Volume 28

Journal of the Numismatic Association of Australia

Numismatic Association of Australia Inc.

Address:	PO Box Z5211 Perth St Georges Terrace WA 6831 Australia	Website: http://www.numismatics.org.au Website manager: W R Bloom
Membership:	within Australia, $A25 p.a. or $A175 for 10 years overseas, $A30 p.a. or $A275 for 10 years	

ISSN: 0815-998X. The Journal of the Numismatic Association of Australia is a refereed annual publication. Views expressed by the authors in this journal are their own and do not necessarily reflect those of the editors or the NAA.

Digital preparation and layout by Openbook Howden Print & Design, St Marys, South Australia.

Front cover: Obverse die and medallion of West Australian Newspaper Award (see article "Royal Australian Institute of Architects - WA Chapter award medals")

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President's Report

Our seventh biennial international numismatic conference NAAC2017, which was held in Melbourne in October, was a great success. National Organiser Walter Bloom and the local Organizing Committee chaired by Darren Burgess put together an interesting program, one of the consequences of which was the marvellous selection of papers for this volume of the Journal.

This last year has seen the publication of Peter Lane's *The Coin Cabinet*, and the winning of the Paul Simon Memorial Award by Barrie Newman. Both Peter and Barrie are great contributors to the Association.

Our Vice-President, Darren Burgess, has advised that he won't be renominating at our coming AGM due to the pressure of work and the need to progress some NAV activities. I am grateful to Darren for all the work he puts into the NAA, in particular last year's biennial conference and the Facebook page, not to mention the steady stream of news items. In fact Darren is not completely off the hook as he has become the Victorian State Representative to the Association.

Stewart Wright of Status International has kindly offered us use of a room for the Association's AGM on Monday 16 April (commencing 1pm) at his new premises at 64 Parramatta Rd, Forest Lodge, close to the University of Sydney.

The NAA continues to enjoy sponsorship at a sustainable level, with Noble Numismatics (Gold), Coinworks, Downies (Silver), Drake Sterling, 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 are taking out ten-year memberships.

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 work in producing this Volume 28 of JNAA.

Walter R Bloom
President, NAA
www.numismatics.org.au
March 2017

Editor's Note

The 28th volume of the journal is a bumper issue and my eighth as Managing Editor. There are eleven articles reflecting a remarkable range of numismatic interests. I am particularly pleased to see the balance of modern Australian and historical numismatic interests, and the excellent scholarship throughout. Many of the articles derive from presentations given at the wonderful NAA conference held in Melbourne from 21-22 October, 2017. I thank the presenters for being willing to quickly turn their talks into articles, despite the hard work this entailed, as well as the dedication of the other contributors.

This journal is the annual publication of the peak numismatic body in the country. As noted in the last volume, I have been working with the President and the Editorial Committee to ensure the standard of all articles we publish compares favourably with the best international numismatic journals. This includes a rigorous double-blind peer-review process. I thank the members of the Editorial Committee (listed below) and the two anonymous reviewers assigned to each article for their prompt and constructive help.

I also wish to express my thanks to the two key people who work quietly and efficiently behind the scenes to help me get this journal out: John O'Connor (Nobles) who proof-reads the articles, and Barrie Newman (Adelaide Mint) who carefully looks after the production process.

In this volume we have six articles on modern Australian topics. The articles by Paul Holland and Walter bloom are numismatic studies respectively of George V pennies and award medals struck by the Royal Australian Institute of Architects, WA chapter. Their treatments are exemplary demonstrations of the 'arcane art' of numismatic studies combining detailed knowledge with keen observation. These are foundational studies for others to follow. Vincent Verheyen uses his expertise in chemistry to analyse surface marks on predecimal proof coins made at the Melbourne branch of the Royal Mint. He successfully demonstrates that some of the marks result from production rather than careless handling, a finding that will have implications for collectors of proofs generally. Jeremy McEachern, Barrie Newman and David Rampling show another side of numismatics – how it can be used to inform our understanding of the past. Their entertaining articles range from illuminating the story of one of Australia's earliest dealers (Rampling on Isidore Kozminsky), to the sporting achievements of one of the country's celebrated early athletes (McEachern on Richmond 'Dick' Eve and the collection of his memorabilia in the National Sports Museum), and even the sorry tale of an 'official' fraudster who nonetheless got away with his misdeeds (Newman on a Ugandan High Commissioner).

The volume also contains five articles on matters historical. Three of them deal with iconography and make fascinating reading, especially when taken together. Bridget McClean looks at Tarentine civic coinage c. 470–450 BC. Charlotte Mann and Rachel Mansfield both deal with iconography under emperors of the Severan dynasty of Rome in the early third century AD. Charlotte deals with the imperial portraiture of Caracalla, while Rachel examines the civic coinage of the eastern city of Antipatris under Elagabalus. The results of their studies are illuminating about how important coins were for disseminating propaganda, and in turn, understanding what was important to the emperors and cities that commissioned them. Christian Cuello takes us to the world of the Visigoths, best known for sacking Rome, but also producers of coinage, some of which reside in the Australian Centre for Ancient Numismatic Studies collection at Macquarie University, which he catalogues and discusses. Finally, Frank Robinson provides a careful study of bank notes of the Empire of Brazil which will be of interest to aficionados of paper money.

