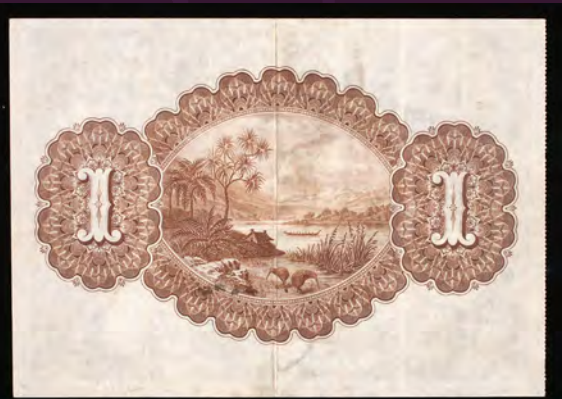


Volume 29

Journal of the Numismatic Association of Australia



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President's Report

Our eighth biennial international numismatic conference (NAAC2019) was held at the State Library of New South Wales. National Organiser Walter Bloom and the local Organising Committee of Ken Sheedy and Gil Davis put together an interesting program, the fruits of which can be seen in this current volume of the Journal. Highlights included keynote speakers, Ross MacDiarmid, RAM Director (*The future of collecting and the role of the Royal Australian Mint*) and Claire Rowson, Perth Mint (*Mint Condition: New directions for numismatic conservation in Australia*). We were pleased to see a strong New Zealand contingent in Sydney and for the first time in some years the conference ran at a (slight) profit.

I am delighted to advise the winning of the 2019 Paul Simon Memorial Award by Graeme Petterwood. Graeme has been very active on the Tasmania numismatic scene, even when the Tasmanian Numismatic Society had spent a significant time in hibernation. Over this crucial period he kept the Society on the numismatic map with his publishing of the bi-monthly newsletter *Tasmanian Numismatist*. Graeme's contribution to the Society has been recognised with the McDonald Encouragement Award, 1994; R V McNeice Literary Award 1995, 1996; Lockwood Medal 1998; Tasmanian Numismatic Society Bronze Medallion 1996, 2000, 2003; TNS President's Award 2000; TNS Distinguished Service Medal 2013; and TNS Life Membership 2014. Graeme also won the André Fecteau Prize (Association des Numismates Francophones du Canada; <http://anfc.info/>) literary award. Congratulations Graeme from the Australian numismatic community.

The NAA website has experienced some serious issues, well beyond my expertise as Website Manager. After many unsuccessful attempts at fixing the problems, both through the hosting company and the website developer, the Association is looking to pay an expert to get the website back on-line.

We continue to enjoy sponsorship at a sustainable level, with Noble Numismatics (Gold), Coinworks, Downies (Silver), Drake Sterling, Mowbray Collectables, Sterling & Currency and Vintage Coins & Banknotes (Bronze) all contributing to ensure the Association's continued success. However expenses are rising and receipts are falling, even with the steady level of membership. On the positive side, many continue to take out ten-year memberships which is certainly good for the short to medium term.

I am appreciative of the support of Council and other NAA members throughout the year, and particularly our Secretary, Jonathan Cohen, and Treasurer, Lyn Bloom, who are pivotal in the running of the Association, and our Managing Editor, Gil Davis, for his ongoing work with the journal. The Association is looking to hold its 2020 AGM in Perth with those members in the Eastern States invited to skype into the meeting. With 15 NAA members in WA including three Office Bearers, we should have no difficulty making a physical quorum.

Finally, I was sorry to miss this year in Sydney (due to illness), my first missed conference since their inception in 2005, and also my first missed AGM since I took up the Presidency in 2006.

Professor Walter R. Bloom

President, NAA

www.numismatics.org.au

Editor's Note

This journal is the showcase of the Numismatic Association of Australia (NAA), the peak body for numismatics in the country. It provides a venue for excellent scholarship with a requirement that all articles either offer new material or fresh interpretations. All submissions are required to undergo a rigorous, double-blind peer review. The 29th volume is the largest we have produced and comes as a result of a decision to combine 2018 and 2019 into one volume, with many of the articles generated from the biennial NAA conference held on 6-7 April 2019. Once again, there is a good balance of modern and ancient interests reflected in a remarkably diverse range of topics. It is pleasing to see the contributions made on New Zealand numismatics.

We have a strong international editorial board who contribute their wisdom, experience and help. I thank them and mourn the premature loss of one of our number, the late Professor Matthew Trundle whose obituary appears at the end of the volume. I thank Professor John Melville-Jones and Mr John O'Connor for their skill and application in proof-reading the articles and Mr Barrie Newman for his dedication in producing the volume. As always, I thank Professor Walter Bloom, President of the NAA, for his personal support and encouragement in dealing with the myriad of matters that editing a journal entails.

This volume has some changes from its predecessors. At the conference we ran a session in which a number of speakers gave a short presentation on a 'Numismatic Gem'. This was highly successful and amusing. Two of the presentations have been turned into brief articles including the winning entry by Darren Burgess on a 'humble' token from the English Civil War, and a charming story by Barrie Newman on his first coin, which led him to a lifelong interest in collecting. We have also included a review by David Rampling of the important book by Peter Lane on the South Australian 'Coin Cabinet'.

There are five articles on modern topics. The first two are about New Zealand with Andrew Clifford and Robert Tonner presenting a history of New Zealand banknotes, superbly illustrated from Robert's own collection, and David Galt following up with medals issued for the New Zealand Wars. Richard and Carmel S. O'Hair take us into the world of early Australian medals issued by a Geelong Highland society, while Darren Burgess provides a full listing and discussion of the Centenary of Sydney and Melbourne Commemorative medals. Yuri Rapoport suggests, perhaps controversially, that there is a fifth variety of the 1931 penny.

There are also five large articles on topics spanning a thousand years of ancient history. Lloyd Taylor provides an exemplary study of the Alexander tetradrachms that he attributes to the Phoenician port city of Karne. From there, we segue into the vexed question of the so-called Porus medallions of Alexander, explored in detail by Michael Habicht and his colleagues. Staying in the ancient East, Rachel Mansfield reattributes a previously incorrectly identified coin type minted in the Levantine port city of Jaffa under the Severan emperors. Bruce Marshall discusses the introduction of slogans to Roman republican denarii. Finally, Christian Cuello discusses the extent to which imperial authority was conveyed in the 'imitation' coinage of 'barbarian' rulers in late antiquity.

All the articles contain significant research providing the volume with enduring value. They are well written and informative. I hope you enjoy reading them.

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Articles must comprise original research on numismatic material including but not limited to Australasian numismatics (coins, tokens, medals, banknotes) or ancient or mediaeval numismatics. Manuscripts can be emailed to any member of the Editorial Board in your area of research, along with a copy to the Managing Editor.

