

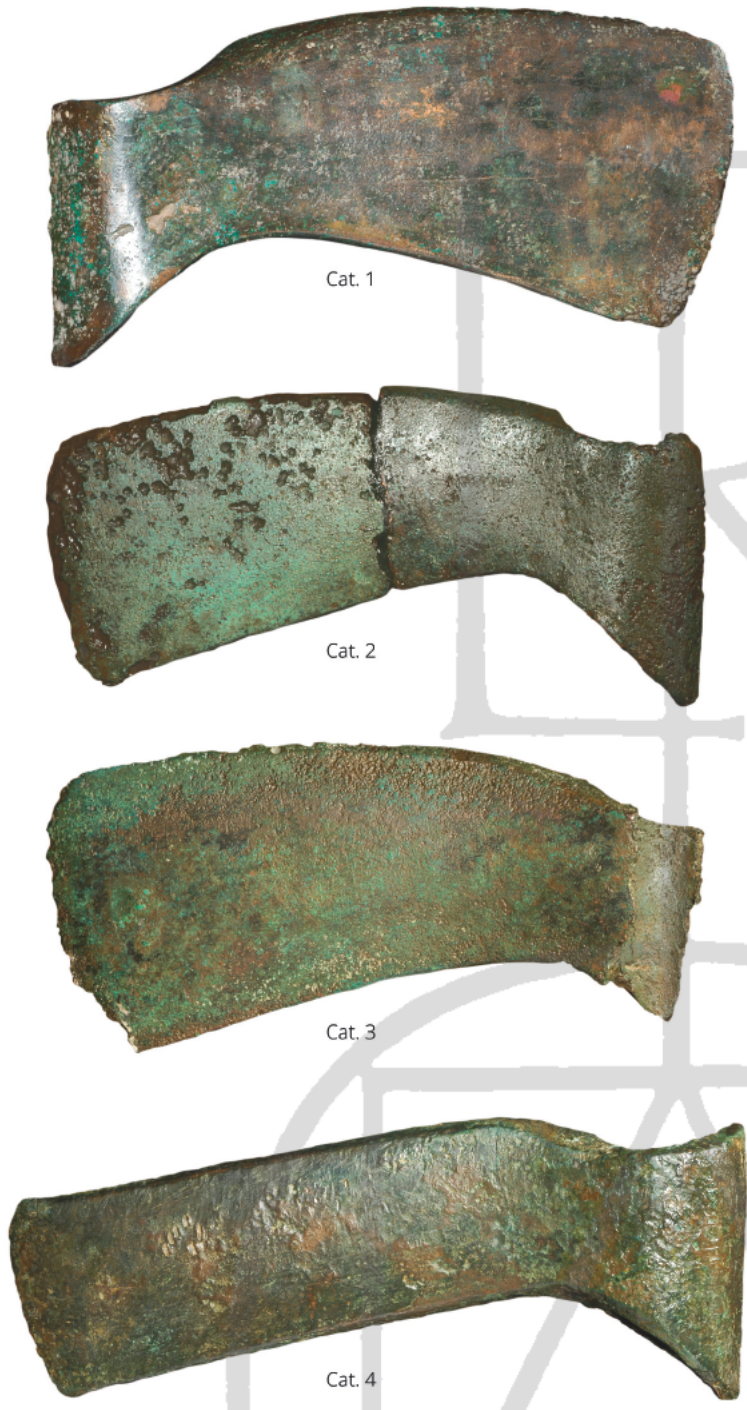
The Hoard of Rodotopi in Ioannina (Epirus, NW Greece) and the Copper Single-Edged Shaft-Hole Axes of the Early Bronze Age in the Helladic Area

Introduction

¹ The aim of the present study is to scrutinise a group of twelve cast copper single-edged shaft-hole axes from various sites in Epirus, starting from the hoard of Rodotopi. Typology and distribution in Greece and the Balkans, their manufacturing technology and use-wear are examined, while the results of their metallographic and chemical analysis are discussed. These artefacts are part of the wider context of production and utilitarian (weaponry, tools or units of weight and raw material) or symbolic consumption during the Early Bronze Age in the central Balkans. This early cultural ›koine‹ is characterised by both typological and technological elements, while it traces the networks of raw materials, ideas and commodities, trafficking in the specific areas of the Balkans.

² The hoard of Rodotopi¹ (Fig. 1) in the region of Ioannina was accidentally discovered in 1951 by an unnamed resident of the area and subsequently handed in to the archaeologist Sotirios Dakaris, without any other information on the exact conditions of its recovery. It includes two intact, as well as two broken, single-edged axes cast with circular shaft-hole. The Rodotopi hoard is today on display in the Bronze Age showcase of the renovated Archaeological Museum of Ioannina, in the first room with various other prehistoric antiquities. There, one can mainly see finds of the Late Bronze Age, as

¹ Dakaris 1954a, 148 no. 2. The epigraphic inscriptions of the M. n. c. p. a. M. se. m. o. ioannina and Aras single-edged axes show close affinity with the axes of the Rodotopi type. Dakaris 1981, 111 p. 4, 1. Kleitsas 2013, 102 g. 28 (and 108–111 g. 102–129).