There is something for everyone in this volume.

Dr Gil Davis
Managing Editor

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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.

Die pairings, curved-base letters and dots: why are George V pennies so complex?

Paul M Holland

Abstract

Australian pennies of George V are surprisingly complex. For example, the Royal Mint in London inexplicably prepared five different master die types for 1911-1916 pennies, then later all of these die types were introduced into the Australian mints. Other aspects of George V pennies such as the phenomena of 'curved-base letters', unusual dot configurations on coins of 1919-1920 and overdating have perplexed collectors and numismatists over the years. These and other issues are addressed in this article.

Keywords

[George V] [predecimal pennies] [die varieties] [coinage dies] [Australian bronze coinage]

Introduction

For numismatists complexity is 'the spice of life' and this is something that Australian George V bronze pennies epitomize. Besides five different master die types originating at the Royal Mint in London and numerous pairings of these, additional layers of complexity arise in these coins. This includes derivative master dies produced at the Melbourne Mint in Australia in 1919 to meet urgent coining needs when the plans for a new nickel coinage were first delayed, then abruptly abandoned in 1920. These two years are perhaps the most complex for George V pennies and in this article, for the first time, technical details are elucidated regarding the mechanism that led to 'curved base letters' on many of these coins. Also addressed is the presence and sometimes perplexing use of tiny 'mintmark' dots on 1919 and 1920 pennies. Finally, the numerous die pairing varieties of 1920-1931 are discussed, along with some date spacing variations and the 1933/2 overdate. The coins themselves were struck at six different mints: London, Heaton, Calcutta, Melbourne, Sydney and Perth.

Shown in Figure 1 is a George V penny. The obverse was designed by Bertram Mackennal, the reverse by W. H. J. Blakemore. For technical details of the development of George V penny dies at the Royal Mint see JNAA volume 20.[1] It should be noted that the 1919

1 Holland 2010.

penny shown in Figure 1 is from dies that were 'cloned' at the Melboune Mint as an emergency measure when there was a shortage of dies from the Royal Mint in London.

Figure 1. George V penny from dies 'cloned' at the Melboune Mint.

A key framework for understanding the complexity of George V pennies is provided by the identification of different master die types and their pairings. The two obverse die types are the so-called English and Indian dies, or obverses 1 and 2. There are three different reverse die types, reverses A, B and C, sometimes referred to as the London, Birmingham, and Calcutta dies. That these five types are distinctly different obverse and reverse master die types is clearly demonstrated by the fact that they have differing numbers of border teeth, namely 177, 178, 174, 177 and 179, respectively.[2] Fortunately for numismatists, it is not necessary to count each border tooth to identify these types since the alignment of various letters in the legends with border teeth can be employed instead. For example, alignment of the final upright of the N of OMN with border teeth can be used to distinguish between obverses 1 and 2, and the three different reverse types can be identified by examining the relative positions of the letters ALIA of AUSTRALIA with border teeth as summarized in Figure 2. Furthermore, except for the year 1931, only a single reverse die type was used each year, and the two reverse types of 1931 show differences in the placement and orientation of the final date numeral that can be used to identify them.

2 Sharples 1992; Holland 1993.

Figure 2. Identifying features for the master die types of George V pennies including obverses 1 and 2, and reverses A, B and C, respectively, see text.

Development of George V Penny Dies

A structural overview showing the complexity of the master die types and their various die pairings is presented in Table 1. Dates for these coins are shown in the first column, known die pairings in the second, followed by a brief comment in the final column.

Table 1. Summary of master die types and die pairing of George V pennies.

Date	Die Pairings	Comments
1911	1 + A	
All 1912-15	1 + B	
All 1916-18	2 + C	Calcutta Mint only
1919	1 + B	Dot varieties exist
1920	2 + C 1 + C	Dot varieties exist
1921	2 + B 1 + B	Obv 1 are Melb Mint
1922	1 + B 2 + B	Obv 2 are Perth Mint
1923	1 + A	
1924	1 + A 2 + A	Obv 2 are Sydney Mint
1925-26	1 + A	
1927	1 + A 2 + A	
1928	1 + A	
1929	1 + A 2 + A	
1930	2 + A	1 + A reported
1931	1 + A 2 + A	Rev A has ‘dropped 1’
	1 + B 2 + B	
All 1932-36	1 + B	1933/2 overdate

In examining Table 1, a number of interesting observations and questions arise. For example, why did new master tools for a second penny reverse die type come to be fabricated in 1912 only a year after its introduction in 1911, and why were new master dies types introduced in 1916 for the Calcutta Mint? Also, these 2+C types for the Calcutta Mint then appear in Australia in 1920, and for twelve years various die pairings with both English and Indian die obverses are encountered.

