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# HOPLITE SHIELDS WITH ATTACHMENTS OF IRON. IDENTIFYING PIECES OF ARMOR OF ALEXANDER THE GREAT'S CAMPAIGN TO ASIA

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**Abstract.** This paper focuses on a distinct group of hoplite shields featuring internal fittings made of iron, in contrast to the, until then, general use of bronze for these fittings. It was only in 2004 that the remains of these shields were singled out and classified as a separate category -some of them being initially interpreted as different kinds of items- and their distinctive features were clearly established (Stamatopoulou 2004, 130-131). The present study compiles all known examples of shields with iron attachments,<sup>1</sup> analyzes their structural elements, and explores their geographical and chronological distribution.

This investigation allows the historical context of their production and their use to be established, suggesting that the hoplite shields with attachments of iron were manufactured in Macedonia during the early years of Alexander the Great's reign and belonged to his peers. They are part of a breakthrough observed in the personal military equipment of the period, in which the use of iron was introduced in defensive armor, replacing the bronze that had previously been used in their manufacture.

These major developments in weaponry can only be associated with a significant production of military equipment that took place in Macedonia during this period, and therefore these shields are tangible evidence of the most significant and decisive military operation in the history of the Macedonian kingdom, Alexander the Great's Campaign against the Persian Empire. Together with the other military equipment of the same date, which was also produced by workshops with state-controlled production of high standards, they reveal the extent and systematic nature of the preparations that enhanced the army's effectiveness on the battlefield and contributed to the outcome of the campaign.

## 1 The hoplite shields

Although the introduction of the hoplite shield to the battle fields dates back to the late 8th century BC, even in the first two thirds of the 7th century BC the shield is known only from its depictions in art rather than actual finds. Ancient sources refer to it simply as a "shield" (*ἀσπίς*) (Archilochus 5.3) or the "Argive shield" (*ἀσπίς ἀργολική*), named after the place where it was first created according to tradition.<sup>2</sup> It was also known as the "hoplon" (*ὄπλον*), a term that,

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<sup>1</sup> We prefer to designate these shields as 'shields with iron attachments' rather than 'iron shields,' as the primary material used in the construction of hoplite shields is wood.

<sup>2</sup> Pindar fr. 106. Paus. 8. 50. 1. Apollodorus, Bibl. 2. 2. 2. Dionysios Halic. 1. 21. Aelian, *Varia Historia* 3. 24. Virgilius, *Aeniad* 3. 637. Pollux Onomasticon 1. 149. The study of the finds of shields confirms

according to Diodorus, came to denote all weapons in general (ὄπλα), as well as the hoplite phalanx, due to the universal use of this shield, the *hoplon*.<sup>3</sup> Its dominance lasted for more than three centuries, with no significant changes in terms of shape or manufacture. It is considered to have originated from the large shields of the Assyrians, which measured up to 0.75m in diameter, with the key addition of the double-handle system, considered to be a Greek innovation.<sup>4</sup>

The overall features of the hoplite shield are well-documented through numerous depictions in art, while actual finds have provided evidence for each of the individual elements of these complex objects, that were primarily made of organic materials, mainly wood, with the metal elements playing an ancillary but indispensable role. The hoplite shield consisted mainly of a concave wooden wall, with a thickness ranging from 7 mm to 2cm, lined with fabric or with a combination of fabric and leather lining, providing protection to the wooden surface and covering the ends of the numerous nails that secured the internal fittings on the shield wall.

In some instances, it also featured a thin outer coating of bronze sheet, referred to in ancient sources as the *χάλκωμα*, an addition that would never become standard, as evidenced by the extant finds. This coating was too thin to provide structural reinforcement to the wooden wall and protection to the hoplite, and instead served to protect the wooden surface while enhancing its visual appeal (Blyth 1977, 189-190, 1982, 18). This optional addition of a bronze lining reached its greatest popularity in the 6th century BC, but at least by the last quarter of the 5th century BC it had largely fallen out of use.

The hoplite shield was convex and elliptical in shape rather than round. Its diameter was dictated by the stature of the bearer, so that it would cover him from shoulder to nearly knee height. The average diameter of the shields that are preserved in this dimension is approximately 87cm. A distinctive feature of the hoplite shield was its flat, protruding rim (*ἄντυξ* or *ἵτις*), measuring between 5 and 9cm in width, which encircled the convex shield wall. The *ἄντυξ* was often, though not invariably, coated with a bronze sheet, regardless of whether the shield's wooden core was also faced with bronze. Within the *ἄντυξ* the wall of the shield curved steeply for about 15cm and then flattened out towards the center, resulting in a bowl-shaped shield of approximately 16cm in depth.

On the inner side of the wooden core the double handle system was mounted, facilitating both carrying and manipulation of the shield. It consisted of the armband (*πόρπαξ*), a large loop for the forearm typically made of hard leather, positioned above and slightly to the right of the shield's center of gravity, allowing the warrior to carry it vertically with greater ease, and the handgrip (*ἀντιλαβή*), made of leather cord or rope tied onto special metal attachments right inside the *ἄντυξ* and held firmly in the grip of the hoplite for the manipulation of the shield. More specifically, the *πόρπαξ* was fixed higher than the center of the shield and towards the hand grip side (*ἀντιλαβή*), due to the fact that the shield being carried in a vertical position, its

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the pre-eminence of Argos in the manufacture of shields. Cf. Kunze 1950, 215-230; Snodgrass 1964a, 63-64; Bol 1985, 49; Stamatopoulou 2004, 33, 477-478.

<sup>3</sup> Simonides 7, 431. Thucydides 7, 75, 5. Aristophanes, *Lysistrata* 558 ff. Xenophon, *Hellenica* 2, 4, 25 and 5, 4, 16-18. Diodorus Sic. 15, 44, 3 and 23, 2, 1; Pausanias 8, 47, 2. A study by Lazenby and Whitehead 1996, 27-33, refutes the validity of Diodorus' information and maintains that the term *hopla* referred to the entire hoplite apparatus using rather debatable arguments that will be discussed elsewhere.

