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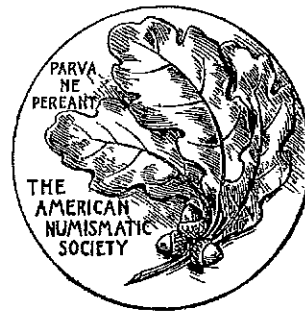# OF NUMISMATICS

16–17

Second Series, continuing

The American Numismatic Society Museum Notes

Street Money: Distribution and Analysis

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Money found in the street in West Lafayette, Indiana during a ten-year period from 1993 to 2003 was tabulated over twenty-one periods, yielding a total of 8331 units (5987 pennies, 653 nickels, 1178 dimes, 491 quarters, 1 half dollar, 17 dollar bills, 3 five-dollar bills, 1 ten-dollar bill). Distribution of coins over time was heterogeneous; regression analysis indicated a decrease in percentage of pennies and an increase in quarters and dimes, with nickels constant. In the last collection period, the mint dates of coins were determined and the mean coin age was 13.2 years. Street-found pennies represented a random selection of pennies, leaving circulation at a rate of –0.45% per year.

Anyone who has spent time in a modern American city will be familiar with the phenomenon of lost or discarded coins (most commonly pennies) found in the street, a phenomenon that is also strikingly familiar to archaeologists excavating ancient Greco-Roman cities. In recent years numismatists within the archaeological community have struggled to uncover the process and meaning of this type of coin deposition. During the course of the discussion, questions have been raised about whether such deposits represent accidental loss or the purposeful discard of coins that had become worthless for economic or social reasons (Butcher 2001–02). Likewise, there has been some debate over what these deposits may or may not be able to tell us about patterns of circulation and the state of the economy (Reece 1984: 173). The present paper attempts to answer similar questions

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regarding modern coin deposits, by statistically analyzing "street money" found in a section of West Lafayette, Indiana, over a ten-year period.

From 23 October 1993 to 25 December 2003, money found in the street by a group of dedicated walkers in West Lafayette was collected for a charity box. The discovery of coins was considered "good luck" so the coins were continuously sought, especially in places where they were most likely to be found, such as parking lots, soft drink dispensers, and other high-traffic areas on a 2-mile route that varied little from day to day. The route passed through a small commercial area called "The Village" consisting of shops, parking lots, and a small strip mall. When the box was considered full, the money was sorted by denomination and donated to a charity; over the ten-year period there were a total of twenty-one collections. At the last collection the dates of the coins were recorded and then compared to ten rolls of pennies (fifty each) obtained from a bank on 31 December 2003.

The distribution of street money by collection period is shown in Table 1. Over the ten-year period there was a total of 8331 finds consisting of 5987 pennies, 2323 cupro-nickel alloy coins (653 nickels, 1178 dimes, 491 quarters, and a single half-dollar), and 21 bills (17 dollars, 3 five-dollar bills, and a single ten-dollar bill). A summary of the total indicates the rarity of the half-dollar coin and the 10-dollar bill as street money, each less than 0.01% of finds as compared to 71.86% pennies. The total value of the money was $375.57, of which the greatest component was due to quarters ($122.75), followed by dimes ($117.80). Interestingly, the value of pennies ($59.87) was greater than the total value of bills ($47).

An analysis was made to determine if the distribution pattern of finds was constant over the twenty-one collection periods. Because the occurrence of the half-dollar and bills was so rare, this analysis was confined to pennies, nickels, dimes, and quarters. A chi-square test (Table 2) indicated that the distribution pattern of the twenty-one collections was inconsistent or heterogeneous ($\chi^2 = 197.0$, $P < 0.01$). To determine if this variation was affected by time, the data were plotted using the percentage distribution of each coin class against the mean date of each collection period. Regression was calculated for each of the four coin classes (Fig. 1). These results show a decrease in the percentage of pennies over time, with increasing quarters and dimes, while nickels remained constant. To better follow the changes within the cupro-nickel coin group, a regression analysis was made for the percentage distribution of the nickels, dimes, and quarters over the ten-year period (Fig. 2). There was clearly an increase in the percentage of quarters compensated by a decrease in dimes with nickels remaining fairly constant. Over time the percentage of quarters increased from about 13% of the cupro-nickel coin group to 31%, reflecting either a change in the actual frequency or merely a change in skill for assessing locations where quarters would be more likely to be found, since quarters are the coins of choice for dispensing machines.