The surprising change to a new reverse B master die type in 1912 appears to have arisen almost accidently. This occurred when problems (guttering) were encountered in hardening a punch taken from the original reverse A master die while producing a derivative master die dated 1912 for the Heaton Mint in Birmingham. The problem was addressed at the Royal Mint by the simple expedient of grinding off the defective beads and cleaning up the edge, and then using this punch to produce a new master die with the addition of 177 border beads in place of the 174 that were on the original version.[3] The new 'accidental' Birmingham reverse die type then became standard for all pennies from 1912-1915, as well as many of the other years that George V pennies were struck, including the final coinage years from 1932-1936.

Because of the potential hazards of sea transport due to submarines and surface raiders during the First World War, wartime production of bronze coinage for Australia was transferred to the mint in Calcutta. Of special numismatic interest, in March 1916 new penny master tools for both the obverse and reverse were produced for this purpose. The reverse master die included a small letter 'I' mintmark for India, and was made using a punch (hub) with the 'beads ground away', then re-beaded with 179 border teeth. The new penny obverse type for India made 'to suit the new reverse' was beaded with 178 versus 177 border teeth.[4] Why distinctive new master tools with different numbers of border teeth were produced for these pennies and not for the corresponding halfpennies is unknown, but the new 2+C types introduced for Australian pennies struck in India later played a pivotal role in die pairings of George V pennies, especially in the case of the obverse.

By the end of World War I all five different master die types for George V bronze pennies were thus in place. However, it was the disruption caused by abortive plans to replace Australian bronze pennies and halfpennies with smaller nickel coins in 1919-1920, coupled with the urgent need to maintain a supply of bronze coins in the meantime that had the greatest impact on the numismatic complexity of George V pennies. This included die shortages that forced the Melbourne Mint to 'clone' penny dies as a stop-gap measure. Australian bronze pennies of 1919-1920 are further complicated by tiny hand-punched dots that appear in various positions. While the precise meaning and context of these

3 Holland 2010, 47-48.

4 Holland 2010, 49-50.

dots has been obscure, they are clearly deliberate markings and have sometimes been interpreted as 'mintmarks' although the Commonwealth Treasury specifically rejected having mintmarks on Australian coins beginning in 1919. The decision itself was unusual since 'M' had been used on all silver coins struck in Melbourne from 1916-1918.

The author has been working on various aspects of the complex problems presented by 1919-1920 pennies for more than fifteen years, aided by a reference collection of over 1,250 coins of these two years. This has allowed numismatic study down to the level of individual working dies using 'die markers' such as date numeral spacing/orientation, dot positions, flaws, die cracks, etc. However, going into such detail is beyond the scope of the present article and so only a few summary observations will be made here.

Also, during a recent October 2017 visit to the Public Records Office in Melbourne, I found additional documentary evidence that sheds light on the situation in 1919-1920. These documents begin with a February 19, 1919 letter from the Commonweath Treasury to the Melbourne Mint explaining that due to 'the difficulty of obtaining prompt supplies of bronze coin from Calcutta…the importation of dies sufficient to coin £10,000 of pence and £5,000 of halfpence in bronze coins' had been approved, and that Melbourne should 'undertake to cable for the dies from London or Calcutta as may be deemed expedient.'[5] In other words, it was a lack of reliable and prompt supply of bronze coins from Calcutta that triggered moving coining operations for bronze to Australia, and the Treasury didn't care whether the dies came from either London or Calcutta. It might be noted that the mintage of 1918-I bronze pennies from Calcutta was only 20% of that for 1917, and 25% for the corresponding halfpennies.

After contacting London about dies, a terse 21-word cable from Royal Mint in London to Melbourne followed on February 23rd stating 'six pairs penny dies about fortnight why not mint mark as on silver is not local coinage other Australian mints possible'.[6] This was followed by a letter from London to Melbourne on the 27th that confirmed plans to supply six pairs of penny dies, with nine more to follow. That the subject of mintmarks had been brought up in the cable made sense, as all previous Australian Commonwealth coinage except that struck at the Royal Mint itself, had distintive mintmarks including 'H' for Heaton in Birmingham, 'I' for Calcutta and 'M' for silver coins struck in Melbourne. Nonetheless, the letter also confirms that 'all will be unmarked in accordance with the wishes of the Commonwealth Government'. It goes on to suggest that Melbourne consider adding equipment to begin producing their own dies for both silver and bronze coinage, since the combined number of dies required would severely tax the ability of the Royal Mint's Die Department to provide them.[7]

5 Victoria Public Records Office (VPRO).
6 VPRO.
7 VPRO.

Communications by letter were very slow in the days before airmail, and Melbourne's response to London came in a letter dated May 8th stating that while it had been more economical to obtain the dies for coining silver from London, they were now considering substituting nickel for coining pence and halfpence, and making the dies locally in an 'altered shape and design'. The Melbourne Mint further acknowledged that it 'had no experience in the manufacture of dies' and requested information on this subject from the Royal Mint.[8]