The Karne Alexanders

Lloyd W. H. Taylor

Abstract

The northern Phoenician port city of Karne was responsible for three small, short duration emissions of Alexander tetradrachms in the period 327-224 BC. The coinage is rare, represented by a corpus of 29 known examples struck from seven obverse tetradrachm dies paired to 13 reverse dies, plus a single drachm die pair. Series 1 and 2 are Macedonian imperial tetradrachm emissions, struck in the period c. 327-320 BC, separated from each other by up to six years. Series 1 is dated to 327/6 BC based on the presence of iconographic detail identical to that found on the coinage of nearby Arados. Similar reasoning indicates that Series 2 dates to the interval 324/3-321/0 BC. It was possibly struck in 321/0 BC at the direction of Antigonos Monophthalmos, the strategos of Asia, in association with the passage of the Macedonian royal army from Triparadeisos into Asia Minor. Iconographic detail and style suggest that mint workers may have been mobilised from nearby Arados for each of Series 1 and 2, while technical factors, including the identification of what is possibly the first ferrous tetradrachm die in the Alexander series, suggest the alternative possibility that dies were manufactured at nearby Arados and shipped to Karne for the striking of coinage. Series 3 consists of a small emission of tetradrachms and drachms bearing the year 35 date of the Aradian autonomous era (225/4 BC), part of a co-ordinated regional emission, struck as a contribution from the cities of the Aradian Peraia to help finance the invasion of Asia Minor by Seleukos III.

Keywords

[Karne] [Arados] [Phoenicia] [Alexander the Great] [Alexander mints] [Hellenistic coinage] [die study]

Introduction

Karne was located on the northern Phoenician coast about 10 km north of the island city Arados, for which it served as a mainland port, naval base and arsenal.¹ It was the only mainland port on the northern Phoenician coast. Together with Arados, it passed into the hands of Alexander the Great without resistance², as he advanced south along the Phoenician coast in early 333/2³ BC. Prior to this, Karne did not strike coinage. However, two Alexander tetradrachms of early iconographic style (Price 3429-3430)

1 Strabo, *Geography*, 16.2.12.

2 Arrian *Alexander*, 2.13.8.

3 Where applicable, dates are referenced to the Macedonian lunar calendar year, which commenced in the Autumn (September/October) of our Gregorian solar calendar year.

were present in the Demanhur Hoard (IGCH 1664) that closed in c. 318 BC. Both carried the **K** mint mark, deciphered as KAP (*kappa, alpha, rho*), an abbreviation of the minting city's name, and were thus attributed to Karne during or immediately after the lifetime of Alexander the Great, in the period c. 328-320 BC.⁴ A century later, a single Alexandrine emission bearing the primary mint mark **K** and dated in Phoenician numerals to year 35 (225/4 BC) of the Aradian autonomous era was struck at Karne.

In 2002 a die study of the Karne Alexanders based on thirteen examples in the collections of the American Numismatic Society (ANS), the British Museum (BM) and the Bibliothèque nationale de France (BnF) was published by Duyrat.⁵ This was a small component in a broader study of the output of the northern Phoenician mints. Four obverse dies and five reverse dies were identified in this sample of the coinage and Duyrat expressed reservations with the attribution to Karne of the earliest component of the coinage (Duyrat Carné Série I). The reservations included the small size of the city, the absence of a precursor mint, the small size of the emission, and the otherwise unknown **K** mintmark in the Aradian hinterland.⁶ Unresolved questions are raised by the study and its interpretation. For example, two specimens of Price 3429 with the earliest iconographic style, and lacking the royal title, were sequenced after those of Price 3430. Yet the latter are of a distinctively later iconographic style and carry the royal title (BAΣΙΑΛΕΩΣ). No evidence was presented to contradict the attribution to Karne, and no alternative was considered. Through an analysis of a larger corpus, the present study examines the issues raised by Duyrat's interpretation and seeks to establish a coherent framework for the interpretation of the coinage and its significance in a regional context.

Catalogue

Obverse and reverse tetradrachm dies are numbered sequentially, prefixed A and P respectively (a and p for the drachms of Series 3). Coin weights are in grams. All coins were struck with parallel adjusted dies (variance 10h-2h). With the exception of Cat. Nos. 24 and 25, all the coins are illustrated on the accompanying plates. The concordance

4 Newell 1923, 117-119 and Price 1991, 432. Note the semicircular element, rather than a straight crossbar linking the arms of the K so as to define both letters A and P in the one ligature (refer Fig. 2). This semicircular crossbar serves to distinguish this mint mark **K** from similar mint controls bearing a straight crossbar, such as the otherwise indistinguishable ligate KAA used at the mint of Kallatis (Thrace) a century later. Unfortunately, Price 1991 incorrectly depicts the Karne monogram with a straight crossbar, rather than the correct semi-circular form.

5 Duyrat 2002, 37, 38 and 47.

6 Duyrat 2002, 37 ... « Cette série [Carné Série I] est présentée dans le catalogue à titre d'information : il nous semble en effet peu probable que Carné ait émis des alexandres. » (This series [Carné Series I] is presented in the catalogue for information purposes: it seems unlikely to us that Carne issued Alexanders.) Duyrat's Carné Series I comprises Series 1 and 2 of the current study.

of specimens with the earlier die study (Duyrat, *Ateliers*)⁷ is noted against the applicable catalogue entries.

Series 1

c. 327-326 BC.

Obverse: Head of Herakles r. in lion skin headdress, dotted border.

Reverse: ΑΛΕΞΑΝΔΡΟΥ on r., Zeus seated l. on *diphros*,⁸ holding eagle and sceptre, dotted border.

Κ in left field. (Price 3429; Duyrat, *Ateliers* 8-9)

1. A1-P1 17.23 New York, ANS 1944.100.35115; Duyrat, *Ateliers* 8.
P1 r. hand of Zeus depicted with facing open palm.
2. A2 -P1 17.22 New York, ANS 1944.100.35116; Newell (1923) no. 3267;
Newell (1912) no. 80, pl. 18, 7. Demanhur Hoard (*IGCH*
1664); Duyrat, *Ateliers* 9.
3. A2-P2 17.25 Numismatik Naumann 75 (3 Mar. 2019), lot 116.
P2 r. hand of Zeus depicted with facing open palm.
4. A2-P2 16.95 Berlin, Münzkabinett 18252045.
5. A2-P2 16.40 CNG 103 (14 Sep. 2016), lot 120.
6. A2-P3 17.22 Numismatik Lanz München 138 (26 Nov. 2007), lot 306.
P3 r. hand of Zeus depicted with facing open palm.
7. A2-P3 16.91 Sydney, NM2004.472 Nicholson Museum, The University of
Sydney.

Series 2

c. 323-320 BC most probably 321/0 BC.

Obverse: Head of Herakles r. in lion skin headdress, dotted border.

Reverse: ΒΑΣΙΛΕΩΣ in exergue, ΑΛΕΞΑΝΔΡΟΥ on r., Zeus seated l. on *diphros*,
or high-backed throne, holding eagle and sceptre, dotted border.

Κ in left field. (Price 3430; Duyrat, *Ateliers* 1-7)

8. A3-P4 17.10 London, BM 2002,0101.785; Hersh Coll. Reverse struck off-
centre, royal title, ΒΑΣΙΛΕΩΣ, off-flan.
P4 r. hand of Zeus depicted in profile, oriented upward, on this
and all subsequent reverse dies. Zeus seated on *diphros*.
9. A4-P5 17.27 London, BM 2002,0101.786. P5 Zeus seated on *diphros*.

⁷ Duyrat 2002, 37, 38 and 47.

