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Numismatic Information from the Study of Coinage Errors

Paul M Holland

The most faithful numismatic information usually comes from direct study of the coins themselves. This is especially true in the case of dies used for coinage, since struck coins provide a detailed inverse image of each die used by the mint, including the number and placement of border beads, traces of deliberate mint alterations such as overdating, placement of date numerals and mintmarks, and accidental alterations to the die or mint tools. Such numismatically important features often go unrecorded in contemporary mint records. Furthermore, a detailed history of each die is produced as it sustains wear and damage up to the point where the die is removed from the coining press. This is reflected in a progression of clash marks, die cracks and finally cuds, where portions of the die itself break off. While numismatic studies can reveal a wealth of detail about coinage dies, information about other parts of the coining process are more elusive. The purpose of this short article is to show how some of this other information can be inferred from the study of coinage errors.

As collectors search for Australian pre-decimal bronze die varieties, unusual coins that result from striking errors are sure to be encountered. Among the most common but dramatic of these are Melbourne mint pennies of the late 1940s and early 1950s which exhibit 'strike-doubled dates',

examples of which are shown in Figure 1. These are often incorrectly described as coins with 'double-struck', 're-cut', 're-entered', or 're-engraved' dates and have been a source of confusion for collectors as well as cataloguers.

Inspection shows that no two examples are precisely alike and that they are the result of a process known variously as 'strike doubling', 'mechanical doubling damage' or 'machine-doubling'. This is believed to be caused by looseness in the die or coining press mechanism, which allows movement of the die while still in contact with the newly struck coin. Here, as pressure suddenly increases when the coin is struck, a twisting or other motion can be imparted to a loose die which causes it to drag across the face of the coin, producing the flat areas of damage that are characteristic of strike or mechanical doubling.¹ Because areas on the coin with sharp changes in relief are most affected, strike-doubling damage is especially noticeable at the date (a part of the coin which is almost always carefully examined by collectors). Usually only portions of a coin are affected; for example, several letters of the legend may exhibit strike-doubling but the date will not, or sometimes only a few of the date numerals may exhibit doubling. The close resemblance of coins with strike-doubling

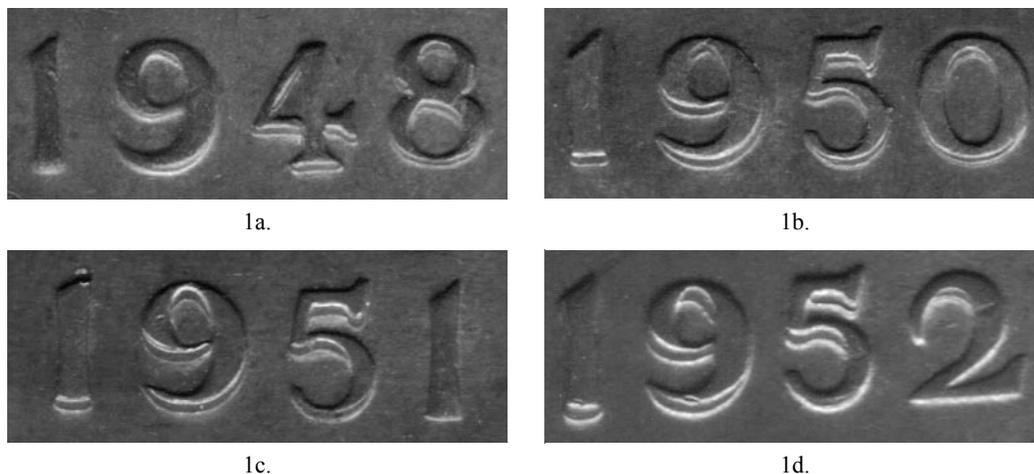


Figure 1. Four examples of strike-doubled dates on Melbourne mint pennies.

to coins made from doubled dies can be confusing for collectors. Generally, strike or machine doubling exhibits flat ledge or shelf like areas, whereas the features on doubled dies are typically more rounded and will often show both the doubling of portions of letters and the ‘splitting’ of serifs (due to misalignment when pressing the design into the die during manufacture).