The Royal Mint responded with detailed instructions on the fabrication of dies in a letter of 17 July 1919. This is reproduced in JNAA volume 6.[9] It should be recalled that the original order from the Commonwealth Treasury for 1919 bronze pence had begun 'Pending the introduction of nickel coins...' while plans were underway to produce dies for the new nickel coinage at the Melbourne Mint itself.[10] The confusion between these competing schemes caused delays, and the first batch of 1+B dies for coining 1919 bronze pennies was not received until May, with the first coins from these not struck until June. While two further batches of dies for bronze pennies were received, the plans for switching to smaller nickel coins in 1919 continued to be delayed, until it became too late in the year to order additional 1919 penny dies from London.[11]

This forced the Melbourne Mint to 'clone' the additional 1+B working dies that were needed for 1919 bronze pennies from dies supplied by London as a stop-gap measure. The procedure would be to use a working die supplied by London to produce 'derivative' hubs (or punches), then use these locally produced hubs to produce 'cloned' working dies. The inexperience of the Melbourne Mint at producing both hubs and dies coupled with the fact that the final dies were several stages further removed from the original master dies created in London, led to cloned dies that exhibit observable distortions such as 'curved base letters', especially on the reverse. Such pennies with 'curved base letters' versus 'flat base letters' on their reverses have long been noted,[12] but details as to how they originated was unresolved. In 1993, the author stated that these variations were 'so pronounced and prevalent that it seems likely that they arose during some earlier stage in die production (i.e. at the levels of the hubs used to prepare working dies or from derivative master dies)'.[13]

The author now believes that technical details as to how curved-base letters arose on these coins can be elucidated for the first time. I've concluded that curved-base letters almost certainly arose from 'fish tailing' of the bases of the lettering that occurred

8 VPRO.
9 Sharples 1992, 25-27.
10 Sharples 1985, 6.
11 Sharples 1985, 7.
12 Dean 1964, 37-45.
13 Holland 1993, 16.

during the production of cloned 'derivative' hubs (or punches). This effect is created by unconstrained 'channeled flow' of the annealed (softened) die steel when striking the hubs. From a hydrodynamic point of view, such flow, especially in the uprights of lettering with serifed bases can produce a low pressure eddy in its wake resulting in a 'hollow' at the base of the letter. It might be noted that the author is a scientist who has studied hydrodynamic flow of metals during hypervelocity impact.[14]

Curiously, a key to unlocking this puzzle came from experiments conducted at the Royal Mint on striking coins. These experiments were made using the *same* dies for striking coins under various conditions, and showed that lettering with square or flat bases 'at once developed fishtails and other distortions' in the absence of a constraining collar. This was especially noted on letters with vertical uprights 'as the upright tends to act as a channel and therefore encourages the flow of metal, leaving a hollow which gives the letter a fishtailed appearance'. Furthermore, it was found that such 'fish tailing occurs regardless of the metal used, the thickness of the blank, or the force of the blow'.[15] Extrapolating these findings to the production of a hub (or punch) where there is clearly no such constraining collar, inexperienced workers at the Melbourne Mint may have tried to 'rush' the process of producing new derivative hubs (punches) by not transferring the designs carefully enough using a series of well-controlled and measured blows with proper annealing of the steel forging between steps.

Close-up images comparing flat and curved base letters on the reverses of two 1919 pennies are shown in Figure 3 with flat-base letters on top, curved-base letters below. That this effect is the result of outward 'channeled flow' of metal from the serifed base of the lettering is supported by close comparison of some of the lettering on opposite sides of the coins, i.e. MON of COMMONWEALTH and LI of AUSTRALIA. In particular, note the letters M, N, L and I where there is a clear indentation that occurs directly below the uprights (indicated by the white arrows). Close study of the base of the L is especially instructive, as this clearly demonstrates that the effect occurs below the upright, supporting the 'channeled flow' mechanism. The lettering with broadly rounded features such as the O or where a serifed base is lacking (right side of N), does not show this effect. It should be pointed out that these are both nearly uncirculated coins from the author's collection, the one at the top being without dot, the lower one having a clear dot 'below the bottom scroll'.

14 Holland, et al. 1990.

15 Dyer and Gaspar 1980, 122.

Figure 3. Close-up of flat-base letters (top) and curved-base letters (bottom) of 1919 pennies.

This curved-base letter phenomenon makes it possible to distinguish 1919 pennies struck from reverse dies originally supplied by London having flat-base letters, versus those with curved-base letters produced after the cloning of punches for producing dies in Melbourne. It should be noted that there also appears to be more than one version of 1919 curved-base letter pennies, with some showing strongly curved-base letters (as in Figure 3), others less so, indicating that more than one derivative hub (or punch) for the reverse was prepared. Cloned obverse penny dies were also produced, although the occurance of strongly curved-base letters seems to be especially apparent on the larger serifed lettering on the reverse of the Australian penny.

John Dean also notes curved-base letter reverses for 1920 and many other years of George V pennies, including all 1924-1936 coins.[16] However, this effect is generally not as pronounced as that shown in Figure 3, suggesting gradual improvement in technique for producing hubs (punches) at the Melbourne Mint. Having examined many pennies over the years looking for curvature at the bases of the lettering on their reverses, it has sometimes seemed like a fruitless exercise. Nonetheless, such curvature (even if relatively modest) is real, likely due to varying degrees of the 'channeled flow' phenomenon elucidated earlier during the production of hubs at the Melbourne Mint. Further details regarding curved-base letters for 1919-1936 George V pennies is an especially complex topic and is beyond the scope of the present article.