TABLE 1. Collection dates, distribution, and value of street money collected over a ten-year period, West Lafayette, Indiana.

| | Collection time | | | Number found | | | | | | | |
| | | | | Coins | | | | | Bills | | |
Box	Start	Finish	Midpoint	1¢	5¢	10¢	25¢	50¢	$1	$5	$10
1	10/23/93	9/21/94	04/07/94	266	16	42	9				
2	09/22/94	01/25/95	11/01/94	291	31	42	16		1		
3	01/26/95	09/09/95	05/10/95	360	33	53	15			1	
4	09/10/95	12/31/95	11/02/95	198	13	29	12		2		
5	01/01/96	08/06/96	04/15/96	320	41	55	20	1	2	1	
6	08/07/96	10/25/96	09/11/96	200	19	25	6		1		
7	10/26/96	04/11/97	12/13/96	264	31	65	18		5		
8	04/12/97	11/23/97	06/01/97	338	40	62	19			1	
9	11/24/97	03/25/98	12/01/97	268	27	62	20				
10	03/26/98	11/04/98	05/27/98	380	32	74	23				
11	11/05/98	02/24/99	11/09/98	277	31	64	19		1		
12	02/25/99	06/18/99	03/20/99	256	45	56	25				
13	06/19/99	10/02/99	07/25/99	309	22	45	26				
14	10/03/99	03/05/00	12/02/99	348	32	80	32				
15	03/06/00	07/22/00	04/27/00	375	35	57	25		1		1
16	07/23/01	05/05/01	12/06/00	311	53	67	30				
17	05/06/01	11/29/01	08/22/01	321	30	57	24				
18	11/30/01	05/05/02	02/21/02	211	26	66	43		2		
19	05/06/02	11/10/02	08/13/02	245	25	46	33		2		
20	11/11/02	06/06/03	01/26/03	213	42	76	39				
21	06/07/03	12/25/03	09/21/03	236	29	55	37				
Total (grand total = 8331)				5987	653	1178	491	1	17	3	1
Distribution (%)				71.86	7.84	14.14	5.89	0.01	0.20	0.04	0.01
Value ($) (grand total = 375.57)				59.87	32.65	117.80	122.75	0.50	17.00	15.00	10.00

TABLE 2. Distribution of pennies, nickels, dimes, and quarters from 21 collection boxes over a ten-year period, $\chi^2 = 197.0$ (df = 60, $P < 0.01$).

	Number of coins								
	Penny		Nickel		Dime		Quarter		
Box	Found	Expected	Found	Expected	Found	Expected	Found	Expected	Total
1	266	240.0	16	26.2	42	47.2	9	19.7	333
2	291	273.8	31	29.9	42	53.9	16	22.4	380
3	360	332.2	33	36.2	53	65.4	15	27.2	461
4	198	181.6	13	19.8	29	35.7	12	14.9	252
5	320	314.2	41	34.3	55	61.8	20	25.8	436
6	200	180.1	19	19.6	25	35.4	6	14.8	250
7	264	272.4	31	29.7	65	53.6	18	22.3	378
8	338	330.7	40	36.1	62	65.1	19	27.1	459
9	268	271.6	27	29.6	62	53.4	20	22.3	377
10	380	366.8	32	40.0	74	72.1	23	30.1	509
11	277	281.7	31	30.7	64	55.4	19	23.1	391
12	256	275.2	45	30.0	56	54.2	25	22.6	382
13	309	289.7	22	31.6	45	57.0	26	23.8	402
14	348	354.5	32	38.7	80	69.8	32	29.1	492
15	375	354.5	35	38.7	57	69.8	25	29.1	492
16	311	332.2	53	36.2	67	65.4	30	27.2	461
17	321	311.3	30	34.0	57	61.2	24	25.5	432
18	211	249.3	26	27.2	66	49.0	43	20.4	346
19	245	251.5	25	27.4	46	49.5	33	20.6	349
20	213	266.6	42	29.1	76	52.4	39	21.9	370
21	236	257.2	29	28.0	55	50.6	37	21.1	357
Total	5987		653		1178		491		8309