1

Fig 1 The hoard of Rodotopi containing four single edged shaft hole axes (Cat. 1-4; scale 1:2)

well as the other two hoards of Stephani² in Preveza and Katamachi³ in Ioannina. The significance of the particular assemblage of this article was first noticed by the author during the works for the re-exhibition of the Ioannina Archaeological Museum permanent collections and subsequently analysed in his doctoral thesis (2013) at the University of Ioannina.

³ The basin of Ioannina is situated in the heart of the Epirus hinterland at an elevation of about 470–490 m a.s.l. Its long axis stretches for approximately 38 km in a SE-NW orientation and its width reaches up to about 10 km. The flatland of Rodotopi lies at the northwest end of the Ioannina basin, bordered on the west and the east by hill ranges (from Rodotopi and Megalo Gardiki to Neochori). Up until recently and before it was drained (1958), lake Lapsista occupied part of Ioannina basin immediately north of Rodotopi in communication with lake Pamvotis of Ioannina. A multitude of archaeological sites are dispersed across the wider district of the Ioannina⁴ basin, as well as in the environs of Rodotopi⁵, dating from the Palaeolithic period to modern times. Quite important too is the recovery of another three prehistoric metal artefacts⁶ in the specific area.

⁴ The identification of an Early Bronze Age presence still remains problematic, not only in the basin of Ioannina,

² Keksas et al. 2018, 73–107. The hoard was found in 198 and assigned to the Early Bronze Age.

³ Vooopoulos 1972, 112–119. The hoard was found in 1970 and is dated to the Early Bronze Age.

⁴ Darsis 1994, 80; Zachos 1997, 13–17; Pao 2007; Gravan 2007/2008, 179–234.

⁵ Pao 2007, 77–91, 97–99, 102–103, 129–142, 143. Pottery of prehistoric times is known from the Megalo Gardiki and from the Rodotopi area (Voropoulos et al.) – consists of handmade pottery with plastic decoration (K.), wheel-turned sherds (K.) and wheel-made plastic decoration (K.V.). In general, the chronological span extends from the Bronze Age, extending also to the Early Iron Age, while the handmade pottery of the Bronze Age onwards. Furthermore, handmade pottery of prehistoric date from the Rodotopi area was found at the Gora with the modern settlement and in the Bscave of the NW of the village.

These are a partly preserved and unpublished copper axe (Cat. 13), which was found in 19 in the Rodotopi, a copper single edged axe (Cat. 1) with circular shaft hole from the site of the Rodotopi (Hammond 1977, 332–333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

but also in the whole of Epirus⁷, with the exception of three archaeological sites. The first one is Doliana⁸, situated NW of the Ioannina basin in the area of the headwaters of the Kalamas river and the now dried-up Grammousti lake. There in 1990, the floor of a rectangular hut was excavated: it had two successive phases, yielding hearths, handmade pottery, clay spindle whorls, lithic artefacts, archaeobotanical and bioarchaeological remains. Four radiocarbon dates (3770–2925 cal BC) place it at the end of the Chalcolithic period and the beginning of the Early Bronze Age. The pottery finds parallels in specimens of the Attica-Kephala culture and the Rachmani phase at Pevkakia in Thessaly, but primarily in the Maliq IIb–IIIa phases of neighbouring Albania. The idiosyncratic Chalcolithic phase of the site has been called ›Doliana culture‹.

⁵ The second, the site of Goutsoura⁹ lies to the SW of Epirus and closer to the sea, in the basin of the Kokytos river headwaters: it was recently excavated by the Finnish Institute of Athens (Thesprotia Expedition). The Goutsoura settlement extends along the ridge of a hill, occupying an area of 0,1 ha. Taking up the baton from Doliana in the chronological sequence, its six radiocarbon dates define a span (2920–2400 cal BC) within phases I–II of the Early Bronze Age. After a hiatus of about 400 years (EBA III), a cremation burial of the beginning of the Middle Bronze Age cuts through the settlement stratum, while at a later stage a burial tumulus (end of the Middle Bronze Age) was erected over it. The settlement stratum contained handmade pottery, among which sherds of ›corded ware‹ stand out, along with clay spoons and spindle whorls, flint artefacts and fauna remains. The pottery finds parallels¹⁰ in Pevkakia, Bosnia, Bulgaria and Romania. Finally, of some interest¹¹ is a copper punch, a fish-hook and a copper prill, the latter being regarded as a remnant of metalworking activities in the settlement.