<sup>4</sup> Snodgrass 1964a, pp. 66-67, notes 115-120. It is noteworthy that the same origin is traced for both animals' bust shields and shields with a central umbo which were adopted without any adaptations. See Snodgrass 1964a, pp. 52-55 and Snodgrass 1964b pp. 107-118.

center of gravity lies above the center of its circumference. Placing it not only above but also to the right of the center towards the side where the *ἀντιλαβή* was mounted, allowed for easier handling of the large shield to provide protection from blows. The fixing point of the *πόρπαξ* in relation to the horizontal and vertical diameter of the shields depends on the diameter of the shield and the length of the warrior's arm, and therefore are not uniform. A result of this arrangement is the inequality in the length of the shield bands extending vertically above and below the *πόρπαξ*, and the round bands encircling the near-flat central part of the shield to the left and right of the shield bands. The shield bands above the *porpax* are shorter in length than those below it, and the circular bands to its right are shorter than those on its left. The double-handle system is a significant innovation typical of this type of shield, in addition to which we must consider the shape of the pronounced curvature of its wall, designed to fit the warrior's shoulder in order to allow the shield's weight to rest on the shoulder, thereby occasionally relieving the forearm from its burden (Bol 1989, 93-101).

The inner surface of the shield featured a set of metal fittings, intended both for fixing the two handles and ensuring the firmness of the inner linings, which were in constant rubbing contact with the warrior's left arm and forearm. These included the *πόρπαξ* and its fittings, typically composed of paired sheets either in isosceles trapezoid, elliptical or circular shapes, and the shield bands, as well as the metal attachments for securing the *ἀντιλαβή*, which was made of leather or rope. Additionally, a circular band ensured that the inner linings remained firmly adhering to the wooden core, particularly at the point where the wall of the shield presents the most pronounced curvature. Small attachments with suspended rings were also present, most likely used for fastening straps or decorative tassels. These fittings were made of bronze up to the middle of the 4th century and were decorated *au repoussé*, covered throughout the 6th century with decoration, mainly of mythological imagery.

## **2 The hoplite shields with attachments of iron**

Prior to the excavation of the renowned Tomb 77 in the necropolis of Salamis, Cyprus, conducted by the Department of Antiquities of Cyprus in 1965–1966, and particularly prior to its publication in 1973/74, the existence of shields with all their fittings made of iron was unknown. The first such discovery in mainland Greece occurred in the unlooted Tomb II of the Great Tumulus at Vergina. There, alongside the gold-and-ivory shield with internal fittings of gilded silver, a second hoplite shield with iron fittings was also deposited. Proper identification of these iron sheets was facilitated by their intact condition and their similarity to those of the chryselephantine shield. Additionally, fragments of iron sheets belonging to yet another shield were retrieved from among the remains of the funeral pyre of the tomb's principal occupant deposited on the outer surface of the tomb's barrel vault.

The currently known corpus of shields of this category comprises eleven examples from Macedonia, one from Thrace, and more than ten from Salamis in Cyprus.

### **2.1 The shield with iron fittings from the chamber of Tomb II in the Great Tumulus at Vergina**

This shield is the most complete surviving example of the examined category (fig. 1). It was deposited near the southwest corner of the burial chamber, adjacent to the gold-and-ivory shield (Andronikos 1984, 119 and 137; Faklaris 1994, 108, Stamatopoulou 2004, 252-257). The whole set of its metal fittings is preserved, though in a state of advanced corrosion. Their rear surfaces retain in mineralized condition all layers and sorts of organic materials that

originally comprised the shield, preserved only in their parts that were overlaid by the iron sheets (fig. 2).



Fig. 1. Vergina. The shield with iron attachments from Tomb II of the Great Tumulus. (photo P. Faklaris).

Valuable evidence for the construction of the hoplite shields can be obtained from the stratified layers of overlapping organic materials of this shield. The successive layers of materials occur in the following sequence, starting from the inner to the outer surface of the shield: iron sheets, leather, sparsely woven fabric (*ἀσπάθητον*), wood, sparsely woven fabric and densely woven fabric (*σπαθητόν*). This suggests that the wooden core was first covered internally and externally with a layer of sparsely woven fabric, which was probably applied to the surfaces of the bowl with adhesive. The outer surface was then coated with a very densely woven fabric, while the inner surface was lined with leather, onto which the metal fittings were nailed. Notably, the two types of fabric were arranged so that their fibers were oriented in different directions and do not coincide, ensuring a denser and firmer covering of the wooden surface (fig. 2). The length of the shanks of the nails used to secure the iron fittings to the shield indicates that the wooden core varied in thickness between 8 and 4 mm, increasing towards its center and perimeter.



Fig. 2. Vergina. The shield with iron attachments from Tomb II of the Great Tumulus. Detail of the rear surface (photo P. Faklaris).

This shield was equipped with a fixed armband (*πόρπαξ*), secured by a pair of trapezoidal iron plates, decorated with depictions of lions *au repoussé*. The shield bands, which have survived in their full length, measure 28.6cm above and 35cm below the *πόρπαξ*, due to the characteristically off-centered placement of the armband and its attachments on the shield (Stamatopoulou 2004, 250). These bands range in width from 5.5 and 5.7cm to 5cm, tapering towards their palmette-shaped terminals. The circular bands, measuring 2.2cm in width, are partially preserved.

Each iron sheet features a pair of embossed ribbed strips along their edges, between which bronze nails were fixed at 2-3cm intervals for securing the sheets to the shield. The inner surface of the shield was also equipped with eight shield-shaped bosses, each measuring 3.2cm in diameter, with suspended rings of 1.3cm in diameter, as well as six additional bosses in the shape of ivy leaves, two of which with iron rings.

## 2.2 The shield from the funerary pyre of Tomb II of the Great Tumulus in Vergina

Among the remains of the funeral pyre of the individual interred in the chamber of Tomb II in the Great Tumulus of Vergina, found deposited over the external surface of its barrel vault (Andronikos 1984, 226, Faklaris 1994, 108), fragments of the metal fittings of an iron hoplite shield were recovered. This shield had been offered to the pyre, therefore its fittings to not preserve organic materials on their back surfaces, however, the intense temperature to which they were exposed during cremation protected the iron plates from corrosion.

The recovered fragments include components of the hinge for mounting the removable armband (*πόρπαξ*) that was mainly made of leather, as well as sections of its pair of trapezoidal iron plates, measuring 11.7cm in preserved width, bearing depictions of pairs of lions with a star occupying the field between them, all executed *au repoussé* (fig. 3).