16 Dean 1964, 37-45.

In 1920, it was again anticipated that the new nickel coinage would finally be introduced. However, this was not to be, and all plans for nickel coins were finally abandoned. By May 1920 when bronze dies were again urgently needed, the Royal Mint was heavily engaged in work on dies for the newly debased (0.500 silver) coins for Great Britain, and it was simply too late to order 1920 dated bronze penny dies from London. As a result, George V penny dies dated 1920 and a pair of punches were ordered via cable on 19 May from the Calcutta Mint instead.[17] On the 25th Calcutta replied 'cannot send finished dies' since coining press details were lacking, so the dies were provided unhardened.[18] It is likely that most 1920 flat-base letter pennies were struck from dies provided from Calcutta, which after machining to fit coining presses in Sydney and hardening, were sent there. Curved-base letter pennies dated 1920 were likely struck from dies produced in Melbourne based on tools provided by Calcutta. This resulted in the 2+C die types appearing in Australian mints for the first time.

Dots on 1919-1920 Pennies

Interpreting the dots on George V pennies of 1919-1920 offers another fascinating layer of complexity. These coins frequently exhibit tiny hand-punched dots in various positions and while the precise meaning and context of these dots is somewhat obscure, they are clearly deliberate markings and have sometimes been interpreted as being 'mintmarks'. That these are deliberate markings is supported by the observation that these dots often show a small 'moat' surrounding the dot due to displacement of metal when they were 'punched' onto the die (this will be illustrated later). In effect, this produces a small raised crater-like 'lip' on the die itself that can be removed either by 'resurfacing' the die, thereby requiring an extra production step, or by eventual wear as the die is used in striking coins. Observation suggests that no special effort was made by the Melbourne Mint to remove this feature. Fortunately, recent work on analyzing the origin of round raised dots due to rust pitting at the surface of dies helps show how dots due to rust pitting can be distinguished from dots deliberately added to the die.[19]

Perhaps the most striking observation about these dots is that unlike ordinary mintmarks there seems to have been no special effort to make them especially visible or durable as permanent markings. That is, they are typically small and easily obscured by wear or surface marking. To the author, this suggests the dots had a more transient utility as identifying markers for dies that was more for internal use by the mint than for the general public once the coins reached circulation. After all, the Commonwealth Treasury had made a specific decision that mintmarks were not to be used on Australian coins beginning in 1919.

17 VPRO.
18 VPRO.
19 Holland 2016.

An overview of the observed pattern of dots on 1919-1920 pennies shows the following variations: dot below the bottom scroll, dot above the bottom scroll, dot above the top scroll only, and double dots (with one dot below the bottom scroll and the other above the top scroll). Although tedious, it seems especially important to study the occurrence of these dots on coins down to the level of individual working dies. Such dies can be distinguished by small variations in the placement of the dot, die cracks, flaws or other features. For this, a stereo microscope and access to a large number of coins of each type is especially helpful. Fortunately, the author has a substantial reference collection of 1919-1920 pennies, enriched in important die varieties for this task. Results show that numerous working dies occur either with a dot below the bottom scroll or a dot above the bottom scroll. In the case of the other dot types, careful study shows that the 'dot above the top scroll only' type occurs on a single reverse working die, and that the 1919 and 1920 'double dot' varieties occur on a single reverse working die each.

Beginning with observations on pennies dated 1919, results show that a dot below the bottom scroll primarily appears on coins that can be identified as being from Melbourne 'cloned' dies with various versions of curved base letters. 'Flat-base letter' pennies, which are believed to have been struck from dies produced in London and exhibit a variety of different date numeral positions, typically do not have a dot. Deferring discussion about the 1919 double dot penny for now, the simplest explanation for 1919 pennies would seem to be that placing a 'dot below the bottom scroll' was used to mark the 'cloned' dies produced in Melbourne, whereas the already hardened dies supplied by the Royal Mint in London occur without dot. It should be pointed out that the dots on these coins are typically very small (0.2-0.3 mm), in relatively low relief and on circulated coins, these are often obscured by wear or surface marking. This sometimes makes categorizing pennies as being 'with or without dot' uncertain, and this has been the source of confusion among collectors over the years.

Moving on to dots on 1920 pennies and again deferring discussion of those types that occur with only a single working die, this leaves coins with a dot either below or above the bottom scroll, noting that 1920 pennies were struck at both the Melbourne and Sydney mints. Following from earlier results for 1919 pennies, a 'dot below the bottom scroll' on 1920 coins would clearly indicate reverse dies were produced at the Melbourne Mint. Inspection of more than one hundred and fifty examples of 'dot above bottom scroll' 1920 pennies show 'flat base letters' presumably from dies originally supplied by the Calcutta Mint. Fortunately there is direct evidence to support this, including a contemporary description by Dr. Arthur Andrews that the dot above bottom scroll type was struck at the Sydney Mint and from mint records showing that the dies supplied from Calcutta were sent to the Sydney Mint after being finished in Melbourne.[20] This

20 Sharples 1985, 9-10.

clearly indicates that 'dot above bottom scroll' pennies were struck in Sydney, effectively making this dot a mintmark of sorts.