7 Papadopoulos 197, 272; the next seven sites from Epirus (Aeolos, Dodona, Ephyra, Kasriza, Korseo, Megalokorsara, Palaion) in the Early Bronze Age, remarking on the impossibility of subdividing into phases. Aramern 2004, 71–73; she classifies seven sites (adding the sites Vovopamos, Kasriza, Kasri, Doliana, Palaopyrgos, Meropi, Neochori, Pyrgos Ragos) in the Early Bronze Age. The dating of the above sites mainly based on fragments of handmade pottery with plastic decoration, which should be distinguished from terms of technology (manufacture, decoration, firing) during the Bronze Age. Dated with certainty in the Early Bronze Age is the site of Agamarna in Pedionion, which is confirmed by a coinage of Vasileos (Iozos) and from which a radiocarbon date (3330–3030 cal BC) has already been obtained.

8 Dozog Zachos 2002, 124–138–143; the Brasiava type of pottery (Maran 1998, 344–345, 1–4) stands out with its plastic decoration, dated with the passage, which is mainly encountered in central Greece, as well as in Albania (Majani, Podgorje) and in the Balkans (Serbia, North Macedonia). 2011, 132–29; the Pelomago-Doliana group has more in common with EBA than with the Chalcolithic material of Greece and therefore can be regarded as the earliest material in the EBA (Proo-Bronze Age) in Greece and dated with 201, 278–no. 73; she makes corrections, regarding the results of the archaeozoological analyses from Doliana (Dozog Zachos 2002, 138), a 100% sheep and goat (38.8%) > sheep and goats (3.1%) > pigs (12%), no dead of the ear of sheep and goats (3%) > pigs (12%) > cattle (8%).

9 Forsén et al. 2011, 79–82 (sites); Forsén, Forsén 2012, 297–301 (general description); Forsén 2011a, 12–133–138–141–143 (stratigraphy chronology); Forsén 2011b, 194–200–204–207 (handmade pottery); Forsén 2011, 7 (clay spoons). Dated with 201, 212–217 (notes on the sites); Papayannis 201, 227–243 (various materials); Dated with 201, 212–287 (animal bones, pigs > sheep and goats > cattle).