⁸ The *diphros* was an ancient Greek stool without a back. The depiction of the *diphros* on Alexander the Great's coinage preceded that of the high-backed throne, which made its first appearance on his coinage following his return to Babylonia from his eastern anabasis; Taylor 2018, 18-19.

10. A4-P6 16.46 New York, ANS 1944.100.35121. Abu Hommos Hoard (*IGCH* 1667); Duyrat 7. P6 Zeus seated on *diphros*.
11. A5-P7 17.17 CNG 66 (19 May 2004), lot 247; Künker 71 (12 Mar. 2002), lot 196. The reverse heavily double struck, accompanied by a major die shift, so that the ground line and royal title appear to step down to the right beneath the leading leg of the *diphros*. A5 die in fresh unworn state.
12. A5-P7 17.17 London, BM 1911,0408.22; Price 3430a; Newell (1923) no. 3268; Newell (1912) no. 81, pl. 18, 8. Demanhur Hoard (*IGCH* 1664); Duyrat, *Ateliers* 4. P7 Zeus seated on *diphros*.
13. A5-P8 17.15 Berlin, Münzkabinett 18252047. P8 Zeus seated on high-backed throne.
14. A5-P8 17.16 London, BM 1886,0610.5; Price 3430b; Duyrat, *Ateliers* 1.
15. A5-P8 17.22 New York, ANS 1944.100.35118; Naville 1 (4 Apr. 1921), lot 894; ex-Pozzi Coll.; Duyrat, *Ateliers* 3. A5 spots of die rust between the strands of Herakles hair.
16. A5-P8 16.80 New York, ANS 1944.100.35117; Duyrat, *Ateliers* 2.
17. A5-P9 17.11 CNG 82 (16 Sep. 2009), lot 440. P9 Zeus seated on high-backed throne.
18. A5-P9 17.21 LWHT Coll. no. 312; Leu Numismatik Auction 4 (25 May 2019), lot 215. A5 die rust in and around the principle devices.
19. A5-P10 17.21 New York, ANS 1944.100.35119; Duyrat, *Ateliers* 5. P10 Zeus seated on high-backed throne.
20. A5-P10 17.20 New York, ANS 1944.100.35120; Duyrat, *Ateliers* 6. A5 extensive die rust disrupts engraved detail.
21. A5-P10 16.85 CNG 390 (2 Feb. 2017), lot 43. Extensive horn silver deposits on both sides. A5 well worn.

Series 3

225/4 BC.

Obverse: Head of Herakles r. in lion skin headdress, dotted border.

Reverse: ΑΛΕΞΑΝΔΡΟΥ on r., Zeus seated l. on *diphros*, holding eagle and sceptre, no border.

Tetradrachms

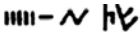
KA above palm tree and cornucopia in left field, Ϙ (Phoenician *beth*) beneath throne, IIII-~ HV (Year 35) in exergue. (Price 3431; Duyrat, *Ateliers* 35-38)

22. A6-P11 17.02 Gemini XI (12 Jan. 2014), lot 63.
 23. A6-P11 15.87 Paris, BnF 41796489; *Waddington* 7201; Babelon 915a; Seyrig (1964) pl. II, b; Duyrat, *Ateliers* 36 and 37 (pl. 3, 37).⁹
 24. A6-P11 15.1 Rouvier (1904) no. 741, pl. B, 16. Partially off-flan date misread as year 34 by Rouvier. Reverse die match confirms year 35.
 25. A6-P11 n.r. *BMC, Phoenicia*, pl. XXXVIII, 15.
 26. A6-P12 14.54 New York, ANS 1944.100.70952; Duyrat, *Ateliers* 35.
 27. A7-P13 16.75 Berlin, Münzkabinett 18253469.

Seyrig (1964) p.12, footnote 2 records another example of a Series 3 tetradrachm in the museum at Sofia. No image of this coin was located. It is from the same dies as the Berlin, Münzkabinett 18253469 (Cat. No. 27) according to Seyrig's footnote.

Absent from the catalogue of Series 3 is an example of Price 3432 (Duyrat, *Ateliers* 38) bearing the Phoenician letter \aleph (*gimel*) rather than \beth (*beth*) beneath the throne. The only recorded specimen of this type was described by Price¹⁰ as being "ANS photo-file (ex H. Syrig)." No example of this coin type could be found. It may be the result of a misreading of the Phoenician letter \beth beneath the throne of an image of the one of the coins listed as Cat. No. 23 or 24 (refer also footnotes 9, 28 and 29).

Drachms

Cornucopia in left field, \beth beneath throne,  (Year 35) in exergue.
 (Price –; Duyrat, *Ateliers* –)

28. a1-p1 4.09 Rauch 97 (14 Apr. 2015), lot 284.
 29. a1-p1 4.09 Obolos (by Nomos) 4 (21 Feb. 2016), lot 156.

Commentary

The catalogue consists of 27 tetradrachms and two drachms, emphasizing the rarity of Karne's Alexandrine coinage. Seven obverse and 13 reverse dies are represented in the catalogue of tetradrachms. A single die pair is identified in the Series 3 drachms. The only reverse die link identified in the sequence is between obverse dies A1 and A2, so that the sequence of dies otherwise relies on the interpreted progression of iconographic and epigraphic developments. The catalogue consists of three series, each characterized by distinctive iconographic elements and style, plus differing epigraphy. These parallel

⁹ Duyrat 2002, 38 identifies the same coin as two different specimens, BnF 41796489 and Seyrig 1964, pl. II, b, to which she attributes her catalogue numbers 36 and 37.

¹⁰ Price 1991, 432.

the progression of style and epigraphy found in various issues from the two mints at nearby Arados (Table 1).¹¹

Table 1. Characteristics and Affinities.

Characteristic	Affinity
Series 1	
Elongate style of the head of Herakles.	In the style of Arados II (Taylor, Arados II Series 3; Price 3424 attributed to Byblos).
Extended right hand of Zeus with open facing palm, fingers splayed.	A depiction that parallels that of the earliest output of the Phoenician mints.
Legs of Zeus disposed stiffly in parallel form.	Early iconographic style.
Feet of Zeus free-floating; no footstool or ground line.	In the style of early Arados II and later Salamis issues.
<i>Diphros</i> legs of a slender turned style.	In the style of early Arados I & II. Refer Duyrat, Arados Groups I-III and Taylor, Arados II Series 3.
Legend: ΑΛΕΞΑΝΔΡΟΥ	
Series 2	
Angular, square style of the head of Herakles.	In the style of Arados I (Duyrat, Arados Group IV, Series 4-11; Price 3316-32).
Extended right hand of Zeus depicted in profile, oriented upwards.	The same as that adopted in all the eastern mints by 326/5 BC.
Legs of Zeus depicted with his left drawn back slightly from right leg.	In the style of Arados I (Duyrat, Arados Group IV, Series 4-11).
Feet of Zeus rest on well-defined ground line.	In the style of Arados I (Duyrat, Arados Group IV, Series 4-11).
<i>Diphros</i> or throne legs of a heavy, square form.	In the style of Arados I (Duyrat, Arados Group IV, Series 4-11).
Legend: ΒΑΣΙΛΕΩΣ ΑΛΕΞΑΝΔΡΟΥ	Royal title adopted on coinage of Arados I, (Duyrat, Arados Groupe IV) from 324/3 BC.