At the end of the ten-year period, the dates of all coins in the last charity box were determined. In a very few cases the dates could not be read; street coins are notoriously defaced by traffic and the environment. For purposes of comparison ten rolls of bank pennies were used as a sample to represent the entire circulating penny population. In each of the ten rolls some new (2003) coins were found, confirming they were recently brought into the bank by customers. Thus, the data from the ten rolls were combined and presented in Table 3.

The mint dates of the 232 street pennies ranged from 1960 to 2003, with only four years missing; nickels ranged from 1959 to 2002, dimes from 1966 to 2003,
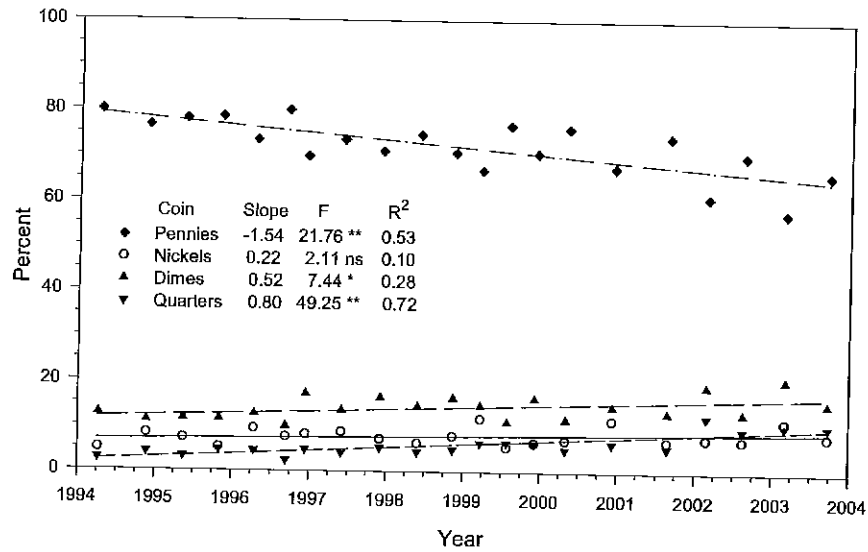
FIGURE 1. Regression of percent distribution of coins on collection date. Significance is indicated by * or ** ($P < 0.05$ or $P < 0.01$, respectively).
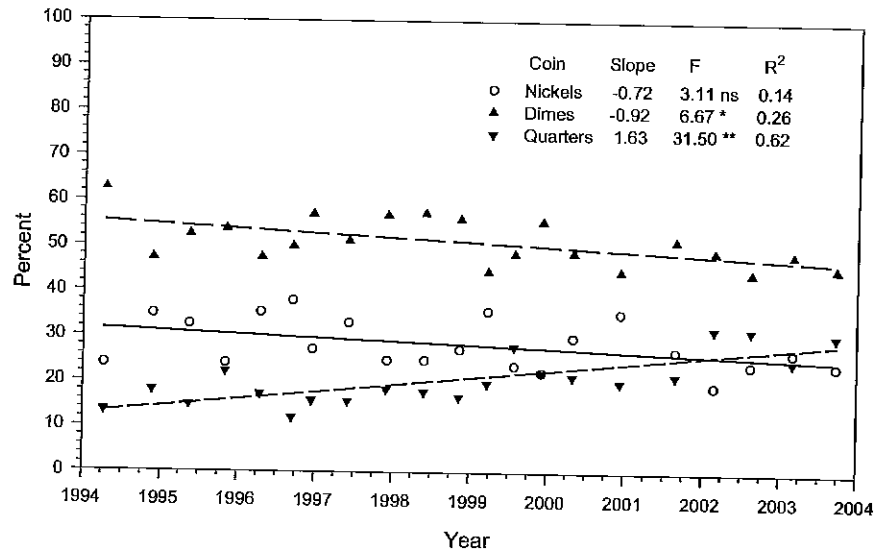