10 Forsén 2011b, 204–207; the archaeozoological and herpetology.

11 Papayannis 201, 229–231; the three copper or copper alloy objects date to the Early Bronze Age.

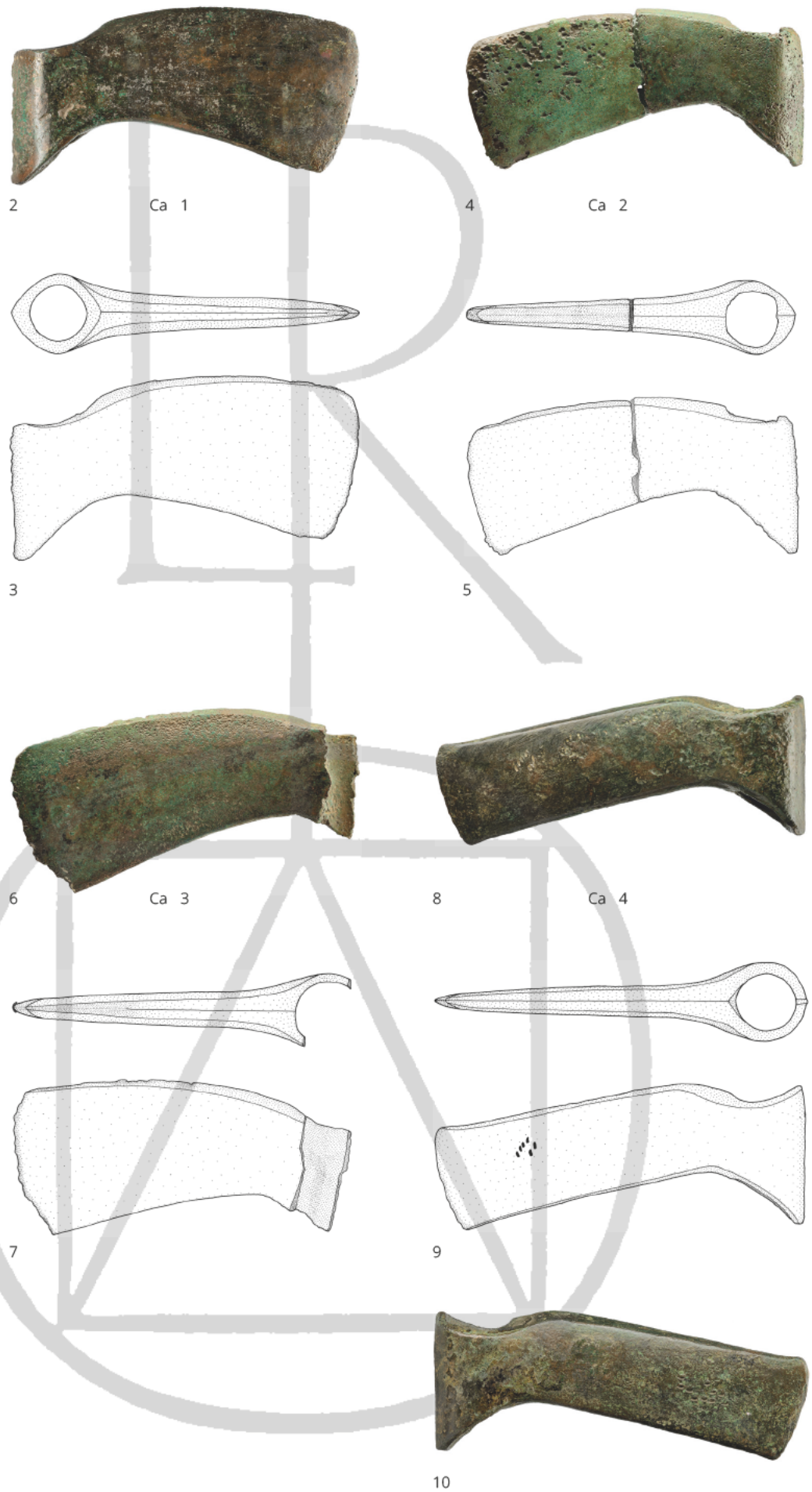
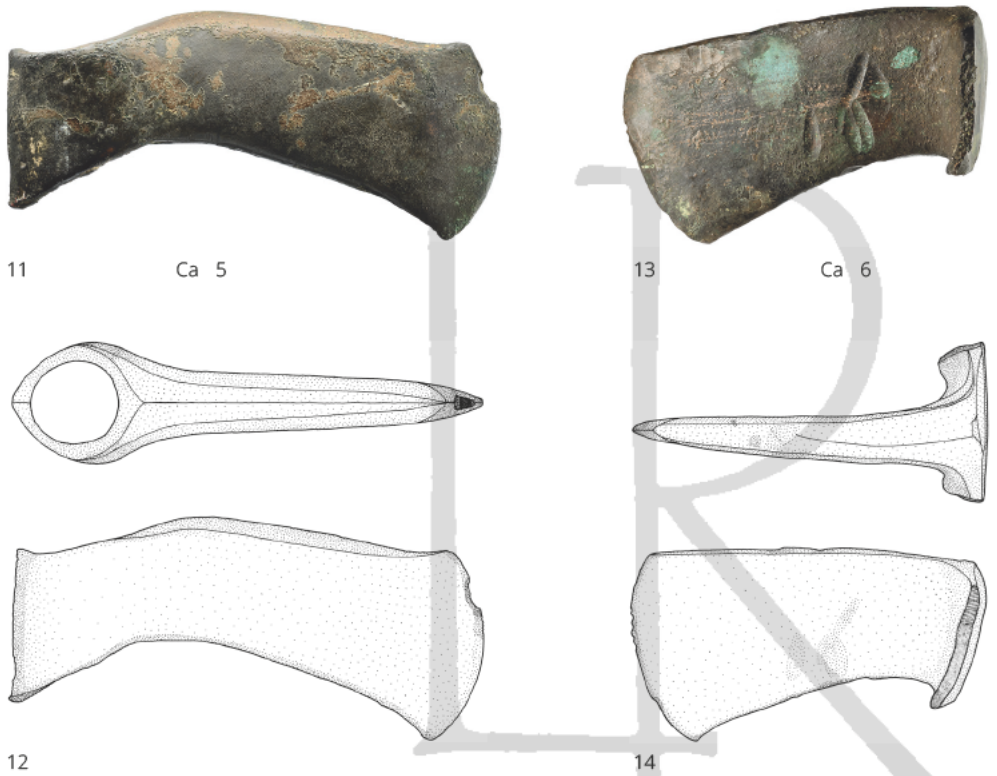


Fig. 2-10 Rodotopi, single-edged shaft-hole axes from the hoard (Ca 1-4; scale 1:3)



Cast Copper Single-Edged Shaft-Hole Axes

6 A particular group of twelve copper or copper alloy single-edged axes¹² is made up of objects from eight different sites in the wider region of Epirus. These are axes with a circular shaft-hole towards the back and a usually angular or less often rounded butt-end. On the upper side their back is slightly raised in section towards its outside edges, whilst running along its axis, a central line or seam is usually visible, corresponding to the junction of the two stone mould halves, in which these artefacts were probably manufactured. More rarely, a similar line or seam can also be discerned on the lower surface of the axes, where too a large triangular shrinkage cavity is often observed: this is a result of the manufacturing process, discussed further below. As a rule, the blade is larger in its height than the butt-end and preserves quite a few traces of use-wear in most of the examples or has become completely blunted in most of the cases.