¹¹ Included in the coinage of Arados is the coinage bearing a ligate AP mint control (Price 3422-8) formerly attributed to Byblos by Price. Following the analysis of Taylor (2020 in press) this coinage is now associated with a second mint at Arados; a Macedonian imperial agency mint, Arados II. This was a separate facility from Arados I, which initially was under the nominal direction of the vassal king (Gerastart, or Gerostratos in Greek) of Arados, in the tradition established when Arados was under Persian rule.

Characteristic	Affinity
Series 3	
Heavily stylised portrayal of the head of Herakles, lacking realism.	In the style of year 35 issues from Arados (Price 3380) and Gabala (Price 3433).
Busy, flamboyant reverse style.	In the style of year 35 issues from Arados and Gabala.
Secondary mint control beneath diphros.	Consistent with other contemporary issues of the Aradian Peraia.
Dated in Phoenician to Aradian year 35 (225/4 BC).	Co-ordinated issue with other cities of the Aradian Peraia.
Legend: ΑΛΕΞΑΝΔΡΟΥ	Parallels that of year 35 issues from Arados and Gabala.

Series 1

Series 1 consists of seven specimens struck from two obverse and three reverse dies (Cat. Nos.1-7; Plate 1, 1-7). No other denominations are associated with this emission. The two obverse dies are almost identical, subtly differentiated by the detail of the creases in the lion skin headdress, the neck tie of the headdress and the neck of Herakles, plus the relative sizing and disposition of other design elements. Similarly, the three reverse dies of Series 1 are of identical style. Indications are that all Series 1 dies are from the hand of a single engraver. The style of the obverse dies resembles some of the earliest examples of Arados II (Price 3424 attributed to Byblos by Price),¹² an example of which is illustrated for comparison on Plate 1, A.¹³ This style is also very close to some of the later coinage from Salamis (Price 3139) an example of which is shown on Plate 1, B.¹⁴ The reverse depicts Zeus seated on a *diphros* with his legs disposed side by side in parallel, while his closely spaced feet are free-floating, resting neither on a footstool, nor on a ground line. The latter portrayal is unusual among the northern Phoenician mints, limited to the earliest issues of Arados I¹⁵ and II.¹⁶ The depiction of the free-floating feet also closely resembles that found on Alexander issues of Salamis (Price 3139) that were struck commencing c. 325 BC (Plate 1, B). This similarity was noted by Newell as of potential significance for the attribution to Karne.¹⁷ However, as discussed below, the detailed iconographic association with the earliest issues from the mints at Arados is even more apparent, and more consequential.

¹² Taylor 2020 in press, Arados II Series 3.

¹³ ANS 1944.100.34998. Arados II, Price 3424 (Byblos of Price).

¹⁴ ANS 1944.100.34020. Salamis, Price 3139.

¹⁵ Duyrat 2005, pl.1, Groups I-III.

¹⁶ Taylor 2020 in press, Arados II Series 3.

¹⁷ Newell 1923, 118 ... "Details of the reverse, however, such as the position of Zeus' feet coupled with the total absence of any footstool, resemble the issues of Salamis in Cyprus. Now the important seaport of Salamis lies directly opposite Carne and was no doubt connected to it by ties of commerce."

Based on iconographic detail, Series 1 is a contemporary of the earliest emission from Arados II, while the Salamis emission postdates Series 1. The Arados II style of portrayal of Zeus with free-floating feet influenced that of Karne Series 1 and subsequently that of Salamis. This relative chronology is determined from the differing detail of the outstretched open facing palm right hand of Zeus on Series 1, analogous to that of the earliest Arados II tetradrachms, versus the chronologically later hand in profile depiction of the otherwise stylistically similar Salamis issue.



(Cat. No. 3)



(Cat. No.18)

Figure 1. Extended right hand of Zeus: Series 1 (No. 3) and Series 2 (No. 18)

On Series 1, Zeus's hand is depicted with an open facing palm and splayed fingers (Fig. 1) that is a characteristic of the earliest issues from the eastern mints of Alexander III that operated prior to 326/5 BC. After this date, throughout the eastern mints the right hand of Zeus was consistently portrayed in profile, oriented upward.¹⁸ At Arados II, the change in the portrayal of the extended right hand of Zeus is dated to *c.* 327/6 BC midway through an emission that most probably commenced a year earlier in 328/7 BC.¹⁹ Based on the affinity of Series 1 with the earliest issues of this mint, located offshore 10 km to the south of Karne, it is likely that Series 1 dates to around 327/6 BC.

Table 2 presents the statistics of the catalogue and the estimated size of the Series 1 emission derived from the application of the geometrical model of Esty²⁰ combined with an average obverse die life as suggested by Callataÿ.²¹ In the catalogue, Series 1 coinage is somewhat undersampled with respect to the obverse dies, indicated by a statistical coverage (*Cest*)²² of 0.86. Within the 95% confidence interval²³ as few as two dies and as many as five dies may have been used in the striking of Series 1, with the estimate being three obverse dies. The latter may have struck around 60,000 tetradrachms, which at an indicated weight standard of 17.2 grams per tetradrachm (Metrology below), would be equivalent to approximately 40 Attic talents of silver.

18 Taylor 2018, 31-35 for an analysis of the regional timing and significance of this change in iconographic detail.

19 Taylor 2020 in press.

20 Esty 2011, 46 formula (1).

21 Callataÿ 2011 suggests an average tetradrachm die productivity of 20,000 coins.

22 Esty 2006, 359, formula (1); Esty, 2011, 49 formula (3). This defines the probability of the identification of a new die in any addition to the catalogue as being 14 percent (1-*Cest*).

23 Esty 2006, 360, formula 4.

Table 2. Statistics: tetradrachm obverse dies.

	Series 1	Series 2	Series 3
Sample size (n)	7	14	6
Observed A dies (d)	2	3	2
Singletons (d_1)	1	1	1
Characteristic index (n/d)	3.5	4.7	3.0
Coverage ($Cest$)	0.86	0.93	0.83
Estimated original A dies ($Dest$)	2.8	3.8	3.0
95% Confidence interval	1.6-5.3	2.6-5.6	1.6-6.5
Estimated no. coins	c. 60,000	c. 80,000	c. 60,000
Attic talents of silver	c. 40	c. 53	c. 39

Series 2

Series 2 is differentiated from Series 1 by a later iconographic style and the presence of the royal title, ΒΑΣΙΛΕΩΣ. It is represented in the catalogue by 14 tetradrachms (Cat. Nos. 8-21; Plate 2, 8-21). The three obverse and seven reverse dies of Series 2 are of a uniformly consistent style, apparently engraved by a single die engraver, albeit a different engraver from the one responsible for the Series 1 dies. The elongate form of head of Herakles of Series 1 is replaced on Series 2 by a more angular square form that most closely resembles some of the later emissions of Arados I (Price 3316 -3332; Duyrat Group IV, Series 4-11)²⁴ an example of which is illustrated on Plate 2, C²⁵ for comparison. The reverse of Series 2 depicts Zeus with his left leg (that closest the viewer) drawn back from the right, with both feet resting on a ground line. Series 2 coins bear the royal title ΒΑΣΙΛΕΩΣ in the exergue beneath the ground line, a feature shared with the Group IV issues of Arados. The reverse of Series 2 initially depicts Zeus seated on a *diphros* (reverse dies P4-P7), followed by the depiction of a high-backed throne (reverse dies P8-P10). The throne back on the latter is defined by a simple, unadorned vertical upright to the right of Zeus's back. This back support is barely visible on the less well-preserved examples of the coinage. On both depictions the seat sits upon heavy, squared legs, rather than the more delicate, turned cylindrical elements that define the legs of the *diphros* on Series 1.