FIGURE 2. Regression of percent distribution of cupro-nickel coins on collection date. Significance is indicated by * or ** ($P < 0.05$ or $P < 0.01$, respectively).

TABLE 3. Distribution of mint year of bank pennies from ten rolls obtained 31 December 2003 and street coins collected 16 June to 25 December 2003.

Year	Bank Penny	No. of coins Street				
		Penny	Nickel	Dime	Quarter	Total
2003	27	26		1	3	30
2002	16	7	1	7	2	17
2001	21	6	2	4	1	13
2000	50	21	2	4	4	31
1999	16	8	2	3	1	14
1998	23	13	1	2	1	17
1997	11	10		4		14
1996	13	11	2	2		15
1995	19	11	3	4	2	20
1994	13	8	1	2	2	13
1993	17	5	1	1	2	9
1992	11	3		2	1	6
1991	17	2	1		2	5
1990	12	4	1	2	1	8
1989	11	2		1	1	4
1988	9	3	1	3		7
1987	7	5				5
1986	13	5				5
1985	9	3	1	1	2	7
1984	11	2	2	2	1	7
1983	15	8		1		9
1982	22	3			1	4
1981	14	14	1	1		16
1980	11	5		1	1	7
1979	9	4			3	7
1978	7	2				2
1977	7	2				2
1976	11	5				5
1975	6	4		1		5
1974	8	6	2	1	1	10

Year						
1973	5	7	1			8
1972	1	3				3
1971	4	1			1	2
1970	11			1		1
1969	11	3				3
1968	3	2		1		3
1967	3	1		2	2	5
1966	4	1		1	1	3
1965	2				2	2
1964	7	4	3			7
1963	2					0
1962	0	1				1
1961	1					0
1960	1	1				1
1959	1		1			1
1957	1					
1953	3					
1946	1					
1909	1					
Total	498	232	29	55	38	354
Mean coin age	14.8	13.1	15.4	11.1	14.7	13.2
Median mint year	1991	1994	1993	1995	1991	1994

and quarters from 1965 to 2003. The lack of pre-1965 dimes and quarters is explained by the fact that the mint ceased to use silver for these denominations in 1965, replacing it with a cupro-nickel alloy. Thus, the earlier issues were removed from circulation because their bullion value exceeded their face value. The median mint years were extremely close, ranging from 1991 for quarters to 1995 for dimes. The average age of street pennies was 13.1 years, as compared to 14.8 for the 498 bank pennies (two could not be read). The data confirmed the expected decay in frequency of appearance as coins age. These results indicate the average life of coins in circulation is about thirteen years.

An examination of the ages of both street and bank coins (Table 3) suggests that there may be differences in the amount of coins put into circulation annually, since the decline in frequency from year to year seems nonrandom (the plot is wavy). For example, in both street and bank pennies there seem to be peaks iu

TABLE 4. Distribution of coin age in five-year intervals from 2003 to 1909 in bank and street pennies, $\chi^2 = 14.9$, df = 9, n.s.