The question about the role of dots on 1919-1920 pennies becomes one of intent. Perhaps the primary reason for the persistent belief that some of these dots should be interpreted as mintmarks, is the much later and deliberate use of dots as mintmarks on Perth Mint coins beginning in the 1940s. My view is that the dots on 1919-1920 were strictly intended to denote the origin of the dies and were not intended as the mintmarks so clearly opposed by the Treasury. This explanation also conveniently and logically accounts for the absence of dots on George V pennies from 1921-1936, when the Melbourne Mint produced all the dies and such dots would no longer serve any useful purpose.

Guided by the principle of Occam's razor, that the simplest explanation that can account for the facts is to be preferred, deferred discussion of 1919-1920 dot pennies from single working dies can now be addressed. In other words, what is the origin and intent of the dots on both 'dot above the top scroll only' and 'double dot' coins? That these dots were deliberately punched into the dies for these coins seems quite certain, as the close-up images show the presence of 'moats' around dots caused by displaced metal.

Beginning with the 'the dot above the top scroll only' penny, what could be the possible purpose of placing a dot in this position? This unusual dot configuration was first published by John Sharples in 1985,[21] and he showed me an example during my visit to Museum Victoria in July 1994. This upper dot is only weakly struck, suggesting why this type was missed in John Dean's book and why it took so long to identify. That the dot clearly shows a 'moat' around it demonstrates that it was deliberately punched into the die, and is not an accidental raised dot due to rust formation on the die. The first time I was able to examine multiples of this variety was in July 2004, when Mark Bird showed me a number of examples while I was visiting M. R. Roberts shop. He pointed out that these all displayed the identical dot position, with some also showing a faint flaw after the base of the final A of AUSTRALIA.[22] It was immediately clear that these were all from a single pair of working dies. The two examples in my reference collection both exhibit the faint 'flaw after A' (to the right, just above the base) as shown in Figure 4. Careful numismatic study shows that there is otherwise nothing special about this particular reverse working die apart from the position of the dot. A more extensive survey of twenty of these coins by Neal Effendi show that fewer than half have the flaw after the A, but all display the identical dot.[23] Since it makes no sense to me that this penny variety should have a unique marking, the most plausible explanation for this

21 Sharples 1985, 10.
22 Bird 2004.
23 Effendi and Lever 2014.

'dot over top scroll' type seems to be that it simply resulted from an error in punching the dot onto a single reverse working die. To a mint worker, the face of the die itself would show 'backwards' lettering and the possibility of it being accidently inverted when it was intended that a dot be punched below the bottom scroll of the die can be readily envisioned. This interpretation seems especially plausible in view of the overall 'top to bottom' symmetry of the reverse design of the penny, where it is (reversed) lettering that provides the primary clue for discerning which side is the top of a die.

Figure 4. Details of 1920 'Dot Over Top Scroll Only' penny and (on right) faint flaw after A

The 1919 and 1920 'double dot' coins are more problematic, although both have long been known.[24] Again, careful examination of these two coins reveals nothing special about the dies, although they can be classified as 'curved-base letters' and 'flat-base letters', respectively. Close-up details of their upper and lower dots, along with characteristic die flaws for the working dies of these two coins are shown in Figure 5. It might be pointed out that some ten examples of the 1919 double dot and thirty seven of the 1920 double dot pennies were available for close study in my reference collection, but it is difficult to come up with a plausible explanation as to why these coins would have been deliberately marked with two dots. Note the faint die marker flaws above A to left and over W. (Fig. 5A)

24 Dean 1964, 39.

Figure 5. Details of 1919 double dot (left) and 1920 double dot (right) pennies, see text.

Figure 5A. Die marker flaws above A (left) and over W (right).

The two dots on the 1919 coin are atypical, with the upper dot being ovoid (4.5 by 3 mm) in a noticible depression, and the lower one is about 4 mm, larger than those on most other 1919-1920 pennies. To the author, it seems possible that they occurred when the first dot was mistakenly double punched (accounting for its ovoid appearance) above the top scroll (as for the 'top over top scroll only' type), but the error was noticed and then belatedly corrected by punching a second dot in the correct position. In any case, it seems nearly certain that the 'curved-based letters' 1919 double dot penny was struck in Melbourne, perhaps quite late as this distinctive type was first reported at the September 1920 meeting of the Numismatic Society of Victoria.[25] However, without mint records or other contemporary information on this, we will probably never know for sure. The 1920 double dot penny appears to lack contemporary documentation, although it has been widely known since John Dean's book.[26] On this flat-base letters coin, the small lower dot is weakly struck, sometimes leading to it being mistakenly classified as the dot over top scroll variety.