The epigraphy plus the style and detail of the iconography of Series 2 have a direct parallel at Arados I in the issue of Duyrat's Group IV, Series 4-11 (Price 3316-3332). Earlier, in Duyrat's Group IV, Series 1 (Price 3309) the royal title appeared on the coinage. During the mintage of Duyrat's Group IV, Series 4 the turned cylindrical legs of Zeus's

²⁴ Duyrat 2005, pls. 3-7.

²⁵ ANS 1944.100.34712 Arados I (Price 3316).

diphros developed into a heavier square leg, although a few examples of the preceding turned leg persisted into Duyrat Group IV, Series 5 (Price 3320). Concurrently with this development, there was a change in the depiction of the legs of Zeus from the stiff, parallel legs portrayal that is a characteristic of the earlier issues of Arados, to a more fluid portrayal in which the left leg of Zeus is drawn back from the right, with the left foot placed against the leading leg of the *diphros* (Plate 2, C). This portrayal of the legs of Zeus is intermediate between the early, stiff parallel leg depiction and the later crossed leg style that became the norm in most of the eastern mints by around 320. These changes of style, the altered depiction of the legs of Zeus, and the throne legs that are observed on Duyrat Group IV, Series 4-11, suggest that Karne Series 2 is broadly contemporaneous with this Arados emission. Such being the case, the mintage of Series 2 occurred at some time in the interval 323-320 BC.

The portrayal of the extended right hand of Zeus on the coins of Series 2 is that of a well-defined hand in profile, facing upward (Fig. 1). This contrasts with the Series 1 depiction of an open facing palm with splayed fingers. The hand in profile portrayal is also found at Arados on Duyrat's Group IV, Series 4-11. However, on the Series 2 coins of Karne no clumsiness, or ambiguity is observed in this depiction, whereas at the mints of Arados and many other eastern mints, there is an intermediate stage in the transition from the open facing palm hand to the hand in profile, reflecting a period where the die engravers struggled with the new depiction of the hand.²⁶ The absence of any intermediate form of hand on the reverse dies at Karne suggests that there was a time break between Series 1 and 2, so that the coins of Series 2 date to a period after the transition from the open facing palm depiction, by which stage the hand in profile was fully defined, a familiar form for the die engraver. This observation reinforces the dating inferred from the stylistic affinity of Series 2 with Duyrat Group IV, Series 4-11, the latter dated to 323-320 BC.

Cat. No. 8 (BM 2002,0101.785) introduces Series 2. It warrants clarification of this position in the sequence. This coin was attributed to Series 1 (Price 3429) in the collection of the British Museum and in Price's compendium.²⁷ The reverse of this coin was struck off-centre with the result that the exergue is off-flan. Yet a trace of the exergue, or ground line can be seen on the flan edge between the feet of the throne. A ground line is absent on Series 1, thus establishing the coin as an issue of Series 2. Moreover, the style of both the obverse (from die A3) and the reverse is distinctly that of Series 2, from the same engraver's hand as that responsible for the other dies of Series 2. This point

²⁶ Taylor 2018, 31-35 for details of the progression from an open facing palm hand to the hand in profile that is characteristic of coinage issued after 325 BC. The transition was not always smooth; for a brief period after its introduction die engravers appeared to grapple with the detail of the new depiction of the right hand of Zeus.

²⁷ Price 1991, 432 under Other References (Hersh) for type 3429.

is further reinforced by the depiction of Zeus's hand in profile, another characteristic of Series 2. The apparent absence of the royal title on this coin is due to the off-centre reverse strike, which placed the ΒΑΣΙΛΕΩΣ component of the legend completely off-metal. The placement of this coin at the head of Series 2 is based on the fact that the obverse style is not as fully developed as that of subsequent two obverse dies, measured against which the head of Herakles appears somewhat undersized. It has the hallmarks of the first die by an engraver newly engaged to produce the Series 2 dies.

The statistical coverage of obverse dies for the Series 2 coinage is good ($C_{est} = 0.93$). It is estimated that four obverse dies were employed to strike this series (Table 2). This estimate sits within a 95% confidence interval of 3-6 dies. The estimated four original obverse dies of Series 2 may have struck approximately 53 Attic talents of silver into about 80,000 tetradrachms; a thirty percent larger emission than that of Series 1 (Table 2).

Series 3

Series 3 (Cat. Nos. 22-29; Plate 3, 22-29) is represented in the catalogue by eight coins; six tetradrachms struck from two obverse and three reverse dies, accompanied by two drachms from a single die pair. The drachm denomination has not been documented previously. The obverse portrayal of the head of Herakles on the tetradrachm dies is heavily stylized, lacking realism, while the busy style of the reverse drops the dotted circumferential border of the two prior series. The obverse dies are the product of a single engraver.

Price distinguished between two varieties for this series, Price 3431 (ϡ beneath *diphros*) and Price 3432 (Ϡ beneath *diphros*). Yet only coins of the former type are identified in the catalogue. The specimen referenced by Price as his type 3432 is not present in the American Numismatic Society's (ANS) PELLA database, which includes the Karne coinage from major institutional collections. Described by Price as being determined from "ANS photo-file (ex H. Seyrig)," Price 3432 may be the result of a misreading of the Phoenician letter ϡ beneath the *diphros*. The example referred to as being in the "ANS photo-file (ex H. Seyrig)" may be that of a cast of the Paris specimen BnF 41796489 (Cat. No 23). This possibility is raised by the fact that Duyrat²⁸ identified an ANS photo-file example (her no. 36) to be a separate specimen to that of the identical coin held in the BnF (her catalogue entry 37).²⁹ Seyrig's outline of the year 35 coinage of the Aradian Peraia illustrates the specimen in question which has a clearly outlined ϡ mint control, but at no time did he reference a specimen bearing the Ϡ mint control.³⁰ The existence of the type described as Price 3432 is uncertain, if not doubtful.

28 Duyrat 2002, 38 no. 36 "New York, fichier ANS, 1944 100 70952 (H. Seyrig n° 193 12 XIV)."

29 Duyrat references her catalogue entry 38 with the comment «même revers, mais lettre Phénicienne sous le trône: *gimel* (Price M. J. , 1991, n° 3432) 38-ANS Photo file H. Seyrig.» No dies are identified by Duyrat for this coin. Her catalogue entry relies solely on Price's description. Thus, it is uncertain, if not doubtful.

