TESTING PLUMBATAE

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MARTIO-BARBULI or PLUMBATAE were barbed and weighted darts which were used by some Roman units from about the third century (Fig.1). Vegetius writes of the Jovii and Herculii Palatine units carrying them, each man bearing five or six in the hollow of the shield. Procopius states that plumbatae were used by mounted troops during the African campaign, under Belisarius (530 AD), and one of these darts, hurled by John of Armenia pierced the helmet of the nephew of Gaiseric, King of the Vandals, killing him.

The paper produced by Mr. Philip Barker on the plumbatae from Wroxeter mentioned the experiments with replicas at the Tower and in Worcester, stating that it was difficult to achieve distances of more than about 30 yards with a hand held throw. Leaving aside the use of a throwing string which extended the range to 70 or 80 yards, it seemed to be worth following up.

A diagram of one of the plumbata heads from Wroxeter was given to Mr. Ron Brown, blacksmith, who made a copy in mild steel. This was attached by socket and nail to the shaft.

It seemed to me that there was no reason for the weapon to be long, since a light throwing spear would have done as well, so a length of 24" (61 cms) was chosen. This would fit the width of an average shield without the ends protruding.

The lead weight, a piece of piping, was hammered to shape over the junction of the socket and shaft. The feathered flights were 4" (10.2 cms) long and 3/4" (2 cms) deep. The shaft extended 1 1/2" (3.8 cms) behind them. This example is not illustrated.

FIRST TESTS

Fig.2: The weapon was held as shown, hurled in the manner of a javelin and travelled a maximum of 22 1/2 yds (20.5 m)

Fig.3: Held between the fingers and thumb, dart was flung forward from this position, flying 12 yards (11 m) and wobbling badly.

The dart was then held by the tail and swung forward over the head by an extended arm. The flight was erratic and the distance was 16 yds (14.64 m).

The shaft was shortened by 3 1/2" (9 cms) after which the flight was steadier but the distances remained roughly the same.

This plumbata was lent for exhibition work and a second version was made to the same length but with only 1/2" (1.25 cms) of wood behind the feathers. The head however was unsocketed and its stalk was glued into a hole drilled in the end of the shaft, a plaster mold was placed over