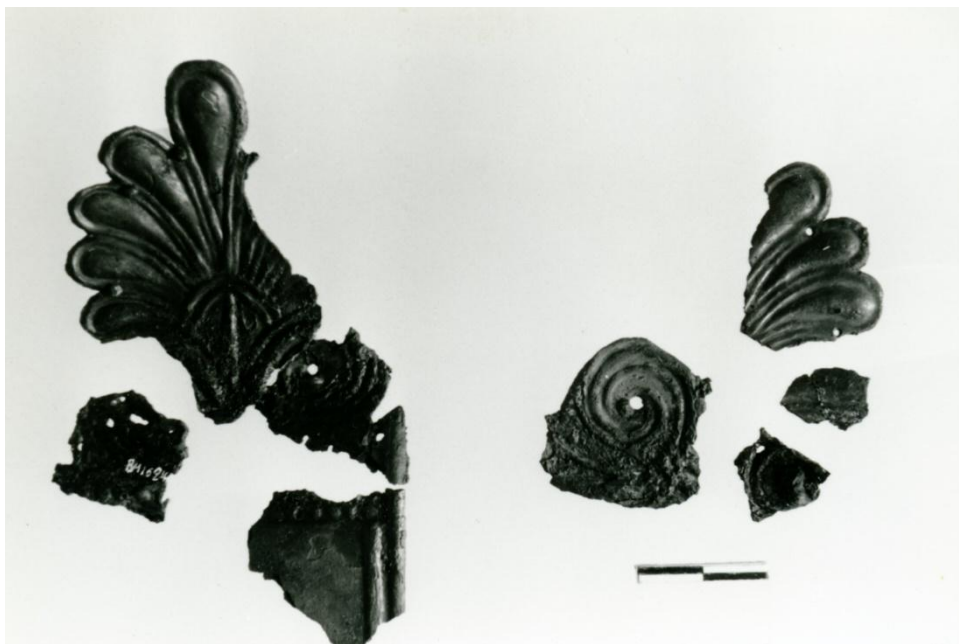


Fig. 3. Vergina. Fragments of iron attachments from the iron shield of the funerary pyre of Tomb II of the Great Tumulus (photo by P. Faklaris).

Fragments of the palmette-shaped terminals of the shield bands were also found (5.6cm in height and 5cm in preserved width), as well as sections of their side edges with pairs of embossed strips. Five fragments of the circular bands were also recovered, totaling 26cm in length. Two pi-shaped fittings for tying the handgrip (*ἀντιλαβή*), were also identified, along with two iron ivy-leaf attachments (measuring 3.1x3cm), closely resembling those of the shield AII from Tomb A at Derveni and additionally fragments of three shield-shaped bosses (Stamatopoulou 2004, 276-277).

Although only small fragments of the metal fittings of this shield were recovered, these components are representative of the complete set of fittings and provide sufficient evidence for the reconstruction of the entire shield.

### 2.3 The shield from the acropolis of Vergina

A few fragments of iron sheets found during excavations within the fortified acropolis of Vergina represent the only known example of a shield with iron fittings which, at first consideration, is a non-burial find. These fragments were recovered from a layer of the second half of the 2nd century BC (Faklaris, Stamatopoulou 1997, 122).

The recovered pieces include: a) a fragment of a circular band measuring 2.35–2.2cm in width and 3.3cm in length, b) part of the inner end of a shield band, measuring 3.2cm in length and 3.3cm in width, and, c) a fragment of the armband fitting, measuring 5cm in length and 5.9cm in width, which preserves its outer edge marked by a pair of embossed strips (fig. 4). Although deformed, this fragment appears to have belonged to a circular fitting that reinforced the mounting of the armband (Stamatopoulou 2004, 278-280).





Fig. 4. Vergina. Fragments of iron attachments from the iron shield of the acropolis (photo by author).

#### **2.4 The shield from Louloudia in Kitros, Pieria**

Tomb D was found plundered in 1982 in the area of Louloudia in Kitros, Pieria. Among the few finds, a total of 71 fragments of iron plates of a shield were recovered in a fragmented state. The individual fragments range in size from  $3.5 \times 3\text{cm}$  to  $0.9 \times 0.5\text{cm}$ . The iron plates have a thickness of  $0.1\text{cm}$ , while the preserved organic material on their backs increases their total thickness to  $0.5\text{cm}$  (Stamatopoulou 2004, 121-123).

Only two fragments preserve their full width belonging to the circular bands of the shield,  $0.25\text{m}$  long and  $0.23$  and  $0.22\text{m}$  long (fig. 5). One of these retains a bronze pin near its edge.



Fig. 5. Kitros, Pieria. Fragments of iron attachments from a hoplite shield (photo by author).

Twenty-six additional fragments retain their original edges decorated with an embossed pair of ribbed strips 0.8cm wide, amongst which survive some of the bronze nails, 0.2cm thick, used to secure the iron sheet to the wooden shield core. A fragment measuring 0.35x0.31cm comes from the plates mounting the armband, as evidenced by the bronze nail attached to it with a head diameter of 0.6cm. The other fragments, although undoubtedly belonging to internal fittings, due to their fragmentation, are not identifiable as parts of specific attachments.

The wood remnants preserved on the rear surfaces of the iron sheets were examined by Professors Ilias Voulgaridis and K. Pasialis of the Department of Forestry at Aristotle University of Thessaloniki, and it was established that it came from a broadleaf species, although its condition did not allow a more precise identification.

The tomb was discovered extensively plundered and severely damaged. Based on its stratigraphic context and its association with neighboring datable tombs, the experienced excavator, M. Besios, determined the dating of Tomb D to after the mid-4th century BC (Besios 1987, 210-211).

## **2.5 and 2.6 The shields from tomb A of Derveni**

In the renowned Cist Grave A of Derveni, which came to light by chance during road construction works in 1962, among the numerous weapons deposited as offerings to the *hetairos* interred there, two hoplite shields with iron attachments were found. The initial publication of the find attributed these fittings to a single shield (Themelis, Touratsoglou, 1997, 30 and 46). However, the observation that some fragments preserved on their rear surfaces remains of the organic materials of the shield, while others having been exposed to fire were devoid of organic residues, and additionally, variations in the dimensions of fittings that retained intact one of their original dimensions, such as the circular bands found in fragments 2.5 and 2cm wide, and also the different material of the nails attaching the iron sheets to the wooden core, which were iron for the burnt shield and bronze for the other one, confirmed that the deceased of tomb A had been offered two shields: one placed within the burial chamber and another in the funerary pyre (Stamatopoulou 2004, 130-131).