To properly understand the dots on 1919-1920 pennies, it is also necessary to be able to explain the apparent *absence* of dots on 1920 pennies. That is, assuming the Melbourne Mint used dots to mark the origin of reverse dies, then it seems *all* 1920 pennies should have dots, either below or above the bottom scroll. In the opinion of the author, it is this situation that has been a major stumbling block in understanding the role of dots on these coins. Since many of these dots are small and often obscured by wear or surface marking, this has led collectors and cataloguers to assume that 1920 'no dot' pennies are very common, at least in lower grades. This is understandable, since even in my own reference collection of over six hundred 1920 pennies, nearly two hundred and fifty show no clear sign of a dot, and I should point out that these are generally better than average coins, with full rims and beading with most grading near fine or better.

It wasn't until I began investigating the working dies of 1920 English die pennies in detail a little over fifteen years ago that I gained clear insight on this problem. In particular, detailed study of thirty two 1+C pennies in my reference collection, indicated that based on die markers only two different obverse working dies and pairings were used for these coins. These obverse die markers include a raised horizontal line flaw through IND and an irregular 5 mm long raised vertical flaw near the back of the King's collar, as shown in the close-ups in Figure 6. While many coins from both obverse dies showed a clear dot or a least a trace of a dot below the bottom scroll on the reverse, others had no discernible dot, even when examined under a microscope. Recent published work confirms these earlier (unpublished) results with an even more extensive survey of 1920 English die pennies that included eighty three coins, all from these same

25 Sharples 1985, 10.
26 Dean 1964.

two working die pairings.[27] In other words, all such 1920 English die pennies clearly were originally 'dot below the bottom scroll' whether the dot can now be observed or not, in agreement with listings by Dean[28] and Sharples[29].

Figure 6. Die markers for 1920 English die pennies, see text.

Extrapolating these findings to other 1920 pennies would suggest that all were originally marked with a dot, or at least that the Melbourne Mint intended to mark them this way. This presumption would suggest that 1920 'no dot' pennies don't exist, were struck from working dies where the original dot was in low relief and had either been worn away or been polished from the die, or perhaps were struck from dies where the dot had been omitted by mistake. Certainly a few high-grade examples with no apparent dot are known, but such coins are quite rare. Resolution of this problem is likely to require painstaking analysis of higher grade 1920 pennies with no apparent dot down to the level of individual working dies, with special emphasis on finding very early die state examples, to preclude the possibility that die wear has removed traces of the dot.

After 1920 dots were no longer used as die markers on George V pennies, and any dots that do occur are likely due to the rust on the dies.[30] From this point on, it is master die pairing varieties that are of the greatest numismatic interest. These pairings include a number of scarce or rare varieties of Australian pennies including 'English' die pennies of 1920 and 1921, and 'Indian' die pennies of 1924, 1927 and 1931.

Die Pairings and Other Features of George V Pennies from 1921-1933

In December 1920, the Royal Mint produced a new 1921 dated reverse B penny master die and punches for Australia, restoring the reverse B for pennies. At the same time, obverse 2 tools from the Calcutta Mint remained in use resulting in nearly all 1921 pennies being of the 2+B type. However, in late September 1921 new obverse punches

27 Effendi and Lever 2014.
28 Dean 1964.
29 Sharples 1985.
30 Holland 2016.

were provided by the Royal Mint. This restored the obverse 1 type later in the year, and consequently a few 1921 dated pennies of the rare 1+B type were struck in Melbourne.

What is perhaps of the greatest interest in 1922 pennies is that the somewhat scarce obverse 2 pennies of this year were only struck at the Perth Mint, as first pointed out by Sharples.[31] Reverse B continued into 1922, but in this year some significant variations in the spacing of date numerals occurs. Most 1922 pennies, including all those known to have been struck at the Perth Mint, are from the standard, narrow date reverse hub (punch) supplied by London. However, at least one de-dated punch was also used, allowing experiments with other date configurations including the very widely spaced date shown in Figure 7 for comparson. Dean reports three different date variations[32] and the author knows of others, but this is beyond the scope of the present article.

Figure 7. Standard and wider spacings of 1922 pennies, see text.

Interestingly, the following year, the Royal Mint reverted to the original 1911 Reverse A design type for 1923 dated penny die tools. Why this occurred is revealed by Engraving Department records that show that the mint went back to the original master die created in 1910 in order to have a 'wider table' to work with than that on Reverse B.[33] This resulted in Reverse A tools being re-introduced, creating a situation where all five different George V penny die types were available at various times during the period from 1920 to 1931, thus enhancing the numismatic complexity of Australian pennies.

In 1924, both English and Indian obverse dies again appear on pennies, with the rare 2+A Indian die pairings all struck in Sydney.[34] All 1925 and 1926 pennies are of the 1+A type. However, in 1927 the Indian obverse die again appears on a few rare pennies. It is believed that this is due to leftover dies from the Sydney Mint after it closed in 1926. While some 1928 pennies exhibit a flawed number 8 in the date, all are 1+A die pairings. In 1929, a substantial number of Indian obverse dies were again produced at the Melbourne Mint, presumably from tools originally provided from Calcutta. Consequently, both obverse 1 and 2 pennies appear in 1929 in roughly equal quantities, all paired with reverse A.