30 Seyrig 1964, 12 and pl. II, b.

Series 3 is dated with Phoenician numerals to year 35 (225/4 BC) of an era based on the initial acquisition of autonomy by Arados in 360/59 BC, under whose influence Karne and its sister cities on the mainland (the Aradian Peraia) were subject. It is the only dated tetradrachm emission of Karne, struck one year after the start of a series of dated civic bronze issues during the period 226/5-185/4 BC (dated with the Aradian era years 34-75).³¹ It is accompanied by a previously undocumented drachm issue, with which it is associated by iconographic style, the presence of the ρ mint control beneath the *diphros*, plus the Phoenician date in the exergue. The Series 3 emission parallels that of the other principal cities of the Aradian Peraia, Arados (Price 3380), Gabala (Price 3433) and Marathos (Price 3453) each in a similar style, all dated in Phoenician to Aradian year 35, while bearing a Greek monogram abbreviation of the name of each member city in the left field. These year 35 dated issues are interpreted to be a co-ordinated regional emission, struck as a contribution from the cities of the Aradian Peraia to finance the invasion of Asia Minor by Seleukos III.³²

The small sample of Series 3 coinage affords a modest statistical coverage of 0.83 with respect to the tetradrachm obverse dies (Table 2). That is to say that any further addition to the corpus of Series 3 tetradrachms has a 17% probability (1-Cest) of deriving from an as yet unidentified obverse die. Unsurprisingly therefore, at least three obverse tetradrachm dies are estimated to have been employed for the emission, with an associated uncertainty range on this estimate of 2-7 dies at the 95% confidence level. The 95% confidence interval defines the range within which a new estimate of the original number of dies, based on a new sample, will fall 95% of the time. The estimated three originally commissioned obverse tetradrachm dies may have struck approximately 39 Attic talents of silver into about 60,000 tetradrachms with a weight of about 16.8 grams per coin, the prevailing weight standard of the time.

Concordance with prior study

This die study identifies an additional tetradrachm obverse die in each of Series 1-3 compared to that of Duyrat's catalogue and sequence (Table 3). Dies A1 and A2 of this study were misidentified as a single die (Carné Série I, D3) in the previous study. Most notably the analysis of the development of iconographic style in Series 1 and 2, including the progression of chronological pegs identified in the parallel developments observed at the mints of nearby Aardos, indicates the need for a reversal of the die sequence compared to that proposed by Duyrat in her Série I.

31 Price 1991, 416- 419, tables G & H.

32 Seyrig 1964, 12; Price 1991, 432; Houghton and Lorber 2002, 335-337.

Table 3. Concordance.

Legend	This Study		Duyrat (2002)	
ΑΛΕΞΑΝΔΡΟΥ	Series 1	A1	Carné Série I	D3
	Series 1	A2	Carné Série I	D3
ΒΑΣΙΛΕΩΣ ΑΛΕΞΑΝΔΡΟΥ	Series 2	A3	Carné Série I	-
	Series 2	A4	Carné Série I	D2
	Series 2	A5	Carné Série I	D1
ΑΛΕΞΑΝΔΡΟΥ	Series 3	A6	Carné Série IV	D1
	Series 3	A7	Carné Série IV	-
	Series 3	a1	-	-

Mint Marks

Series 1 and 2 bear the **Κ** mint mark (Fig. 2), a ligate Greek letter abbreviation that can be deconstructed into the first three letters (*kappa, alpha, rho*) of the city's name (KARne). This served to identify the mint of origin, a practice observed in the Phoenician and Syrian mints with the exception of Tyre, where the Phoenician letter abbreviation (*ayin, kaph*) of the vassal king's name Ozmillk³³ (Azemilkos in Greek) served to identify the city of origin. The **Κ** mint mark is unaccompanied by any form of secondary mint control. Among the Macedonian imperial mints of Phoenicia this control system, based on an invariable primary mint mark designating the city of origin, unaccompanied by any secondary mint controls, is unique to Karne and Arados II. On the autonomous Series 3 coinage of 225/4 BC the **Κ** monogram of Series 1 and 2 is expanded into two components **K** and **Α** defining the first three initials of the city name. The **Α** component is also the primary mint mark of the Macedonian imperial mint of Arados II from 327-300 BC,³⁴ subsequently to become the primary mint mark of the autonomous mint at Arados from 245 BC.³⁵ These mint control associations reinforce the interpretation, based on stylistic grounds, of a close affinity between the Karne issues and those of Arados. The singular invariant control on the coinage of Series 1 and 2 suggests that the mintage was undertaken under the same administrative construct as that of Arados II, positioning the coinage as the product of an imperial government agency, in contrast to Arados I, which was nominally under intermediary supervision of the vassal king, Gerastart (Gerostratos in Greek), during the lifetime of Alexander the Great.³⁶ Like the

33 Le Rider 2007, 125-134.

34 Taylor 2020 in press.

35 Price 1991, 426-429.

36 Mørkholm 1991, 47 "It is therefore hardly proper to make a distinction between 'imperial' mints and 'allied' mints, as Newell was inclined to do. The explanation is rather that, while the other mints were government agencies, the Phoenician and Cypriot city-states under their local kings retained the management of their mints, although they naturally had to operate within the general regulations laid down by the central administration."

other Phoenician mints under the intermediary direction of a vassal king, or satrap, the coinage of the Arados I bears a suite of secondary mint controls that attest to another level of control and reconciliation that is not apparent in the coinage of the government agency mint of Arados II, or Karne.



Figure 2. Monogram detail (Cat. No. 18).

Metrology

Table 4 summarises the weight distribution of the tetradrachms represented in the catalogue.

Table 4: Tetradrachm weights.

	No. of coins (n)	Mean (g)	Median (g)	Mode (g)	σ (g)
Series 1	7	17.03	17.22	17.22	0.31
Series 2	14	17.08	17.17	17.21	0.22
Series 3	5	15.86	15.86	-	1.05

Series 1 and 2 appear to have been struck to an intended weight standard of around 17.2 grams. This is consistent with the Attic weight standard that prevailed during the lifetime of Alexander the Great and shortly thereafter. Series 3 with only five recorded weights shows a significantly reduced mean and median weight of 15.86 grams with a notably wide dispersion in the recorded weights. The heaviest specimen weighs 17.02 grams, the lightest and most heavily worn example only 14.54 grams. The standard deviation of 1.05 grams in Series 3 is three times greater than that of Series 1 and 2. The sample size is insufficient for an accurate determination of the weight standard to which the emission was struck. However, the data is consistent with a poorly implemented weight adjustment to the tetradrachm weight standard of about 16.8 grams that prevailed in the mid 3rd century BC. This inference is borne out by the two lightly worn drachms in Series 3 each of which weigh 4.09 grams, yielding a scaled tetradrachm weight standard of 16.36 grams, which under usual mint practice would have been about 3% lower than the official tetradrachm weight standard.