The shield from the funerary pyre featured details of luxury, typical of this period for the Macedonian elite (Stamatopoulou 2004, 133-159). Specifically, it had internal fittings of iron, hinge and pins of bronze on the armband, silver bosses with suspended silver rings, and shield device (*episemon*) of gilded stucco and ivory. The iron fittings of the funerary pyre shield were found in very small fragments, having a high percentage of missing material.

From the armband mounting system, the lower trapezoidal sheet, with an *au repoussé* depiction of paired lions and a small portion of the corresponding upper sheet were preserved. Only fragments of the shield bands with their palmette –shaped endings survive, as do fragments of the circular bands (figs. 6-7). From the handgrip fittings survived only one iron ivy-leaf shaped attachment and part of the second one. The shield bosses and their rings, all made of silver, intended for securing the inner leather straps and the tassels, were almost entirely preserved.



Fig. 6. Derveni. Fragments of iron circular plates from the shield AI of Tomb A (photo by author).



Fig. 7. Derveni. Fragments of iron palmette-shaped endings of the shield bands from the Shield AI of Tomb A (photo by author).

Additionally, thirty-five fragments of gilded stucco survive from the shield device (*episemon*); their irregular shapes indicate that they were not part of a repetitive floral or geometric motif, nor can they be attributed to representations of garment folds. Among these, two fragments have the form of snake ending hair locks referring to the most frequent subject found on shield devices, the Gorgon head, which in this case is likely to have included the two ivory eyes recovered from the same funerary pyre.

The second shield from Grave A, found within the burial chamber, preserves a significantly larger proportion of its original fittings (Stamatopoulou 2004, 160-208).

The armband set of fittings is represented by parts of the trapezoidal sheets, as well as the bronze hinges and parts of the iron pins mounting the leather part of the armband which was removable. Large parts of the shield bands were preserved together with their palmette-shaped endings (fig. 8) along with approximately three-quarters of the circular bands in numerous fragments. Also preserved were the pi-shaped attachments of the handgrip system

and the ivy-leaf fittings that were attached to their endings. Shield bosses and their rings also survived (fig. 9).



Fig. 8. Derveni. Iron shield band fragment from the shield All of Tomb A (photo by author).



Fig. 9. Derveni. Iron fragments of circular plates from the Shield All of Tomb A (photo by author).



A particularly noteworthy aspect of this shield is the survival of parts of its wooden body - an exceptional occurrence for the climatic and ground conditions of the region – providing valuable insights into the construction techniques employed. A fragment of its shield device, carved in wood, has also been preserved, featuring wavy grooves, probably representing the flowing endings of the hair locks of a Gorgon's head or the pleats of a garment.

## **2.7 The shield from tomb B of Derveni**

The condition of the shield fragments from Tomb B indicates its violent crushing and scattering of fragments, likely resulting from the disturbance caused during the tomb's discovery, which occurred during road construction works. Most of the metal fittings of this shield have been lost and the surviving elements are in rather poor condition, so that the most significant component preserved from this shield is the parts of its wooden structure the study of which, however, falls outside the scope of the present paper (fig.10).



Fig. 10. Derveni. Fragments of iron shield bands from the shield of Tomb B (photo by author).

Among the surviving metal fittings, only a small fragment from the base of the armband remains, along with two fragments of the shield bands and several small sections of the circular band. Additionally, the bronze fittings of the handgrip have been preserved, as well as a fragment of the leather handgrip itself. Some of the bosses with their rings are also preserved (Stamatopoulou 2004, 209-251).

## **2.8 The shield from “Kinch’s tomb” on Lefkadia, Naoussa**

The Macedonian tomb initially investigated in 1889 by the Danish archaeologist K.F. Kinch was found almost entirely plundered (Kinch 1920, 283-288). Excavations were completed much later, in 1970 and 1971, when restoration work of the monument was undertaken. During these works layers of dirt that remained on the chamber floor were removed, revealing, among other finds, fragments of iron shield fittings. Originally these were interpreted by the excavators as metal elements of the wooden chamber door (Romiopoulou, Touratsoglou 1971, 146, 150, 153, 163). However, several key features indicate that they actually belonged to a hoplite shield (fig. 11): the presence of embossed pair of ribbed strips along their edges, flanking a row of small bronze nails, as well as the remains of both wood and leather on their

rear surfaces, and moreover, the edges of the fragments ending in a characteristic backward folding, further support their identification as shield fittings (Stamatopoulou, 2004, 242-245).

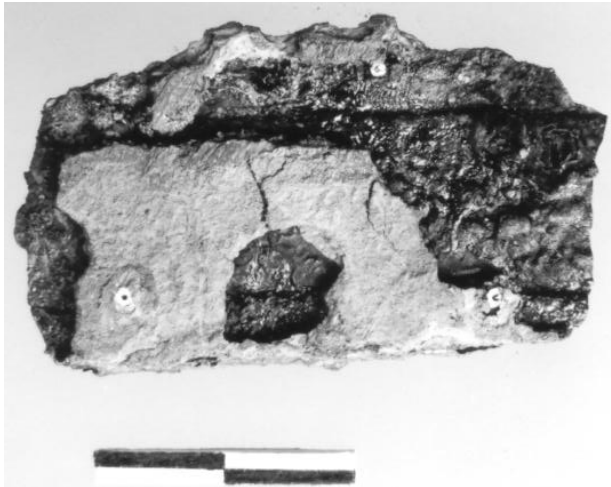


Fig. 11. Lefkadia. Fragment of iron circular plate from the shield of the "Kinch's Tomb" (photo by author).

The surviving elements consist of only a small fragment of an inner circular band, measuring 4.6cm in length and 2.4cm in width, and an armband attachment plate, composed of two joined fragments, 14.1cm wide, 9.5cm high and 0.2cm thick.