7 An assemblage of four axes (Cat 1–4; Fig 1 2 3 4 5 6 7 8 9 10) forms the hoard of Rodotopi¹³ in Ioannina, of which one (Cat 4; Fig 8 9 10) displays six leaf-shaped notches on one side and ten on the other, in a probable attempt to fashion a high indiscernible marking (as discussed further below). Yet another axe (Cat 5; Fig 11 12) of the type was found a little further south in the area of Lofiskos¹⁴ (former Tsergiani) in Ioannina. Even further south at Terovo¹⁵ in Ioannina and in the Louros river valley two more artefacts were uncovered. The first one (Cat 14) is today lost, without any recorded information on its shape and dimensions. The second (Cat 6; Fig 13 14) is fragmented, with a part missing from the rear of the shaft-hole and the butt-end. In a secondary

Fig 11 12 ofis os, single edged shaf hole axe (Ca 5; sca e 1 3)

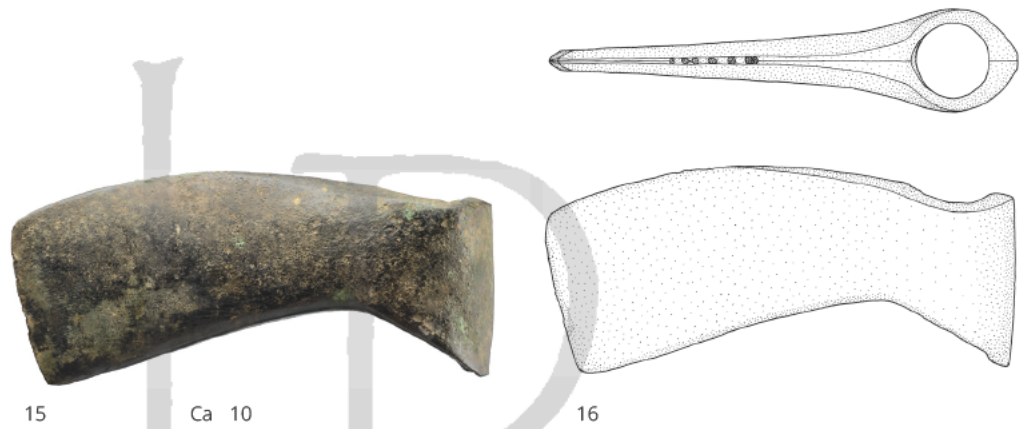
Fig 13 14 erovo, single edged shaf hole axe (Ca 6; sca e 1 3)

12 The dimensions vary as follows: length 13,8–18,8 cm, blade height 3–7,7 cm, butt-end height 2–7,0 cm, overall diameter of shaft hole 2,8–4 cm, inner diameter of shaft hole 2,4–3 cm and weight 3–14 g.

13 Op c. (no e 1) From the region of Rodotopi a so comes an unpublished cast copper axe (Ca 13).

14 Hammond 19 7, 332 g 22 p 21. The men on the saw in C. o. s' possess on a Ioannina in 1937.

15 Hammond 19 7, 332. Andrea 1983, 232. The second one was found at Chanio Terovo and handed in by Z. Zos.



15 Ca 10

16

Fig 15 16 Pistiana, single edged shaft hole axe (Ca 10; scale 1:3)

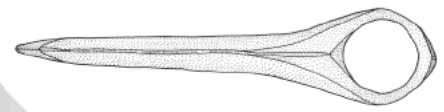
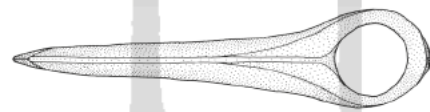


Fig 17 Ziros, single edged shaft hole axe (Ca 7; scale 1:3)

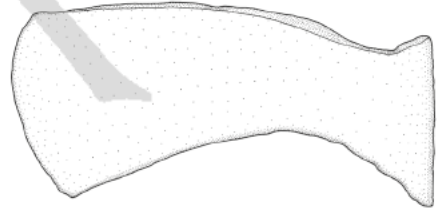
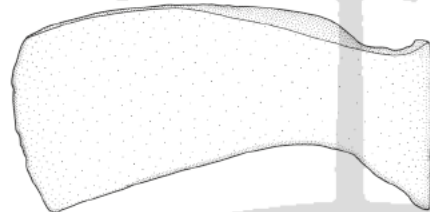


Fig 18 Arta, single edged shaft hole axe (Ca 8; scale 1:3)

17

Ca 7

18

Ca 8

Fig 19 Vlaherna, single edged shaft hole axe (Ca 9; scale 1:3)