Chronology

Price, following Newell, dated the Series 1 and 2 emissions to the period *c.* 328-320 BC.³⁷ The die study and comparative stylistic analysis with the Alexanders of Arados enable some refinement within this range (Table 5).³⁸

Table 5. Karne Series 1 and 2: Chronology based on Arados Mints

Duyrat (2005) Arados I	Taylor (in press) Arados II	Karne
<i>c.</i> 332- <i>c.</i> 324 BC		
Group I	<i>c.</i> 327/6-326/5 BC Series 1 & 2 (AV staters)	
Group II	First half of Series 3 <i>c.</i> 326/5- 3 325/4 BC	Series 1
Group III <i>c.</i> 324- <i>c.</i> 320 BC	Second half of Series 3 <i>c.</i> 325/4-321/0 BC	
Group IV	First Half of Series 4	Series 2
<i>after</i> 320 BC	<i>after</i> 321/0 BC	
Mint closed*	Second half of Series 4	

*Duyrat Groups V and VI reattributed to Babylon II by Houghton and Lorber (2002)

Based on the affinity of the style of Series 1 with the earliest issues of Arados II and that of Series 2 with the later emission from Arados I, the chronology of each can be narrowed to a brief period. Series 1 dates to *c.* 327/6 BC, while Series 2 falls within the period *c.* 323-320 BC. This proposed chronology is consistent with the presence of coins (Cat. Nos. 2 and 12) from each of Series I and 2 in the Demanhur Hoard (IGCH 1664) that closed in 318 BC.³⁹ Series 3, marked year 35 of the Aradian autonomous era that commenced in 259/8 BC, carries no uncertainty as to its date of issue in 225/4 BC, part of a co-ordinated regional emission, struck as a contribution from the cities of the Aradian Peraia to help finance the invasion of Asia Minor by Seleukos III.

The reason for two small emissions, one in *c.* 327/6 BC (Series 1) and another at some time in the interval *c.* 323-320 BC (Series 2) is unknown. No military events or campaigns are attested to in the immediate region at the time, and in any event the coinage was too small to sustain a sizeable military campaign. However, Karne as the sole mainland port on the northern Phoenician coast, and the arsenal of Arados, occupied a strategic

37 Price 1991, 432; Newell 1923, 117-119.

38 Duyrat 2005, 13 for the dating of the Arados I emissions and Taylor (in press) for the dating of the Arados II (Byblos of Price) Alexanders.

39 Newell 1912 plus Newell 1923, and coinhoards.org/id/igch1664 accessed 22 October 2018. The Demanhur Hoard is the only documented find to include Series 1-2 Alexandrine tetradrachms of Karne.

location. As a result, it is likely to have been the location of a Macedonian garrison to ensure the security of the port city. It is conceivable that accumulated silver and/or coinage from port receipts and taxes was struck into Macedonian imperial coinage periodically in order to sustain the garrison. This might also explain the presence of coins from these small emissions in the Demanhur Hoard, for the port would have hosted trading and military vessels travelling to Egypt along the Phoenician coast, affording the means by which some of this small volume coinage circulated far to the south. Notably, the Demanhur hoard (*IGCH* 1664) is the only documented hoard to contain Alexanders struck at Karne.

However, an alternative possible explanation for Series 2 is to be found in the historical record. At the assembly of the Macedonian armies at Triparadeisos to acclaim a new leader in 321/0 BC the royal army threatened the life of the Macedonian viceroy, Antipater, over his inability to make good immediately the arrears in pay arising from the abortive campaign of the regent, Perdikkas, to retake Egypt.⁴⁰ Following the assembly, Antigonos in the capacity of *strategos* of Asia, took control of the royal army, leading it into Asia Minor via northern Phoenicia. Arados and Karne were on this route, the former being the only permanent minting city in northern Phoenicia. It is possible that as a matter of priority Antigonos ordered the mintage of available bullion at Arados and Karne to pay the army and secure its loyalty. At this time, we see a greatly increased die count in the final Macedonian Imperial emission at Arados I (Duyrat Group IV, Series 11; Price 3332) that was struck from 89 tetradrachm obverse dies.⁴¹ This final issue accounts for 45% of the tetradrachm obverse dies used at Arados I from its inception, marking it as the largest issue from the mint. It is possible that the Karne Series 2 emission was associated with this frenetic minting activity that was a precursor to the closure of the Arados I mint in 320 BC, as Antigonos asserted his influence and control over the scattered Macedonian mints and treasuries in the east.

The earliest ferrous Alexander tetradrachm die (A5)

A notable aspect of Series 2 to emerge from the detail of the die study is the development of die rust on an obverse die A5 (Fig. 3). This die struck all but three examples in the catalogue of Series 2, and 60 percent of the total sample of Series 1 and 2. Paired to twice as many reverse dies as the next most frequently paired obverse die, indications are that it was unusually productive and thus long-lived. Die rust developed progressively from the first use of A5 and is indicative of the use of ferrous material (iron or steel) in the manufacture of the die. In the maritime environment of Karne die rust would have developed rapidly on ferrous dies. It contrasts with the preceding dies of Series 1 and 2 on which die rust is absent, an indicator of the bronze composition of these earlier dies.

⁴⁰ Billows 1990, 68-70; Grainger 1990, 25-26.

⁴¹ Duyrat 2005, 24-30.

In the author's experience, A5 is the earliest identified example of a ferrous die used in the striking of Alexander tetradrachms.⁴²

The first documented use of ferrous dies in the Alexander series occurred with the gold staters of Arados II, commencing c. 328/7 BC, although the use of ferrous dies in the larger diameter tetradrachm coinage of the mint is not known.⁴³ Recent study suggests that the Arados II mint pioneered the use of ferrous dies for Macedonian imperial gold coinage.⁴⁴ Initially, the identification of what may be the first ferrous Alexander series tetradrachm die at Karne appears improbable, given the mint's limited history of operation and the relatively negligible size of the coinage. However, the recognition of earlier ferrous die use at nearby Arados II, albeit for smaller diameter gold stater dies, resolves the apparent incongruity. In a trial, a larger diameter ferrous tetradrachm die may have been prepared at the major mint facility at nearby Arados for use in the Karne mintage. A ferrous obverse die would have the advantage of a longer life, being stronger and less wear prone than bronze. This may have sufficiently offset the manufacturing difficulties, including more difficult cutting/engraving, to warrant ferrous die usage for a short duration emission, struck in a remote location from the primary Aradian mint facility. Certainly, the identification of A5 as a ferrous die serves to further associate the location of the Series 2 mintage with the region of the Aradian hinterland, for until that time ferrous dies in the Alexander series are only identified in the earliest gold stater series from Arados, while the transfer of this technology and its application in the more broadly spread Alexander mints had yet to occur.



Figure 3. Development of die rust on A5 (Cat. Nos. 15, 18, 19 and 20).

42 Based on the author's die studies of the Alexander mints in Phoenicia, Syria, Babylon, and Susa, plus a detailed review of die studies of Alexander's western mints.

43 Taylor 2020 in press for a detailed analysis and discussion of the use of ferrous stater dies at Arados.

44 Rare, intermittent, and very limited use of ferrous dies is attested to by the presence of the effects of the die rust elsewhere on some of the classical era Greek coinages, but not on a sustained, or widespread basis. Most notable are the dekadrachms of Syracuse signed by Euainetos and Kimon, where the obverse die is almost always accompanied by die rust. At this time, the strength, wear resistance and longevity of ferrous metal for large obverse dies appears to have been considered sufficient to outweigh the greater difficulty encountered in engraving ferrous dies and the deleterious effects of the early development of die rust. In contrast, the short-lived reverse dies, which received the hammer blow, and were thus prone to early breakage, were for the most part cut in bronze.