The tomb has been dated to the mid-3rd century BC, based primarily on two criteria: the now-abandoned theory regarding the chronological significance of the vertical radius of the arch in Macedonian tombs (Dimakopoulos 2000, pp. 125–159) and the painted scene decorating the chamber. This painting depicts a Macedonian warrior charging on horseback with a sarissa against a foot soldier in oriental attire, depicted in a defensive stance, and bears stylistic similarities to the Neapolis mosaic (Romipoulou, Touratsoglou 1971, 164). This dating appears to be somewhat inconsistent with that of the shield itself, which can safely be attributed to the period between the last third of the 4th century and the early 3rd century BC, based on its technical characteristics.

## 2.9 The shield from the "Cist-grave B of Katerini"

This shield was found in within the "Cist-grave B of Katerini" that was discovered plundered in 1976, located just 9m east of "Cist-tomb A of Katerini", and was excavated in 1980.

The shield fragments were recovered from the central and northern parts of the tomb. Numerous fragments were collected, though many do not retain their original edges. Among the surviving parts are a fragment of a shield band, part of a trapezoidal plate, and a small fragment of an iron hinge, which may come from the removable armband if it indeed belongs to the shield. The shield band measures between 5.5 and 5cm in width, while the trapezoidal sheet bears the standard *au repoussé* decoration of a pair of lions. Parts of the circular band, measuring 2cm in width, as well as bosses with rings were also preserved. The rear surfaces of many of the fragments preserve mineralized remains of the organic materials of the shield, including fabric, most likely linen, and wood (Fig. 12).



Fig. 12. Katerini. Iron shield band fragments of the shield from Tomb B (photo from Schmidt-Dounas 2017, Farbtaf. 29).

The tomb has been dated to the last quarter of the 4th century BC (Schmidt-Dounas 2017, 163-171, 178-179. For the fabric remains see Kechagias 2017, 171-172. Despoini 1980, 370).

## 2.10 The shield from the macedonian tomb of Agios Athanasios, Thessaloniki

Scattered fragments of iron fittings from a hoplite shield were found on the floor of the chamber of the Macedonian tomb excavated in 1994 at Aghios Athanasios, Thessaloniki. The shield was part of a remarkable assemblage of weaponry, found in fragmentary condition, deposited as offerings for the warrior interred in that tomb. These included an iron breastplate, an iron helmet, a pair of iron shinguards, a gorget and two spearheads.

According to the excavator the tomb dates to the last quarter of the 4th century BC.<sup>5</sup> At the time of the publication, the remains of the shield were still undergoing conservation and the information provided states that a 'sufficient number of fragmentary wrought iron plates were identified which...appear to belong to the outer *antyx* and central *umbo* of a large hoplite shield' (Tsimpidou-Avloniti 2005, 106 and 2011, 362-363). However, it is highly unlikely that these remains represent the metal lining of the *antyx*, as the practice of coating the *antyx* with metal

<sup>5</sup> On the tomb, with a focus on the painted decoration of its façade, see Tsimpidou-Avloniti 2005, 89 ff. The list of finds, on pp. 159-165, does not include the weapons, for which see mention on p. 106. For the dating of the tomb see p. 108. For the other than the shield weaponry, see note 108. Tsimpidou-Avloniti 2011, 351-363.

plates is abandoned by this period, and does not appear in any of the hoplite shields with iron fittings known to date; also in previous centuries when such finds did occur they were exclusively of bronze. No evidence exists to support the use of iron for this purpose in the 4<sup>th</sup> century.

Given the frequent misidentification of circular bands as *antyx* linings (e.g. Karageorgis 1973, 194), it is reasonable to assume that these fragments are more likely to represent components of the internal circular band. Similarly, the element identified as a central umbo would, in all probability, correspond to the attachment plate of the armband. In any case, the find is awaiting publication.

### **2.11 The shield from the macedonian “Tomb of Judgment” or “The Great Tomb” at Lefkadia Naoussa**

The monumental Macedonian “Tomb of Judgment” at Lefkadia was the first Macedonian tomb to receive a detailed study and publication by its excavator F. Petsas in 1966, after being excavated between 1954 and 1959 (Petsas 1966). Research in its interior however, had not been completed, due to the structurally unsound condition of the wall of its exceptionally high façade, which measures 8.60m in height. The instability of the façade did not allow the removal of the fills that had flowed into the interior of the antechamber and were supporting it, unless the excavation was combined with restoration works. In 1998, a project for the structural restoration and conservation of the tomb was undertaken (Zampas 1998, 421-433), enabling the completion of excavations in the antechamber.

Among other finds recovered during these works were remains of weapons and fittings associated with one or more shields. Specifically, in the northwestern corner of the antechamber floor, beneath a tholite stone that had fallen from the barrel-vaulted roof, a collection of iron weapons was discovered, which are thought to have been originally deposited against the eastern wall. Among a set of lances, reference is made of “a handle and bronze plates of a shield”, as well as “gamma and pi-shaped iron fasteners”. It is also reported that “large pieces of iron plates in a poor preservation condition were found immediately north of the entrance to the antechamber and are likely to belong to a shield”. Furthermore, near the entrance to the chamber and scattered in the surrounding area, parts of an iron shield were reported. These fragments preserve traces of gold in certain areas, while the reverse surfaces retain remnants of leather.

Five small bronze nails with semispherical heads, found in the northeastern corner of the southern section of the antechamber, next to its entrance, were also thought to be associated with the decoration of the shield (Stefani 1998, 418-419). As only the preliminary excavation report of these finds has been published to date, and the full publication is in preparation (Stefani, 1998, 413 footnote 1), the available information, not supported by photographic documentation, allows only a preliminary acknowledgement of the presence of a shield with iron fittings in this prominent warrior's tomb. The tomb itself was dated by its excavator to about 275 BC (Petsas 1966, 181).

### **2.12 The shield from a funerary pyre in the Thracian city Kavyli**

A major road-construction project conducted in 2009 through the area of the ancient Thracian city of Kavyli in the region of Iambolis in Bulgaria, led to the rescue excavation of a burial mound covering the remains of the funerary pyre of a male individual.