Why strike-doubled dates are so prevalent on Melbourne mint pennies, but not those of the Perth mint, seems puzzling. Of the earliest catalogue listings, Dean² shows Melbourne mint pennies with ‘double struck or re-entered dates’ for 1948, 1950 and 1951, catalogue numbers P48A(a), P50A(a), P51B(a), respectively, along with the 1946 with ‘re-entered or double struck 4’, P46(b). Foster lists ‘double struck or re-cut dates’ for Melbourne mint pennies of 1948, 1949, 1950, 1951 and 1952 in the first edition of his book (P50, P51, P53, P56, P57).³ Clarke lists ‘recut dates or doubled struck’ pennies for Melbourne in

1951 and 1952.⁴ None are listed for Perth mint coins in these catalogues, although later editions of Foster do have listings for additional Melbourne dates, and for a few Perth mint coins. ‘Re-cut date’ varieties for various denominations are also discussed by Peter Wall in the *Australian Coin Review*, with special mention of the rarity of Perth mint coins.⁵

Survey results for 305 strike-doubled date Melbourne mint pennies from 1947-1953 are shown in Figure 2 as the dark bars. It should be pointed out that this is simply a raw count of the number of these coins observed in my reference collection, and is not a statistical sampling. Even so, the results show a pronounced upward trend for the years 1948 to 1952, with a very sharp reduction in 1953, dropping from 89 coins in 1952, to only four in 1953. If these results are compared to mintage figures⁶ using the same scale (in millions—light coloured bars) the years 1949-1952 show a substantial excess. Overall this suggests that strike or mechanical die doubling was

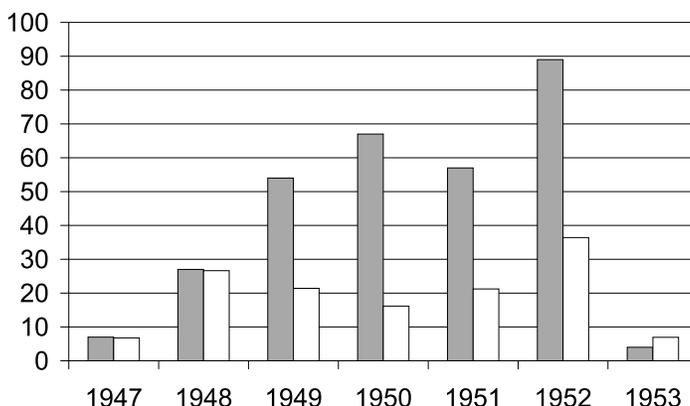


Figure 2. Distribution of 305 Melbourne mint pennies, with strike-doubled dates shown as dark bars, compared to mintage figures in millions shown as light bars.

probably recognised as a problem at the Melbourne mint in 1953 and that corrective steps were taken. However, without access to detailed Melbourne mint records for this period, precisely what occurred is unclear, although it seems likely that repairs or maintenance to the offending coining press (or presses) were made and improvements in the regular maintenance schedule were probably instituted.

Trying to understand why strike-doubled dates are so common on Melbourne mint pennies but not those of the Perth mint caused me to consider possible contributing factors such as differences in coining operations between the two mints. For this, differences in the placement of obverse and reverse dies in the coining presses might be especially relevant. Since detailed descriptions of the coining press setups at the two mints were unavailable, this led me to look to off-centre striking errors as a possible means of determining the orientation of dies in the coining presses.

Off-centre strikes occur when the coinage

blank is struck when not properly seated within the collar of the coining press. If a significant portion of the blank lies outside the collar it will only be partially struck, creating an off-centre error coin. Of special importance to the present investigation is that off-centre error coins also tend to be bent or ‘cupped’ when the blank is squeezed against an inner edge of the collar by the downward moving die. This feature can often reveal the orientation of dies. For example, if an off-centre coin is cupped toward the obverse, then clearly the obverse die was positioned in the coining press at the top and the reverse die fixed below. It should be noted, however, that not all off-centre coins show this cupping effect clearly enough to reveal an orientation.