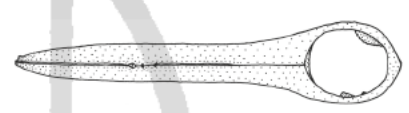
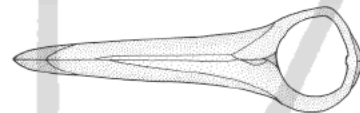
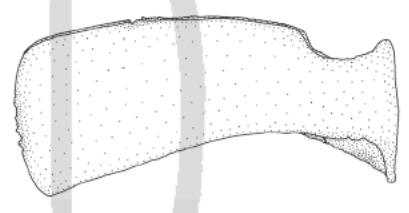
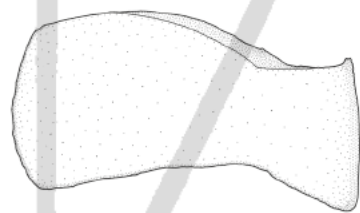


Fig 20 Loutra, single edged shaft hole axe (Ca 11; scale 1:3)



19

Ca 9

20

Ca 11

use, the broken sides of the hole were hammered flat, thus transforming the by then blunted axe into an anvil/wedge (a unique occurrence). Four more axes¹⁶ are known from the area of Arta. The first one (Cat 10: Fig 15-16) comes from Pistiana (former Siroupolis) in Arta, the second one (Cat 7: Fig 17) from Ziros in Philippiada, the third one (Cat 8: Fig 18) from the area of Arta in general and the fourth one (Cat 9: Fig 19) from Vlaherna in Arta. The twelfth axe (Cat 11: Fig 20) of the type was found at Loutra¹⁷

1 Hammond 1973, 332; g 22. Konsan apanodmos 2008, 19-3. The handle is not shown, while the other one was found by the archaeologist P. Karazenis at the site of Agios Neofanis in Vlaherna in 1994.

17 Hammond 1973, 332; g 22. It is a so-called and so-called from A. O. O. Arnan.

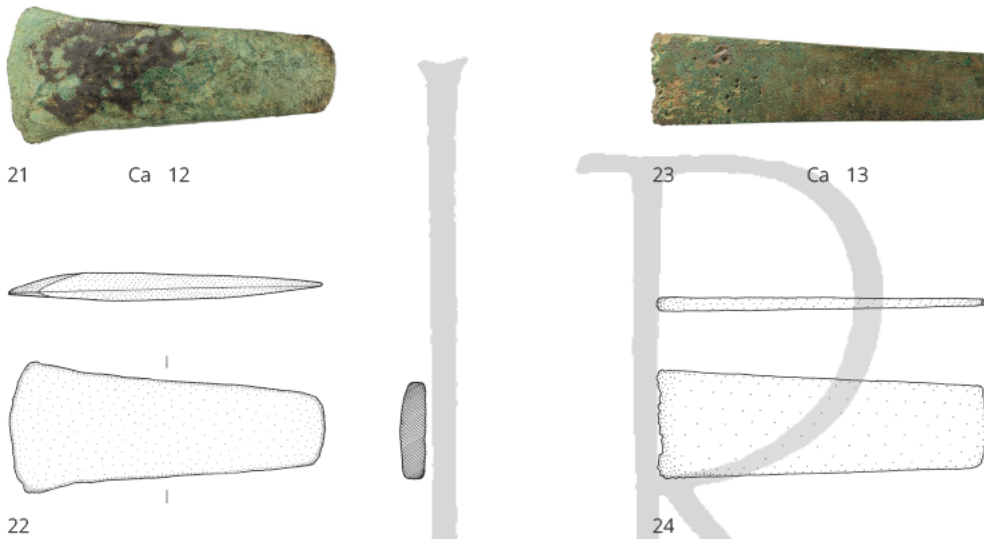


Fig 21 22 Ana o ,
fla axe/ch se/adze
(Ca 12; sca e 1 3)

Fig 23 24 Rodo op ,
rear par of fla ch se
(Ca 13; sca e 1 3)

in Amphilochia, just outside Epirus on the east side of the Ambracian gulf. Finally, we should mention two unpublished tools of different types, which in all probability are to be dated somewhere in the Early Bronze Age. These are a cast flat axe/chisel/adze (Cat 12: Fig 21 22 from Anatoli in Ioannina) and a copper flat chisel (Cat 13: Fig 23 24 from Rodotopi in Ioannina). Their types are quite common in the Helladic area, the Balkans and Europe throughout Bronze Age.

8 Earlier researchers¹⁸ in Epirus assigned the chronology of these particular copper single-edged axes to the final phases of the Late Bronze Age. Hammond maintains that the typological group of these axes prevailed in the Laibach culture of Slovenia at the north end of the Adriatic sea. From there, it spread across the Danube river valley, then was adopted by the Urnfield culture in Hungary and expanded eastwards into Bulgaria. The same view is also held by Papadopoulos, who supports a probable local manufacture. At the same time, another group of researchers¹⁹ correctly placed these specific artefacts in the Early Bronze Age, a period that at the time was completely unknown in the region of Epirus. Their early chronology is substantiated by typological and archaeometric data, as it will be seen further below, since they are made from copper-arsenic alloys (Cu-As).