Among the finds weapons were particularly prominent, including a sword, several lances, spear butts, and a horse bridle. In this context fragments of iron sheets from a hoplite shield



were also recovered. The detailed excavation report in which much of the evidence of this well-documented excavation was published, these fragments were not recognized as coming from a shield and it was suggested that they were parts of a wooden chest covering. However, the iron sheet fragments illustrated on fig. 56 of this report leave no doubt that these are in fact parts of a shield of the discussed type. Specifically, a fragment of a circular band preserving its full width, a fragment of a trapezoidal sheet preserving its acute angle, as well as other fragments that do not preserve any of their original edges can be identified (Fig. 13). All intact edges are marked by a pair of ribbed strips, with the groove between them accommodating bronze nails used to attach the iron sheets to the wooden structure of the shield.



Fig. 13. Kavyli, Iambolis. Fragments of iron attachments from a hoplite shield (photo from Stoyanov et al. 2013, fig. 56).

The pyre dates to the final three or two decades of the 4th century BC and can be attributed to a high-ranking member of the Macedonian garrison of Kavyli (Stoyanov et al. 2013, 297, fig. 56).

### **2.13 The shields from Tumulus 77 at the Necropolis of Salamis, Cyprus**

The renowned tumulus 77 located at the southwestern end of the Necropolis of Salamis, was found to cover a square-built platform upon which a massive funeral pyre had been conducted. The tumulus did not cover a grave, nor were any human remains recovered, leading thus to its interpretation as a cenotaph.

The finds among the pyre remains have been dated to the end of the 4th century BC. However, it was interpreted by the excavator as a burial mound erected at the site where funeral honors were paid to Nikocreon, the last king of Salamis, and about fifteen members of his family, who were forced to commit suicide in 311 BC, and accordingly, the tumulus was dated to 311 BC (Karageorgis 1973, pp. 201-202). While this interpretation raises reservations

in light of later discoveries, the general dating of the assemblage to the end of the 4th century BC remains largely accepted.

Among the pyre remains and the other objects that had been offered in honor of the deceased, numerous iron shield attachments were found, and it is important to note that the published fragments represent only a selection from a large number of such fragments recovered from this pyre (Karageorgis 1973, 194). An estimation of their exact number was not possible for the excavators, since they were all found together and in numerous fragments, as is usually the case with the metal sheet finds in burial pyres. However, it is clear that at least ten shields were represented, as evidenced by the discovery of nine rectangular or circular fittings intended for the attachment of armbands, along with additional fragmentary parts of armbands.

No organic material from the shields was preserved, as it was consumed by the pyre. The find includes all types iron fittings of hoplite shields: armband attachment fittings, both rectangular and circular,<sup>6</sup> all hinged, shield bands with palmette endings and circular bands, shield bosses with hanging rings, and handgrip fittings (Karageorgis 1973, 193-194, Pl. CLXXXVIII and CCXCVI/ 139-188, 193, Pl. CLXXXI, CCXC). The fragments of circular bands were misinterpreted as *antyx* coatings, despite their estimated diameter of 60 to 65cm, while the diameter of the shields, as inferred from the shield bands found alongside was estimated at approximately 1m.<sup>7</sup> Furthermore, the morphological characteristics of these fragments align with those of circular bands.

### 3 Discussion

Based on the compilation and presentation of all known finds of shields with iron attachments, this section provides a comprehensive examination of these artifacts, to determine key patterns in terms of manufacture, decoration, dating, and geographical distribution. Furthermore, by integrating these observations with information from other findings of the same era, as well as written sources, this discussion seeks to offer a deeper understanding of the creation and use of this type of shield, placing them within their historical context and exploring their broader significance.

All the iron fittings described above come from the inner surface of the shields. The outer surfaces of the shields in this category do not feature any metal attachments of shield devices or other decoration. The only shields on which evidence of a shield device have been preserved is Shield AI from the pyre of the Cist tomb A at Derveni and its material was gilded stucco and Shield AII from the same tomb which is of wood. In contrast, on the shield from

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<sup>6</sup> For the circular ones, see Karageorgis 1973, 165 ff. pl. CLXXXIX, CXC, CXCI, CCXCVII). These are: 1) no 400+484, 2) no 538, 3) no 590, 4) 709, 5) no 900, 6) no 910. For the rectangular ones see Karageorgis 1973, 165 ff. Pl. CXCVII, CCXCVIII. These are: 1) no 354+429, with part of its pin, 2) no 834, 3) op. 933. The armband attachment fittings were fixed to the shield wall by iron nail with semispherical heads, as e.g. on the pieces inv. nos 538 and 709 (Karageorgis 1973, 193, 200). Moreover, the periphery of all sheets preserves holes with traces of bronze. Apparently bronze nails were used to fix them on the shield. The hinges were fashioned from small rectangular pieces of sheet the axis of which was inserted into pre-cut slots in the surface of the armband attachment fitting and the fixing of their ends to its rear surface (Karageorgis 1973, Pl. CCXCVII).

<sup>7</sup> See Karageorgis 1973, 194 and footnote 5, where reservations are expressed about the accuracy of the calculation of the diameter of circular bands on the basis of their surviving fragments. However, since the diameter of the shields approximated 1m based on the shield bands, a deviation of 35-40cm is unlikely.

the chamber of Tomb II of the Great Tumulus in Vergina-the only shield to come from an unplundered and undisturbed tomb- no evidence was found to suggest that it bore a device of other material on its outer surface. The hoplite shields of this period, as depicted in Macedonian funerary art, are often shown bearing shield devices<sup>8</sup> and it is likely that many of the actual shields also featured devices that were painted on their outer surface, leaving no physical remains.

The outlines of all the plates are marked with a pair of ribbed strips, between which numerous nails are driven to secure the plate to the wooden surface. Notably, the shield from the chamber of Tomb II of Vergina, which is the most complete example to have survived, features one hundred and forty nails used to fix the circular band alone.

These nails were driven from the inner to the outer surface of the shield, and the process concluded by bending the protruding ends of the nail stems on the outer side of the wall, ensuring they made contact with the outer surface of the shield without sticking out. The bent stems provide precise evidence of the thickness of the now degraded wooden shield wall, which corresponds to the length of the unbent portion of the nail stem. This evidence reveals that the thickness of the wooden core was not uniform across the entire surface of the shield, but varies, typically from 1.3 to 0.6cm, with more thickness used to reinforce areas requiring additional strength, while avoiding burdening the whole structure with excess material.

