

SECTION III
ARCHAEOLOGY

SILVER COINS: EVIDENCE FOR MINING AT BAWZAING IN THE SHAN STATE CIRCA 6TH-8TH CENTURY A.D.

VIRGINIA M. DI CROCCO

CHULALONGKORN UNIVERSITY (RETIRED)

At the third Conference of the European Association of Southeast Asian Archaeologists held in 1990 this researcher suggested that the development of lead glazing on ceramics in Myanmar was associated with ancient mining at Bawzaing (20° 57" N 96° 50" E) near Heho in the Shan State, and further suggested the minting of silver coins from the silver content of the lead ore there by the Mon and Pyu Kingdoms.

The geologist H.L. Chhibber reported in 1934 that in the area of Bawzaing there are ore-bearing zones some hundreds of feet in width and extending for several miles north and south. These are easily located by the remains of ancient workings which penetrate them. He observed that the silver content of the lead at Bawzaing is very variable, ranging from 10 to 70 oz. to the ton of lead, while the ancient slags carry on the average upward to thirty percent lead but little silver. He deduced that this was due to the fact that the ancient workers extracted silver and had little use for the lead (Chhibber 1934: 148-9).

This deduction is only partially correct. The present paper indicates that while the workers did extract the silver, and used it at least in part to mint coins by circa the sixth to eighth centuries A.D., they began to use the "lead slag" to make ceramic glazes at an as yet undetermined time. They gathered chunks of "lead slag" which contained a bit of tin, ground them, melted them and made a glaze, adding whatever colorant they desired. To this day chunks of lead are carried to kilns in Twante, near Yangon, and Thayetkun, a suburb of Moulmein, for the manufacture of glazes. Analysis of what Chhibber called "lead slags" from Bawzaing by Mr. Yuichiro Kuno, Director of the Sambo Copper Alloy Company, Japan, has revealed that the "lead slags" are an intermediate product of lead smelting rather than "lead slags." Results of chemical analysis of two pieces of Bawzaing "lead slag" purchased for use in the kilns at Twante and Thayetkun give the following components:

Table 1

Twante		Thayetkun		
SiO ₂	38.70%	Si	0.60%	silicon
CaO	12.22	Ca	0.08	calcium
FeO	4.05	Fe	0.29	iron
ZnO	0.32	Zn	0.09	zinc
MgO	1.23	Mg	0.01	magnesium
Al ₂ O ₃	6.58	Al	0.10	aluminum
S	0.006	Pb	98.51	lead
Pb	28.17	Ag	0.086	silver
Ag	0.01	Cu	0.40	copper
Cu	0.33	As	0.02	arsenic
As	0.08	Sb	0.05	antimony
Sb	0.09	Sn	0.04	tin
Sn	0.25	Bi	0.01	bismuth
Bi	0.02	<u>Ti</u>	<u>0.01</u>	<u>Titanium</u>
O ₂	<u>35.7</u>	Sum	100.28%	
Sum	93.32%			

(Courtesy of Prof. Kazuo Yamasaki, 18 July 1992.) Lead isotope ratios of the two above-mentioned pieces of "lead slag" from Bawzaing were measured by Prof. H. Shirahata of the Muroran Institute of Technology, Hokkaido, as follows:

Table 2

	Pb 206/Pb 204	Pb 208/Pb 206	Pb 207/Pb 206
Twante	18.216±0.002	2.10509±0.00002	0.86144±0.00001
Thayetkun	18.260±0.005	2.10809±0.00007	0.86179±0.00003

The lead isotope ratios measured by Prof. Shirahata reveal that "lead slags" from Bawzaing have similar ratios to those of lead isotopes found on plaques of Mara's army at the Shwegugyi Pagoda, Bago (Pegu) area, white opaque glazed sherds from Bagan (Pagan), and white opaque glazed wares with green designs found in the Tak area of Thailand (Yamasaki *op. cit.* 18 July 1992 plus 20 August 1992; see also Yamasaki, Murozumi, Shaw and George 1989, 43-4).

