioi I carapace. Photograph adopted from Roberts 1981, Pl. 70.

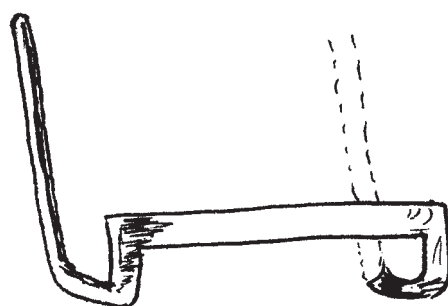


Fig. 21 The tailpiece found with the Lokroi Epizephyrioi I carapace.
Sketch adapted from Orsi 1917, Fig. 71.

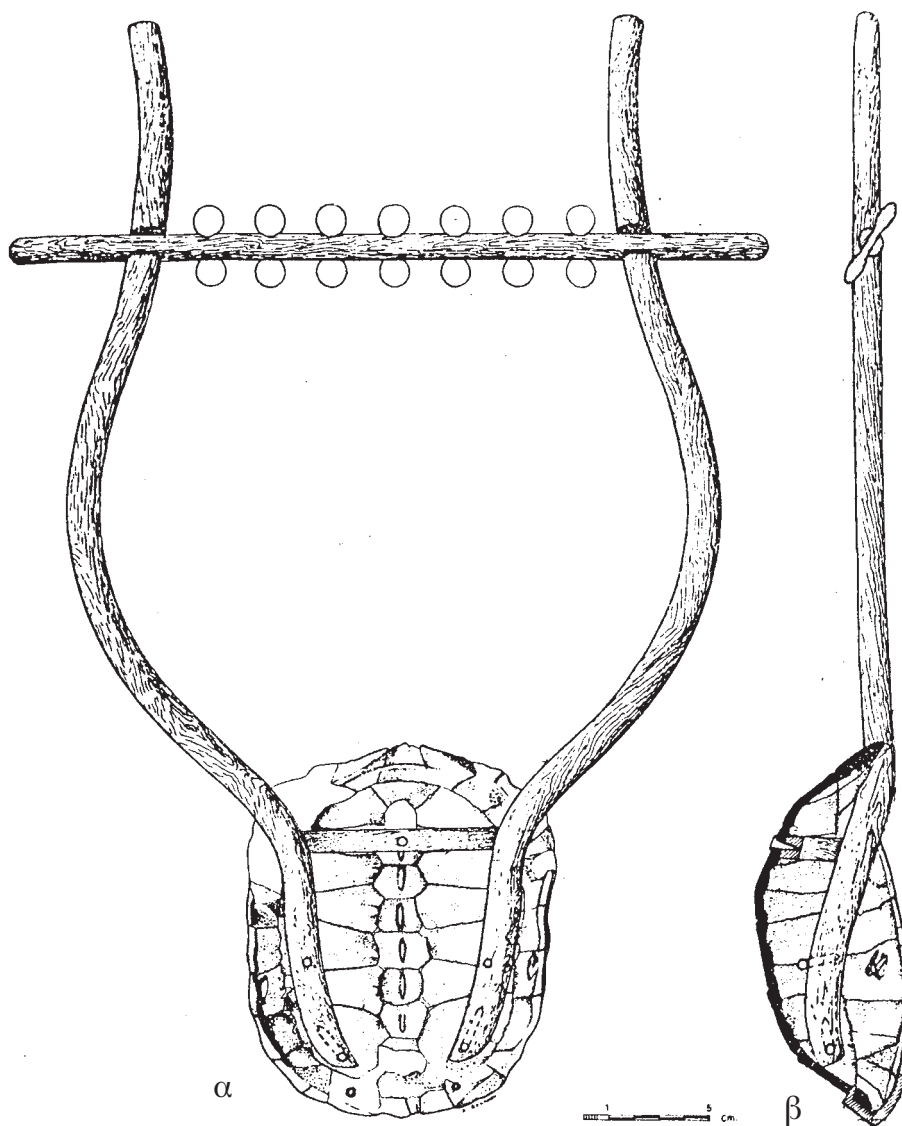


Fig. 22 Reconstruction of the *chelys* by Phaklarēs. Sketch adopted from Φάκλαρης 1977, 227 Fig. 8.

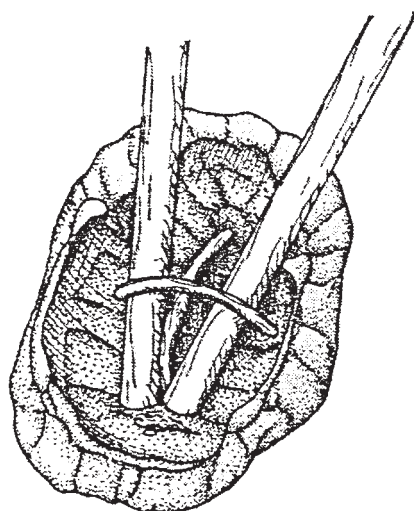


Fig. 23 Reconstruction of the Argos lyre by Courbin. Sketch adopted from Dumoulin 1992b, 233 Fig. 2.