These small nails used for fixing the iron sheets to the wooden shield wall are made either of iron or bronze, but within each shield, nails of the same material are consistently employed along the perimeter of the sheets. Bronze nails have been used on the shield of the chamber of Tomb II of the Vergina Great Tumulus, shield AII of Derveni, the shield from Kinch's tomb, as well as those from Kitros and Kavyli, while iron nails are used on the shields from the pyre of the Tomb of Vergina, the acropolis of Vergina, and shield AI of Derveni. For reference, the dimensions of these small nails are as follows: the head has a diameter of 0.2cm, the stem is 0.15cm thick, and their length varies in accordance with the variance of the thickness of the wooden wall.

The pair of ribbed strips that mark the edges of the attachments serves multiple functions: they reinforce the sheets against wrinkling or tearing, protect the warrior's skin from their otherwise sharp edges, and accommodate the nails between them, ensuring that the heads will not injure the skin of the bearer.

The attachments that form the bases of the actual armbands, which were made of thick leather, are either rectangular or circular in shape, with their fixing sheets being trapezoidal. These are commonly decorated in the *au repoussé* technique, featuring a pair of male lions, in a heraldic arrangement, or are left undecorated, except for the ribbed strip framing, which is invariably present.

The armband base is justifiably the attachment most securely fixed to the shield, as it bears most of the shield's weight. On the shields of this type, the leather part of the armband was typically hinged, and less frequently permanently fixed.<sup>9</sup> All published armband attachments in the Cypriot shield assemblage from Salamis are hinged. For securing the sheet bases of

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<sup>8</sup> See e.g. Tsimbidou-Avloniti 2005, Pl. 24-25, 27a, b, 40-41.

<sup>9</sup> The use of armbands with their leather parts removable by means of hinges secured with pins, according to the sources is a precautionary measure to prevent unauthorized use of the shields (e.g. Aristophanes, *Knights* 849 and 858). Further interpretations have been suggested in literature, such as the need to fit the warrior's hand precisely, to be easily replaced when worn or to allow the shields to be stacked directly on top of each other during transportation or storage. See Stamatopoulou 2004, 394-395.

the armbands, as well as the trapezoidal sheets and the palmette endings of the shield bands, nails of significantly larger dimensions than those used to secure the perimeter of the attachments were employed. These nails typically have stems of 0.2-0.3cm in thickness, and slightly domed heads with a diameter of 0.4-0.5cm. Their length varied according to the thickness of the shield's wooden wall. Pairs of lions are the motif that appears in the vast majority of decorated trapezoidal attachments. This theme symbolizes power and is appropriate for weapon decoration; however, it seems that the main reason for its prevalence is its ideal adaptation to the awkwardly shaped field of trapezoidal attachments (Bol 1989, 30-31. Stamatopoulou 2004, 141-142, 403-404, 492-493).

The shield bands, which until the mid-5th century BC were the most heavily decorated elements on shields with bronze fittings, featuring a multitude of mythological scenes arranged in superimposed panels (Stamatopoulou 2002, 413 ff.), in their iron versions exhibit only the characteristic pair of ribbed strips along their edges, and lack any additional decoration except for a palmette at the end, also executed *au repoussé*.

Indispensable components of shields in this type are proven to be the internal circular bands, which were not universally present in shields with bronze attachments. Due to their narrow width, these sheets typically retain their full width and are easily identifiable. However, they are frequently misinterpreted as *antyx* coatings, despite having very little in common with *antyx* sheets. It is evident that they were not intended to line both sides of the *antyx*, since they are flat in shape. Their width is too small for this purpose, and their diameter is disproportionately small in relation to the diameter of the *antyx*. All circular bands are plain, and bear pairs of ribbed strips along their margins.

The few shields from this group that retain their entire set of attachments are found to have had two handgrips. The addition of a second handgrip was not particularly common on shields with bronze attachments and is interpreted either as a spare grip or as one for use during the application of the *ὠθισμός* tactic, when it would be held by the man to the left of each hoplite to strengthen the firmness and cohesion of the front lines of the phalanx (Stamatopoulou 2004, 439-440).

The small attachments, bosses with hanging rings, ivy leaf-shaped bosses with or without rings, and handgrip attachments, were in most cases made of iron on these shields, however, there are also cases where bronze was used, and in the case of shield AI from the pyre of the tomb at Derveni, the attachments are made of silver.

Regarding the geographical distribution of the finds examined, it is evident that most of the shields with iron attachments known to date came from Macedonia and particularly from Central Macedonia. One example has been found in a Macedonian pyre in Thrace, and a multiple set of examples in Cyprus, regions that were under heavy Macedonian influence at this period.

The examples from central Macedonia, as well as all other examined finds, despite their geographical dispersal, exhibit notable constructional uniformity, both in the overall design of each shield and in their detailed features. It is indicative of their similarity that in the case of Tomb A of Derveni the attachments of the two shields were initially attributed to one, and only through a focused examination of specific differences was it possible to distinguish between them. While variations between the shields do exist, most notably in the shape of the armband base, which can be either rectangular or circular, and other minor variations, such as the material of the nails on the edges of the sheets, that may be either iron or bronze, these discrepancies are minimal and do not detract from the overall uniformity that characterizes the attachments. This consistency strongly suggests adherence to shared construction specifications.

With the exception of the fragments from the acropolis of Vergina, all other finds come from burial contexts, either graves or funerary pyres. But also the fragments of the acropolis of Vergina, are very likely to have been removed from a tomb, since it has been established by excavation, that following the city's destruction in the second half of the 2nd century BCE, various useful items, primarily metal objects, were collected from the city and necropolis and brought to workshops operating on the acropolis for processing and reuse (Faklaris, Stamatopoulou 2013, 176-177). Moreover, technical features of these finds confirm that the find from the acropolis of Vergina belongs chronologically to the group under consideration.

These shield remains come from tombs of the Macedonian and Cist types, or from grand funerary pyres, that contained various items of armor and weaponry, gold wreaths, equestrian items, including horse harnesses and equestrian depictions, as well as banquet-related items (parts of couches or banquet utensils).