9 Another fourteen copper or copper alloy single-edged axes of the Early Bronze Age are recorded from the rest of the Helladic region, eleven out of which come from Macedonia. The biggest assemblage of four artefacts is included in the hoard of Petralona²⁰ in Chalkidiki (also comprising thirty-eight flat chisels). All of the axes are broken at the same point just before the blade (on two the blade is missing, while a third one preserves only the blade). A similar copper axe is reported from the site Latomeia of Triadi²¹ in Thessaloniki. There also are three more surface finds²²: two from the archaeological sites of Mesimeri Toumba and Plagiari Toumba in the Chalkidiki in Macedonia and a third one, now missing, from Mesimeriani Toumba at Trilofos in the same region. Finally, one axe occurred at each one of the following sites: Mandalo²³ in Pella (excava-

18 Hammond 1977, 332; Fig 22 Papadopoulos 1977, 298; Moore 2001, 10

19 Vignac 1970, 37; Maran 1989, 130; Maran 2001, 277

20 Grammenos 1994, 82-98, 100; Maran 2001, 27-284; was found in 1988 in Petros (EBA)

21 Grammenos 1994, 89. A random and so-called find of 1970, made of pure copper

22 Grammenos 1994, 89-91. Found in 1973 and in 1971. The first two are made of a copper alloy with low arsenic content (Cu-As), while the third one is not known

23 Papanicolaou, Papanicolaou, Papanicolaou 1989, 24 p. 370

tion find, Arhontiko in Giannitsa and a recent one at Paliouria²⁴ in Grevena, probably belonging to a small hoard (with two more flat chisels). The last three single-edged axes in the Helladic area are encountered in the hoard of Thebes²⁵ in Boeotia, in the hoard of Poliochni²⁶ rosso on Lemnos and in the hoard of Dhaskalio²⁷ on Keros. The few single-edged axes, which are datable, all belong to phases II–III of the Aegean Early Bronze Age. To justify their dating to the same period, not only is there typological evidence from the neighbouring Balkans available, but also data from the archaeometric analysis of the Epirotic axes themselves, as discussed below.

¹⁰ Likewise, six pieces of bivalve stone moulds are known in the Helladic area, of which five come from the regions of central and west Macedonia. The first is a surface find from Mesimeri²⁸ Toumba in Chalkidiki, while the second one was found at Agios Mamas²⁹ Toumba in Chalkidiki and is published in an exemplary manner. Two more pieces of stone moulds come from the settlement of Kryopigado at Aliakmonas³⁰ in Kozani and another one from the settlement of Anargyroi³¹ on the shore of the Cheimaditis lake in Florina. A piece of a sixth stone mould was located in the ›Minoan‹ neighbourhood of the settlement at Koukonisi³² on Lemnos. Finally, part of a single-use clay mould for the manufacture of a single-edged axe occurred at the settlement of Poliochni³³ on Lemnos. The latter provides clear evidence for the practice of the ›lost-wax‹ casting technique, being known already in the Early Bronze Age.

¹¹ Vulpe (1970) has established the principal typological classification of the Balkan copper and bronze single-edged axes with a circular shaft-hole, which remains effective to the present. All Epirotic examples belong to the first variety of the type with the conventional name Veselinovo (after a site in Bulgaria), whose date falls within the Early Bronze Age. Assigned to the same category of axes are three examples, one piece from Mesimeri Toumba and Plagiari Toumba in Chalkidiki, and Paliouria in Grevena, to go with three stone moulds from Mesimeri Toumba and Agios Mamas Toumba in Chalkidiki and alongside one of the two moulds from Kryopigado at Aliakmonas in Kozani. The second variety of the Veselinovo type is typological and chronological evolution from the first one, including a stone mould from Koukonisi on Lemnos, which should probably be associated with the fourteen axes from the hoard of Ostrovul Corbului³⁴ II in Romania. This specific type predominates as the most characteristic group of copper