Examples of pennies struck off-centre at the Melbourne and Perth mints respectively, are shown in Figure 3. These reveal that the reverse die was positioned in the coining press as the upper die for the 1949 Melbourne mint penny, while the obverse die was on top for the 1945 Perth mint



Figure 3. Off-centre error pennies. The cuppings indicate that the 1949 Melbourne mint penny had its reverse die uppermost in the coining press while the obverse die was on top for the 1945 Perth mint coin.

coin. Fortunately, it is now possible to independently confirm this orientation for Perth mint penny dies based on a radio script from 1945 that Anthea Harris has recently brought to light from Perth mint records.⁷ In the transcript, Mr HL Moore, the Foreman of Machinery, explains that

[t]he bottom die for the reverse side is a fixture and the obverse or head die is fixed in the moving head. As the blank is fed on to the bottom die the moving head comes down and stamps the piece, which as you see is held by a surrounding steel collar. So both impressions are given to the coin at the same time.⁷

The surprising observation of a reversal in die orientation between the two mints is reinforced by a survey of additional off-centre strike coins in my reference collection as shown in the Table below. Because of the limited number of coins available for this survey, the results were supplemented in one case by an auction photograph for a 1964 Perth mint penny where the die orientation was clearly

discernable.

Examination of the data in the Table suggests that at the Melbourne mint, the reverse penny die was *always* positioned as the upper die. Since the lower die is fixed in the coining press and only the upper die moves, looseness in the coining press mechanism at the Melbourne mint would primarily affect the reverse die and date side of the coin. The observed strong correlation of strike-doubling with the uppermost die in the coining press may help explain for the first time why strike-doubled dates are so common on Melbourne mint pennies when compared to those of the Perth mint.

The Table also suggests that the positions of the obverse and reverse penny dies in coining presses at the Perth mint apparently changed sometime in 1962. This would have resulted in the orientation of penny dies in coining presses being the same in both Melbourne and Perth. Although the reasons for this changeover are not known, it is possible that it may have coincided with two new coining presses coming into service in Perth in 1962 in addition

Date	Mint	Upper Die	Number of Coins
1942	Perth	Obv	2
1943	Perth	Obv	1
1944	Perth	Obv	4
1945	Perth	Obv	1
1947	Perth	Obv	1
1952	Perth	Obv	1
1953	Perth	Obv	1
1957	Perth	Obv	1
1959	Perth	Obv	1
1960	Perth	Obv	1
1961	Perth	Obv	3
1962	Perth	Obv	1
1962	Perth	Rev	1
1963	Perth	Rev	1
1964	Perth	Rev	1*
1947	Melbourne	Rev	1
1948	Melbourne	Rev	2
1949	Melbourne	Rev	3
1950	Melbourne	Rev	3
1951	Melbourne	Rev	1
1952	Melbourne	Rev	1
1964	Melbourne	Rev	5

Table. Cupping orientation of off-centre error pennies by date and mint, showing which die was uppermost in the coining press. * From auction image.

to the five already in use.¹ Here, Press number 7 began striking pennies on May 30, followed by Press number 6 on July 3. However, due to the very limited number of coins examined, it's also possible that the orientation may have differed only on the new presses.

By way of comparison, a few other available off-centre bronze coins with clear cupping orientation were examined. These included three off-centre 1943-I pennies struck in Bombay, all of which show the reverse to be the upper die as is the case for Melbourne. The several Perth mint halfpennies examined all show the obverse to be the upper die, including eight from the years 1945-51, together with a single example from 1963. No suitable off-centre halfpenny coins from Melbourne were

available.

The study of coinage errors offers an unusual approach for extracting numismatic information and may lead to new insights. In the present case, an examination of off-centre strike pennies has revealed an important and previously unrecorded difference in the placement of obverse and reverse dies in coining presses at the Melbourne and Perth mints. Furthermore, clear evidence of a link between strike-doubling damage and die placement is observed. This may help explain why strike-doubled dates are observed on Melbourne mint pennies.

As with many numismatic problems, new insights often lead to further questions and expose new areas for future research. Among these would be an expanded

investigation into the placement of dies in the coining presses used for striking the full range of denominations of Australian pre-decimal coinage. Since nine different mints could be included (London, Birmingham, San Francisco, Denver, Sydney, Melbourne, Perth, Calcutta, and Bombay) over a period of many years, this would require access to a much larger collection of off-centre strikes and would be a good project for a specialist collector of Australian error coins.

Acknowledgements

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The ABC radio transcript has been published as 'Radio Days' in *The Australasian Coin and Banknote Magazine*, vol. 6, no.10, Nov. 2003, pp. 44-5.

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