Prof. Shirahata also analyzed the lead isotope ratios of three silver coins, reportedly found in Bago (Pegu) and Mattaya (north of Mandalay), Myanmar, and in Ratchaburi,

Thailand, to determine whether the lead samples in the coins agreed with the lead in the pieces of slag from Bawzaing employed in the making of glaze at Twante and Thayetkun and in the above-mentioned glazed wares from Bago, Bagan and Tak. The data in Table 3 indicate that the lead isotope ratios contained in the coins from Ratchaburi (No. 2) and from Mattaya (No. 3) agree well with those from the "lead slag" brought from Bawzaing. The lead in the coin from Bago is a little different but is still in the region of the opaque white wares with green patterns, etc. (Yamasaki 18 February 1992).

Table 3

	Pb 206/Pb 204	Pb 208/Pb 206	Pb 207/Pb 206
Coin 1 (Bago, the smallest)	18.212±0.0025	2.1095±0.00005	0.86144±0.00002
Coin 2 (Ratchaburi)	18.242±0.0008	2.10593±0.00002	0.86168±0.00001
Coin 3 (Mattaya)	18.256±0.0012	2.10786±0.00004	0.86177±0.00001

Coin No. 1 (Bago) has a worn but distinguishable *bhaddapitha* (throne) symbol on the obverse and a *srivatsa* (Skt., goddess of fortune) symbol on the reverse. Coins of this type have been found in the excavations at the Khinba Mound, Thayethkettaya (Sriksheetra), Beikthano and Halin (Hanlin), all Pyu cities in central Myanmar, and Prommatin and U Thong, Mon-Dvaravati sites in Thailand. Robert S. Wicks in his *Money, Markets and Trade in Early Southeast Asia* states that coins of this design are likely Pyu issues struck between the sixth and eighth centuries. Coin No. 2 (Ratchaburi) and No. 3 (Mattaya) have a symbol of the rising sun on the obverse and a *srivatsa* symbol on the reverse. Coins of the rising sun

type were the most widespread of all ancient coinage found in Southeast Asia. Specimens found in Myanmar have been ascribed to both the Pyus and the Mons, in Thailand to the Mon-Dvaravati, and in Vietnam to Funan. In his study mentioned above Wicks concludes that the rising sun coins originated in Myanmar.

The present paper gives evidence that coins with the *bhaddhapitha* and *srivatsa* symbols certainly were struck from silver mined at Bawzaing and that those mines were in operation circa the sixth-eighth century A.D., and that coins with the rising sun and *srivatsa* symbols were made of silver from the Bawzaing mines as well.

Coin No. 1, Bago (Pegu), Myanmar
diameter c. 18 mm.

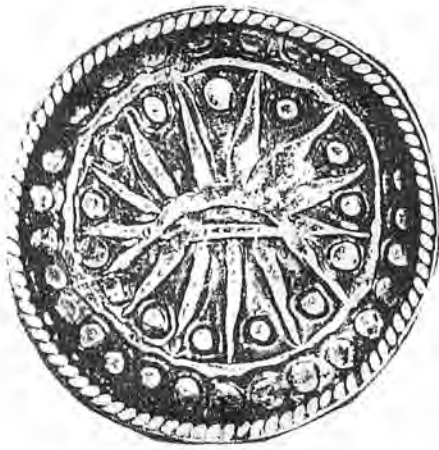


Obverse
(*bhaddapitha*, throne symbol)



Reverse
(*srivatsa*, goddess of fortune symbol)

Coin No. 2, Ratchaburi, Thailand
diameter c. 30 mm.



Obverse
(rising sun symbol)



Reverse
(*srivatsa*, goddess of fortune symbol)

Coin No. 3, Mattaya, Myanmar
diameter c. 30 mm.



Obverse
(rising sun symbol)



Reverse
(*srivatsa*, goddess of fortune symbol)

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