Regarding the dating of the shields, the following is noted:

The tombs at Derveni, on the basis of the vases, jewelry and coins they contained, date to the late 4th to the early 3rd century BC (Themelis, Touratsoglou 1997, 183-185).

The unplundered Tomb II of the Great Tumulus at Vergina, which, similar to tomb A of Derveni, yielded two shields with iron attachments, one in the chamber and one in the pyre, was for decades chronologically dependent on the respective proposals for the identification of its occupants. However, following the publication of the numerous clay vessels of the funerary pyre and the burial chamber, its dating has been revised to after 317 BC a view that has not been challenged to date.<sup>10</sup>

The tomb at Agios Athanasios and the Tomb B at Katerini date to the last quarter of the 4th century BC. The Tomb of the Judgement at Lefkadia dates to the end of the first quarter of the 3rd century BC. (approximately 275 BC). The funerary pyre of Thracian Kavyli in the last 30 or 20 years of the 4th century BC, while the pyre at Salamis in Cyprus also dates to the end of the 4th century BC.

This is the chronology of the contexts of shields under examination that come from burial assemblages with largely resolved chronological issues. The same is not the case with the context of three of the finds. For the tomb at Louloudia Kitros, a more precise dating than the general attribution to after the middle of the 4th century BC was not possible due to the tomb being plundered.

Kinch's tomb at Lefkadia was dated by criteria that are no longer considered to be valid up to the middle of the 3rd century BC (Romiopoulou, Touratsoglou 1971, 164). The fragments from the acropolis of Vergina were found in a context that does not allow for an exact dating, providing only a *terminus ante quem*. However, on the basis of the examples that do allow a more precise chronological estimate (Derveni, Vergina, Agios Athanasios, Katerini, Tomb of Judgement, pyre at Kavyli and Salamis Cyprus), it can be determined that the finds under examination fall within the last quarter of the 4th century BC, with particular emphasis on the last fifteen years or decade of that century.

To summarize, the following can be concluded about the shields under consideration. They exhibit technological and morphological uniformity and occur in burial contexts located mainly in the central part of the Macedonian kingdom and in two other locations, Thrace and Cyprus, of pronounced Macedonian influence at that period. Moreover, their funerary use appears to have been concentrated in the last 15-10 years of the 4th century BC and specifically within

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<sup>10</sup> The initial dating in the publication of the tomb's pottery to the third quarter of the 4th century BC (Drougou 2005, 28 -61) was not accepted and was soon rejected. From the extensive relevant bibliography, see especially Rotroff 2007, 809 ff., and Borza, Palagia 2007.

tombs belonging to members of the Macedonian military elite. It is also noteworthy that these shields appear simultaneously during this period and indeed fully developed, without any evidence of gradual evolution or experimentation, and then entirely disappear, with no indication of continuation.

These observations, particularly the abrupt simultaneous appearance and disappearance, along with the short-lived existence of the shields with iron attachments, and their striking uniformity, suggest that their production was linked to a shared and specific historical military context, a need for large-scale military provisioning which took place in the geographical and chronological background determined by the time of their acquisition by the warriors that years later were buried with them. They can only be men of more or less the same generation and status, as the dating of their graves indicates. Their numerous shared features point to a highly organized and specification-controlled production, originating from a single center and probably - as suggested by their individual micro-variations - carried out in more than one workshop. This production would obviously be of considerable scale, since its products do not continue the standards of the earlier shield manufacture, but rather the shields are redesigned, with a new material for the attachments, which is now iron, the elimination of the old decorative burden and the simplification of production processes as its main features. Regarding the changes that may have been made to the wooden part of the shields, which was the most critical, the limited available evidence does not allow for meaningful comparisons.

The armies of the kingdoms of the period under consideration could no longer rely on the individual supply of armor by the hoplite, as had been the case in the democratic city-states, but rather practiced provision by the state, so that in large-scale military preparations, such as the Macedonian army's departure for Asia, the weaponry production would have been immense.

Since the internal attachments of the shields, with a thickness of less than half a millimeter, do not contribute to the strength of the weapon, which is based exclusively on its wooden part, but rather serve to secure the handles and to stabilize the adherence of the leather and cloth linings on the wooden body of the shield, the shift from bronze to iron for these attachments corresponds to the need to control the production costs, as iron was less expensive than bronze, and also to the advances in blacksmithing, which allowed for the forging of iron in very thin sheets reducing their weight, which has always been a primary factor for every piece of armor.

It is also noteworthy that the appearance of these shields coincides with the introduction of the iron helmet, which according to the archaeological finds and Plutarch's account (Plutarch, *Alexander* 3. 2. 9) dates to the course of Alexander's Campaign to Asia. Around the same period, a general breakthrough in weaponry was recently established: the use of iron that was introduced in other defensive equipment such as gorgets, breastplates, shin guards and primarily helmets (Faklaris 2025). It is evident that this major breakthrough can only have occurred within the context of a large-scale weapon production, which was part of a broader, similarly large-scale military preparation that took place in Macedonia during the early years of the reign of Alexander the Great.

It can thus be concluded that the shields with iron attachments are examples of the apparently massive production of weaponry that took place in Macedonia as part of Alexander's preparations for the campaign to Asia. The warriors who used these shields would have joined Alexander in this campaign, fought their way across Asia, and were among those who returned to Macedonia after the fall of the Persian Empire, bringing wealth back home. They end their lives mainly in the last fifteen or ten years of the 4th century, with some of them,

as is natural, preceding and others following this period by a few years. Therefore, these shields can be seen as tangible remnants of the most significant and decisive military operations of the Macedonian history, corresponding with technological advancements in metallurgy and armament.

These hoplite shields are the latest known examples of this type. According to Curtius, at the outset of the campaign the Macedonians and their horses were not noted for their gold and silver equipment, but wore iron and copper, in stark contrast to the luxury of the Persian army; however, as the campaign progressed successfully for the Macedonians this disparity would soon change (Curtius, *Historia Alexandri Magni* 3.3.26 and 8.5.4).

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ΑΙΓΙΔΑ

ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ  
Υπουργείο Πολιτισμού

ΧΟΡΗΓΟΙ



ΥΠΟΣΤΗΡΙΞΗ



ΜΕΓΑΡΟ  
ΜΟΥΣΙΚΗΣ  
ΑΘΗΝΩΝ