Conclusion

The episodic, small volume nature of each of Series 1 and 2 is consistent with their issuance from Karne, notwithstanding the doubt expressed by Duyrat on the attribution of these Macedonian imperial issues. Newell and Price considered the distinctive Aradian style of Series 1 and 2 to be beyond doubt, localising the issuing location to somewhere in northern Phoenicia. Based on recent die studies, the affinity of Series 1 with the earliest issue of Arados II, and that of Series 2 with the later issue of Arados I is compelling. The noted affinities, plus the small maritime distance of 10 km that separated Arados and Karne, suggest a strong temporal and spatial relationship between the two. Moreover, the episodic nature and small volume of Series 1 and 2, together with absence of denominations other than the tetradrachm makes their attribution to another regional centre unlikely. They each have the characteristics of a short-lived coinage struck to meet a need for imperial tetradrachms to settle short-term obligations. The recognition of a ferrous tetradrachm die to strike Series 2 strengthens the association of the minting location with nearby Arados, for it was in this city that the first use of ferrous dies in Alexander's coinage occurred.

Supporting the Karne attribution is a Greek monogram **K** displayed on the left field of Series 1 and 2, deciphered by Newell as the first three letters of the city's name, superseded a century later by the **K A** rendering of city's ethnic on Series 3. The practice of identification of the issuing city with an abbreviation of the city's name is paralleled by all but one of the other contemporary Macedonian imperial mints in Phoenicia and Syria.⁴⁵ This practice continued a century later, with all the regionally co-ordinated issues from the cities of the Aradian Peraia dated to year 35 (225/4 BC).

The observed parallels in the development of style that occurred with the contemporary issues from the mints at Arados is best explained by the ephemeral mint at Karne drawing on the resources of the larger nearby mints at Arados. A die engraver may have been seconded from Arados to Karne for each of the brief periods of mintage of Series 1 and 2. Alternatively, purpose cut dies may have been engraved initially at Arados II for Series 1, followed some years later by engraving at Arados I for Series 2, with the dies then shipped the short distance to Karne for the mintage of each series.

Most definitely, the existence of an extensive contemporary coinage from nearby Arados did not preclude the episodic issuance of coinage from Karne in the period c. 327-320 BC. This is amply demonstrated by the fact that a century later Karne issued a similar coinage in support of the campaign of Seleukos III into Asia Minor,

45 The exception being Tyre the coinage of which carried the Phoenician abbreviation (letters *ayin, kaph*) of the name 'Ozmilk (Azemilkos in Greek) the Tyrian vassal king, accompanied by a regnal year date applicable to his era. Le Rider 2007, 125-134.

notwithstanding the regional influence and dominance of Arados. As Newell⁴⁶ noted we are left with no alternative to Karne as a viable option for the attribution of the 'Alexanders' solely bearing the **K** monogram and no other mintmark. However, on the weight of iconographic and stylistic evidence from Series 1-3, the utilisation of Aradian mint resources in the mintage of each series is likely, thus explaining the strong affinities noted in the die study.

Acknowledgements

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Author

Lloyd Taylor has a PhD in Geology and Geophysics from The University of Sydney. In retirement, he is independently researching the eastern mints of Alexander the Great and his immediate successors.

Bibliography

- Babelon, E. 1898, *Inventaire sommaire de la collection Waddington acquise par l'Etat en 1897 pour le département des médailles et antiques de la Bibliothèque nationale*. Paris: Rollin et Feuardent.
- Billows, R. A. 1990, *Antigonos the One-Eyed and the Creation of the Hellenistic State*. Berkeley: University of California Press.
- Callataÿ, F. de. 2011, Quantifying Monetary Production in Greco-Roman Times: A General Frame. In *Quantifying Monetary Supplies in Greco-Roman Times*, edited by F. de Callataÿ: 7-29. Pragmateiai 19. Bari: Edipuglia.
- Duyrat, F. 2002, Les ateliers monétaires de Phénicie du Nord à l'époque hellénistique. In Augé C. and F. Duyrat (eds.) *Les Monnayages Syriens. Quel apport pour l'histoire du Proche-Orient hellénistique et romain ? Actes de la table ronde de Damas, 10-*

46 Newell 1923, 117-119.

47 <http://numismatics.org/pella/> accessed 22 October 2018.

48 <https://opendatacommons.org/licenses/odbl/1.0/> accessed 22 October 2018.

- 12 novembre 1999. Beyrouth: Institut français d'archéologie du Proche-Orient: 21-69.
- Duyrat, F. 2005, *Arados hellénistique étude historique et monétaire*. Bibliothèque archéologique et historique 173. Beirut: Institut Français du Proche-Orient.
- Esty, W. W. 2006, How to Estimate the Original Number of Dies and the Coverage of a Sample. *Numismatic Chronicle* 166: 359-364.
- Esty, W. W. 2011, The Geometric Model for Estimating the Number of Dies. In *Quantifying Monetary Supplies in Greco-Roman Times*, edited by F. de Callatay: 43-58. *Pragmateiai* 19. Bari: Edipuglia, 2011.
- Grainger, J. D. 1990, *Seleukos Nikator. Constructing a Hellenistic Kingdom*. London: Routledge.
- Hill, G. F. 1910, *Catalogue of Coins in the British Museum: Catalogue of the Greek Coins of Phoenicia*. London: British Museum.
- Houghton, A. and C. Lorber, 2002, *Seleucid Coins A Comprehensive Catalogue. Part 1 Seleucus I to Antiochos III*. New York/Lancaster/London The American Numismatic Society in association with Classical Numismatic Group.
- Le Rider, G. 2007, *Alexander the Great: Coinage, Finances and Policy*. Translated by W. E. Higgins. Philadelphia: American Philosophical Society.
- Mørholm, O. 1991, *Early Hellenistic Coinage from the Accession of Alexander to the Peace of Apamea (336-186 B.C.)*, eds. P. Grierson and U. Westermark. Cambridge: Cambridge University Press.
- Newell, E. T. 1912, Reattribution of Certain Tetradrachms of Alexander the Great. *American Journal of Numismatics* 45/46: 5-62.
- Newell, E. T. 1923. *Alexander Hoards II Demanhur, 1905*. Numismatic Notes and Monographs No. 19. New York: American Numismatic Society.
- Price, M. J. 1991, *The Coinage in the Name of Alexander the Great and Philip Arrhidaeus*. London: British Museum/Swiss Numismatic Society.
- Rouvier, J. 1901, Numismatique des villes de la Phénicie [3]. *Journal International d'Archéologie Numismatique* 4: 35-66.
- Seyrig, H. 1964, Monnaies hellénistiques. XII. Questions Aradiennes. 1. Gabala. *Revue Numismatique*, Series 6, Vol. 6: 9-28.
- Taylor, L. W. H. 2018, The Earliest Alexander III Tetradrachm Coinage of Babylon: Iconographic Development and Chronology. *American Journal of Numismatics* Second Series 30: 1-44.
- Taylor, L. W. H. 2020 in press, On the Reattribution of some Byblos Alexanders to Arados II. Accepted for publication in *American Journal of Numismatics* Second Series 32.

Karne Alexanders Plate 1

Series 1



1



2



3



4



5



6



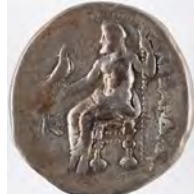
7



A
Arados II



B
Salamis



Karne Alexanders Plate 2

Series 2



8



9



10



11



12



13



14



15



16



17



18



19



20



21



C - Arados



Karne Alexanders Plate 3

Series 3



22



23



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27



Series 3 Drachms



28



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