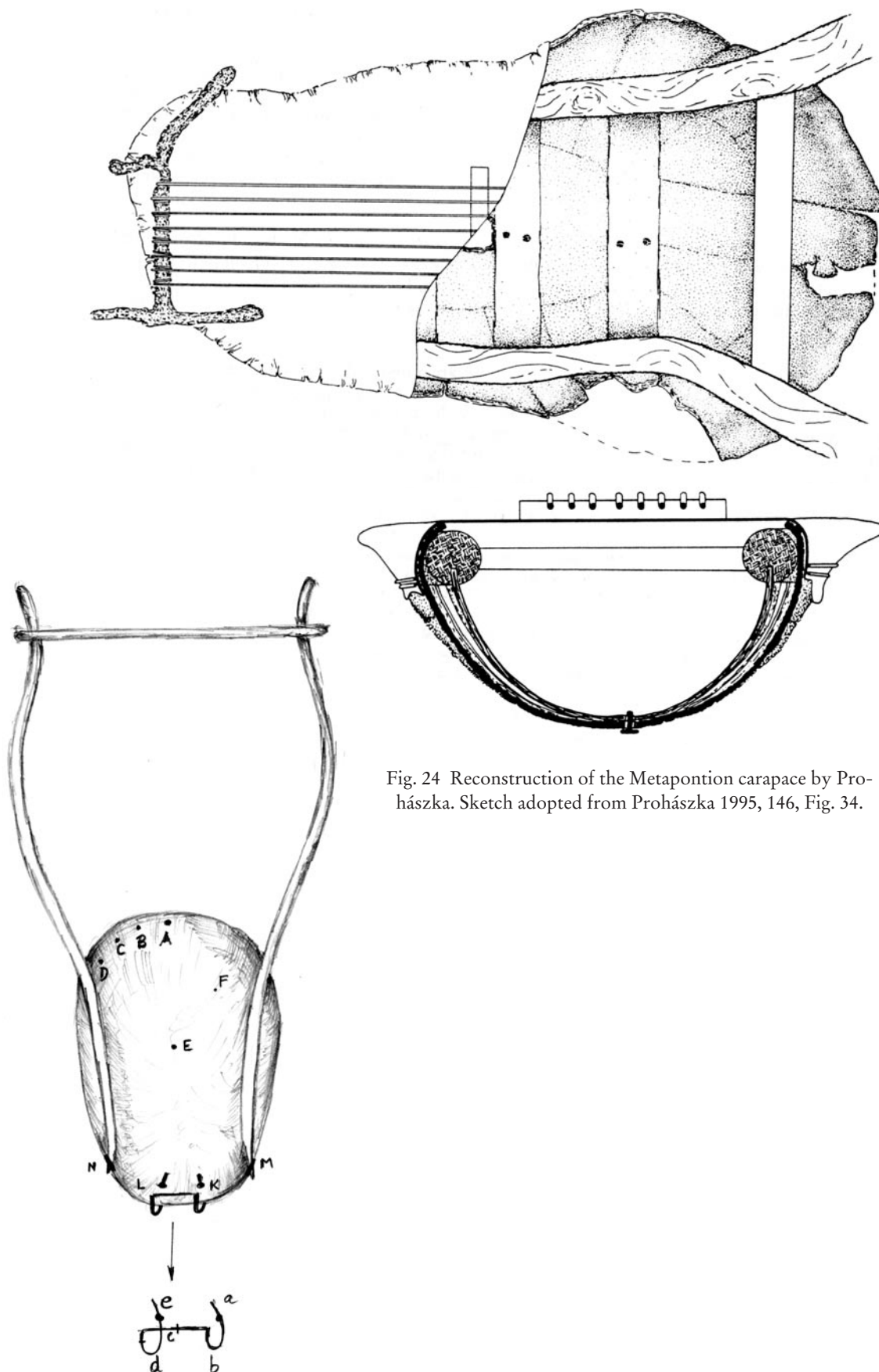


Fig. 24 Reconstruction of the Metapontion carapace by Prohászka. Sketch adopted from Prohászka 1995, 146, Fig. 34.

Fig. 25 Reconstruction of the Acharnian Gate (Athens II) *chelys*. Sketch, not to scale by the author.



Fig. 26 Pharaonic kithara, with the arms going through the base. Ägyptisches Museum zu Berlin, Inv. No 7100, 19th Dynasty, ca. 1200 B.C. Photograph by the author.