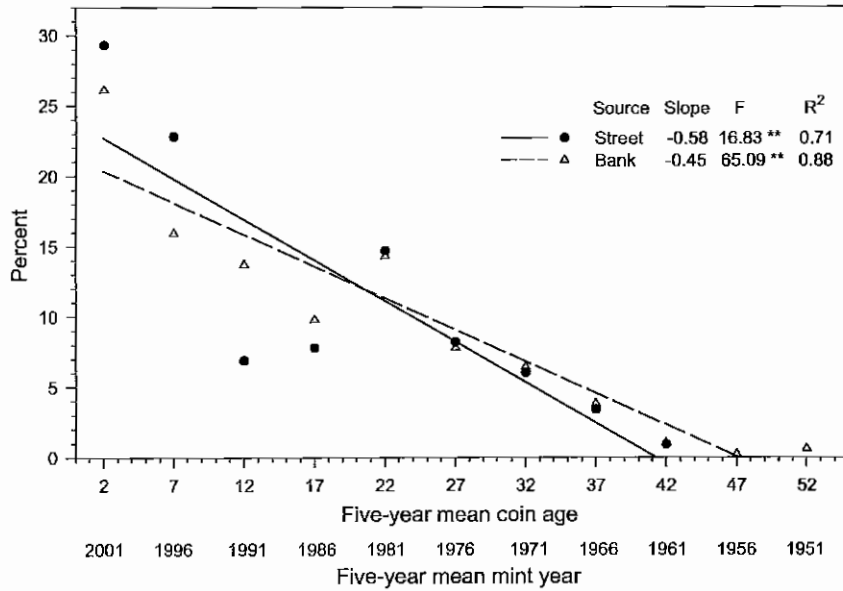| | Number of Coins | | | | |
| | Bank | | Street | | |
Median Year	Found	Expected	Found	Expected	Total
2001	130	135.1	68	62.9	198
1996	79	90.0	53	42.0	132
1991	68	57.3	16	26.7	84
1986	49	45.7	18	21.3	67
1981	71	71.6	34	33.4	105
1976	39	39.6	19	18.4	58
1971	32	31.4	14	14.6	46
1966	19	18.4	8	8.6	27
1961	5	4.8	2	2.2	7
1911–1956	6	4.1	0	1.9	6
Total	498		232		730

FIGURE 3. Regression of percent distribution of coins on age for street and bank penny collections, 2003. Significance is indicated by ** ($P < 0.01$).

2003, 2000, 1998, and 1995, a pattern that suggests an increased number of these pennies in the Lafayette area.

An analysis of the rate of decay over time for street and bank pennies was made by combining the coin data into five-year intervals, with 2003-minted coins having a coin age of 0, 2002 having an age of 1, and so on. Chi-square analysis (Table 4) indicated homogeneity of the data patterns. Regression of the percentage distribution on coin age (a more descriptive statistic) was performed to quantify the rates of decay (Fig. 3). Coins older than fifty years were considered extremely rare and were omitted from the regression. The rate of decay was linear for both street and bank pennies with no significant improvement of fit by considering the addition of a quadratic term. The rates of decay for street and bank pennies (−0.58% and −0.45%, respectively) are not different, with a combined rate of decay of −0.49% per year. It is interesting to note the greater percentage of street pennies in the 2001 and 1996 groups and the higher percentage of bank pennies in the 1991 and 1986 groups. Also, the 498 bank pennies contained a 1946 penny (57 years old) and a 1909 penny (94 years old!), while the oldest street penny was 1960 (43 years old). This may indicate that the group of bank pennies contained more hoarded coins.

What can be concluded from this ten-year study of coins found in the street? The age distribution suggests that the street pennies represent a random selection of coins in circulation. Clearly, pennies seem to be lost or discarded without reference to their age. Newly minted pennies (in this case 2003 dates) are easy to observe because of their sheen and luster; however, they were found disproportionately among street coins ($\chi^2 = 6.10$, $P < 0.05$, data not shown). Another obvious observation is that coins are carelessly handled by the American public. The high frequency of street pennies suggests that many individuals do not bother picking them up when dropped. However, in one case as many as twenty-seven were found in a single location, indicating that they were simply thrown away, a reflection of their low value and low esteem. The relative consistency of cupro-nickel coin finds might imply that all small change has become devalued in the mind of the American public. The early immigrants to this country were told that America was the land of opportunity with the streets paved in gold. They seem to have been right on both counts.

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