31 Sharples 1985, 12.
32 Dean 1964, 40.
33 Holland 2010, 55.
34 Sharples 1985, 17.

The iconic 1930 penny, sometimes termed 'the king of Australian coins', is the key date of Australian Commonwealth coins. The 1930 proofs of record and virtually all circulation strikes of this very rare coin are the 2+A type, although a few obverse 1 coins have been reported. Much has been written on the 1930 penny, including articles in JNAA.[35, 36] Since I don't have an example of this coin, I will not add more here.

In 1931, two obverse and two reverse types were used for striking pennies, making this the most complex single year for George V die pairing varieties. For some reason the Melbourne Mint decided to revert to reverse B part way through the year, presumably using the master tools provided by the Royal Mint in 1921. This resulted in reverse B being used for all pennies of 1932-1936. Also, 1931 was the final year that the 'Indian' obverse 2 die appears, producing both 2+A and 2+B die pairings. I'm fortunate in having nice examples of each, and Figure 8 shows how the reverses of these coins can be distinguished by the placement of the final date numeral. Close-up images of minute die markers from rust (Fig. 8A) are also provided based on a survey of examples in my reference collection and observation of other coins. This clearly shows that both are from individual working dies. Indian obverse 'dropped 1' pennies are considered to be extremely rare. My interpretation of Mullett's summary of Melbourne Mint records[37] indicates mintages of nil thousands (i.e. less than one thousand) and 46,000, respectively, for these 1931 Indian die pennies.

Figure 8. Indian die 1931 penny details, 'dropped 1' on left, regular on right.

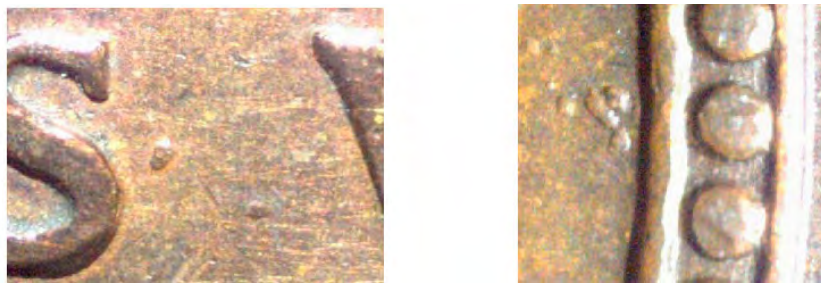

Figure 8A. Die markers from rust.

35 Sharples 1987.
36 Bloom 2010.
37 Mullett 1991.

A capstone illustrating the complexity of George V pennies is the 1933/2 overdate penny. This is highly unusual and is believed to be the only bronze overdate in 20th century British Commonwealth coinage. Detailed numismatic study of the overdate penny and correlation with information from mint records has revealed that it was the result of over-hubbing a batch of six dies in mid-December 1932. These die forgings had already received two blows from a 1932-dated hub and, after annealing, received the final blow from a new 1933-dated hub. An extreme close-up of the overdated numeral from one of these dies is shown in Figure 9. Based on correlation of mint records with a detailed survey of overdate sub-types, it was possible to determine that these coins were struck in March 1933.[38]

Figure 9. Overdate penny numeral showing 3/2, see text.

What is especially interesting about the overdate is that it clearly shows progression between the second and third blows as the design is transferred in producing the die. Here the upper portion of the underlying numeral 2 from the 1932-dated hub appears at the top (toward the centre of the die forging, not shown), and the overstruck 3 from the 1933-dated hub at the bottom (near the rim).

Conclusion

So why are Australian George V bronze pennies so complex? To begin with, the Royal Mint in London inexplicably prepared five different master die types for 1911-1916 coins. Then plans at the Melbourne Mint for switching to a smaller nickel coinage for Australia in 1919-1920 were first delayed, then abandoned. As a result, there were recurring shortages of dies for coining bronze pennies, requiring both the 'cloning' of dies in Melbourne, and the ordering of dies and die tools from the Calcutta Mint. Although the various 'cloned' dies were of the same master die types originally prepared

38 Holland 2002.

in London, during their production in Melbourne distortions of the lettering occurred, especially on the reverse, resulting in distinctive 'curved-base letters' on both dies and the resulting coins. This effect is now believed to have occurred due to channeled flow of annealed die steel when striking the hubs. Also, in 1919-1920 a system for marking dies with dots was introduced, apparently to indicate their source. A few pennies are marked with unusual dot configurations and these are now believed to have resulted from mistakes, either uncorrected or corrected, in punching dots onto the dies. Following the introduction of distinctive penny dies into Australia from the Calcutta Mint in 1920, a variety of different die type pairings can be observed from 1920-1931, with four types in 1931 alone. Finally, over-hubbing of a batch of dies in December 1932 led to various sub-types of 1933/2 overdate pennies.

As a result, Australian George V pennies offer a complex and fascinating topic for detailed numismatic study. At the same time these coins offer an affordable entry point for young collectors or those of modest means in circulated grades, but can be very challenging for the advanced collector and numismatist. Die pairings and other major varieties of George V pennies also provide a logical path for collectors to expand the scope of their existing predecimal bronze collections. As for myself, I have found this to be a nearly inexhaustable series for which many interesting numismatic problems remain.

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