-
- 24 Karamanos *Menes* 2011, 84. This is an important new and basic unpublished find.
- 25 Maran 1989, 129–131. The hoard was found in 1945 in the depression under the door of an apsidal building and consists of copper/bronze axes (double-edged axe, single-edged axe, three chisels and an awl).
- 26 Bernabò Brea 1944, 1, p. 173. The hoard was found in room 829 of the red period of Megaron 832, with twenty copper/bronze objects (axes, spearheads, daggers, awls, a pin and a small shoo).
- 27 Georgakopoulou 2013, 73–77. The hoard consists of three axes (single-edged axe, axe adze and a chisel), the single-edged axes made of a copper alloy (Cn) and preserved in a poor condition (as was probably an experiment). This also preserves remarkable traces of metalurgical activities (mainly copper and lead).
- 28 Grammenos *Zach* 1994, 90. Was found in 1920 in the settlement area.
- 29 Hänse 2003, 47–48. On the wooden axes are characteristic depressions or casting single-edged axe and a ring-shaped dagger, the most characteristic characteristics of the Early Bronze Age, in general.
- 30 Karamanos *Menes* 2011, 312–320. From phases 2 and 13a. On the double-edged hammers here are preserved irregular arrangements, mainly of a circular shape, although they are not decorative. These niches could be interpreted in two different ways: either the conical hammering or the second casting stage of the casting, by preventing the creation of cracks (they would be then removed from the end product by hammering or even by polishing during the finishing process).
- 31 Zografou 1997, 48. This settlement preserves many remains of the site.
- 32 Boutsika 2009, 201–202 (modified 203). Important metalurgical activities were carried out in the settlement of Kozani phase, which dates to Middle Minoan B and Minoan Rans. On the modified spades, which are decorated and worked in the open, the presence of the workshop, which bears an inscription on one narrow side, the occurrence of the mould in a series can be seen as an interesting even or interpreted in the context of an iron and conical mould on metalurgy, some of which have remains to be proved.
- 33 Bernabò Brea 1944, 91, p. 8. Napolitano 1997, 38. From a workshop of Megaron 0 of Poliochni *verde*.
- 34 Vulpe 1970, 3–37, p. 37. Even occurrences are mentioned in Romania and elsewhere in Bulgaria.
-

single-edged axes in the Helladic area, since more than half of the axe and mould occurrences (fourteen out of twenty-six axes and four out of seven moulds) belong to it. Its principal distribution cluster is encountered in the regions a bit further to the north and east in the Balkans (mostly in Romania and Bulgaria).

¹² Six copper or copper alloy single-edged axes of the Veselinovo first variety were found at sites in Romania³⁵, along with a piece of a stone mould in the Cernavoda settlement (phase III). Eight more occurrences are known from sites in neighbouring Bulgaria³⁶. Finally, two axes with the traits of the type come from Albania³⁷, an immediate neighbour of Epirus, while a final example is reported from distant Hungary (site Lapujtő). In total, thirty-one single-edged shaft-hole axes and four moulds of the first variety are known from the Balkans.

¹³ The distinction of artefacts and their classification into types is not always an easy matter. The four single-edged axes from the Petralona hoard in Chalkidiki and a fifth one from Triadi in Thessaloniki belong to Kozarac³⁸ (or Izvoarele type, as does one stone mould from Kryopigado at Aliakmonas in Kozani and the clay one from Poliochni on Lemnos). The type is quite widespread in Serbia³⁹ and in Bosnia⁴⁰, where five pieces of clay moulds were also uncovered in two settlements (Debelo brdo and Gradina Al'ihodže) of the Vučedol culture. A piece of a stone mould comes from the site Pecica in Romania and again of a clay one from Salzburg in Austria, while one specimen occurred at each one of the following sites: Vinkovci in Croatia, Vel'ký Meder in Slovakia and Csáklya in Hungary, raising the number of known moulds of the type to twelve. We complete this survey with the last five Helladic axes (Arhontiko in Giannitsa, Mandalo in Pella, Thebes in Boeotia, Poliochni on Lemnos and Dhaskalio on Keros, along with the last stone mould from the settlement of Anargyroi on lake Cheimaditis in Florina), classified in two relatively close types, bearing Vulpe's conventional names Patulele⁴¹ and Padureni⁴².

³⁵ Vulpe 1970, 3–37 p. s. Şe an 2007, 83–88. These are the sites of Căcea (hoard with three examples), Crivăţ (semen o G n a c re), h P ngă e ş (hoard) and an n nown s e n Roman a.

³⁶ Chernykh 1977, 29–3; Chernykh 1978, 13–12. These are the sites of Veselinovo, Gabrovo, Ev'evo, P'ovd'v, Bra'sgovo, ara Zagora (wo) and an n nown s e n B gar a.

³⁷ Prend' B ng r 2008, 241–243. ab. These are the sites of Rrëmbec Korçë and D'vja ë shnjë.

³⁸ Vulpe 1970, 39–41 p. s. 8–70. He reports occurrences at sites in Romania, Hungary, Serbia, Slovenia, Macedonia and Moldova, as well as in the hoard of Kôm'ód in Hungary (ve) and of B'obon'urane (wo).

³⁹ Anonov'ć 2014, 90–92 p. s. 37–39. He describes the two varieties of Jas'ina and Barandina. In the case of the latter, axes

⁴⁰ Žeravca 1993, 22–32 p. s. 8. He studied with his colleagues seven axes from Bosnia and Croatia, among which here is a silver axe (with a gold dagger) from the central part of the area. Ma'grda in Montenegro. Hansen 2001, 11–9.

⁴¹ Vulpe 1970, 37–39 p. 7. Occurrences in Romania, Bulgaria, Serbia and one in Albania.

⁴² Vulpe 1970, 42–48 p. s. 8–11. He includes seven varieties from Hungary and Romania.