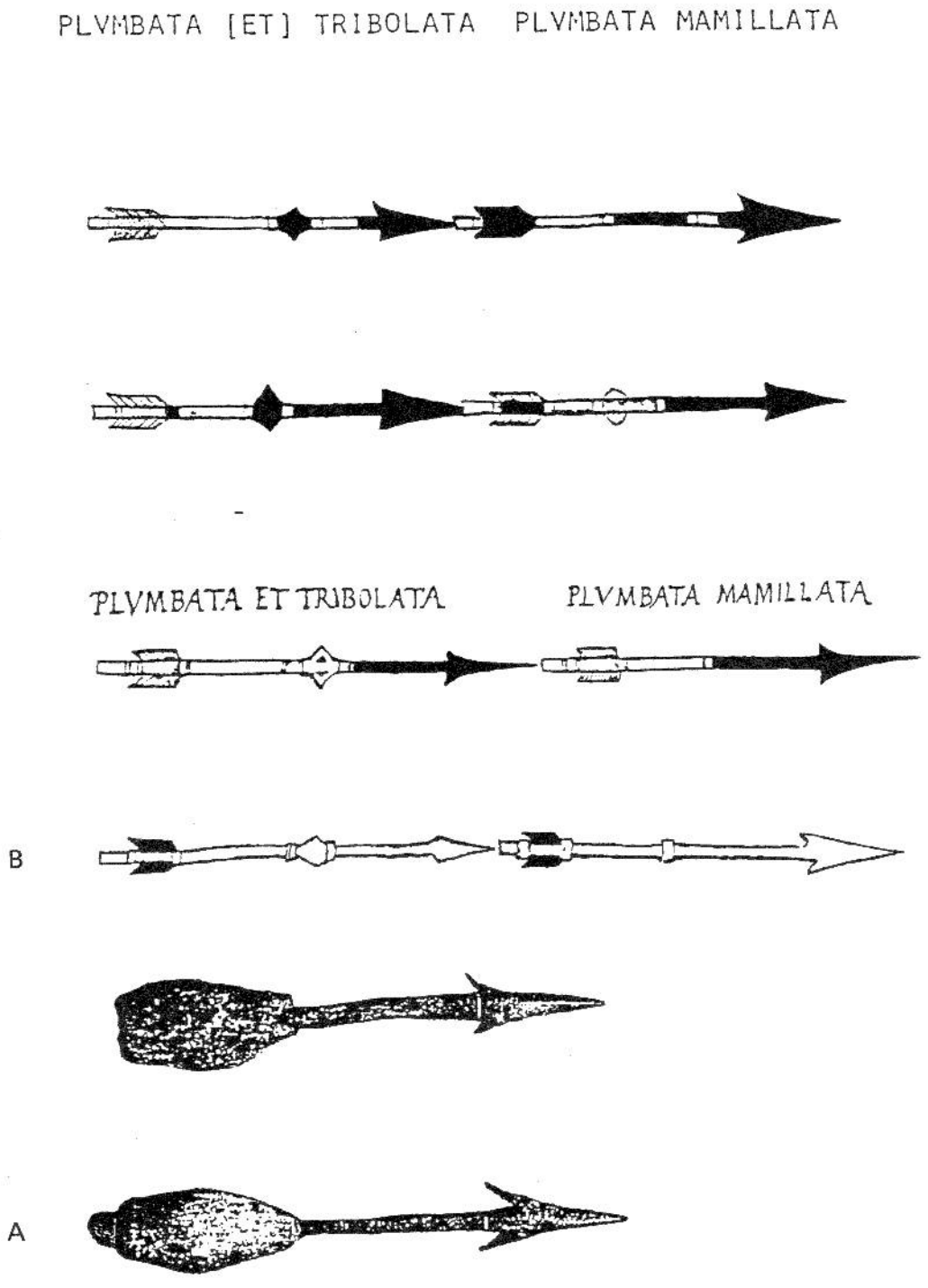

Fig.1: A Plumbatae copied from the Anonymus
B Plumbata heads from Wroxeter

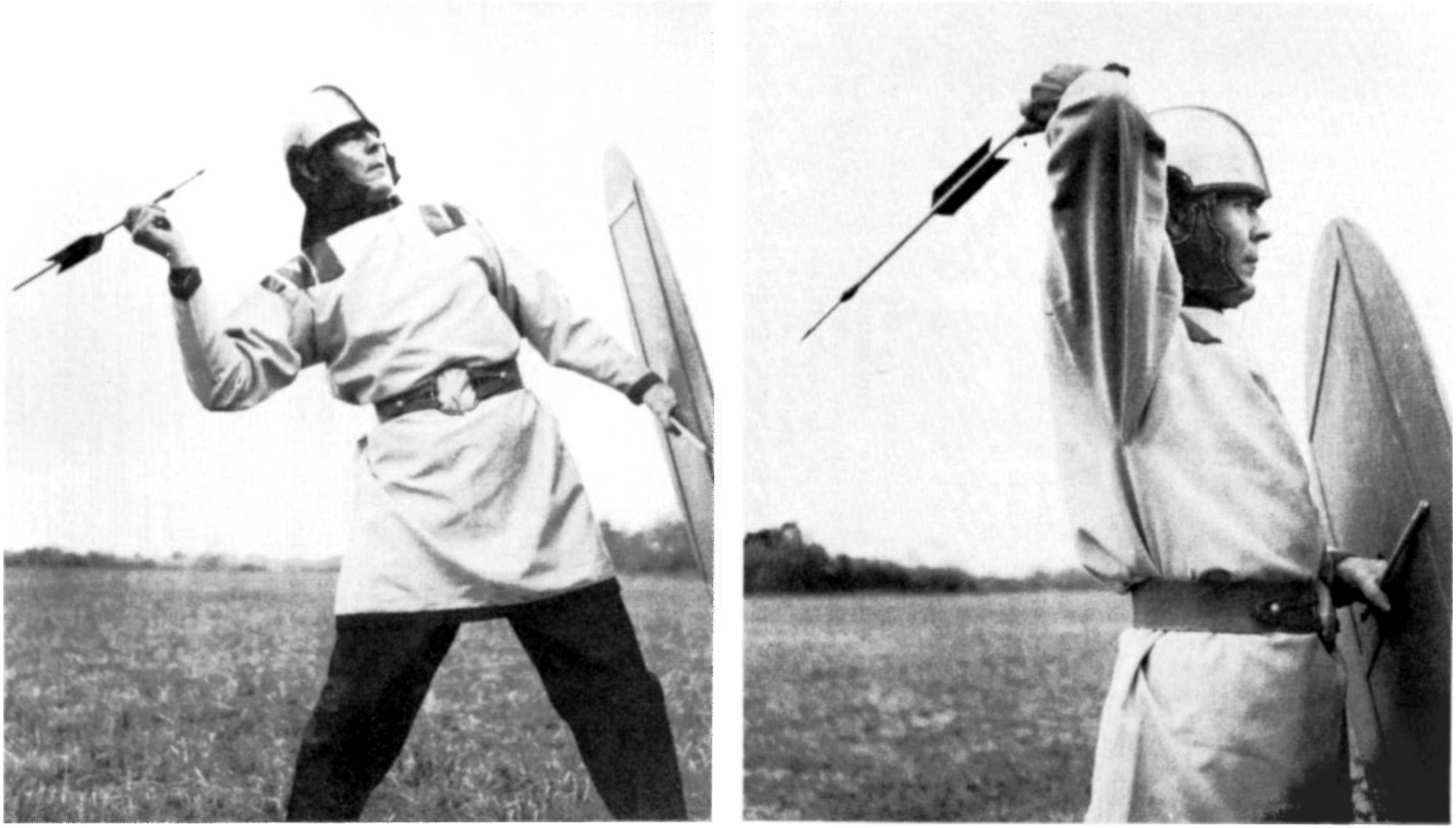

Fig.2 & 3: Overarm throws.

the junction and molten lead poured in. This set almost immediately, which suggests that mass production was speedy. When the lead was loosened later it was seen that the wood beneath was discoloured but not charred.

The new model was passed to Mr. Michael Terry who repeated the tests with no better results and suggested that the dart should be thrown underarm (Figs.4 and 5). When he did this the plumbata travelled 40½ yds (37m). Further throws extended this to 48 yds (44.2m) before the wall of a nearby building intervened. This curled the point into a tight spring but enabled us to estimate the throw to be between 30 and 40 ft (10.5-14 m), the flight descending at the time of impact.

FURTHER TESTS

A number of new darts were made with ball-bearing heads for safety and for ease of repair. These averaged 20" (50.8 cms) in length but varied in construction:

No.1 Had a handgrip of 4¾" (12.1 cms) behind the feathers which were trimmed as before. It travelled 56.8 yds (52 m) and was steady in flight.

No.2 Made the same but with untrimmed feathers. Travelled 38.7 yds (35.5 m). Its flight was steady but slow.

No.3 The same as No. 1 but with no lead weight. Travelled 23 yds (37 m). Wobbled in flight and had no penetration.

No.4 The same as No. 3 but with commercial arrow flights. Travelled 21 yds (19.24 m). It tumbled in flight and did not land on its point.

No.5 The same as No. 4 but with a lead weight. Travelled 41 yds (37.56 m) wobbling on descent.

No.6 The same as No. 1 but with only ½" (1.25 cms) of wood behind the feathers. Travelled 44.8 yds (41.6 m) and was steady in flight. Subsequently this dart was thrown 67 yds (61.3 m) by Mr. David Freeman of the Celtic Association. There was a three-quarter following wind.

The joint winners were darts Nos. 1 and 6. Tested against each other at a rough distance of 30 yds (27.45 m) No. 6 repeatedly matched or slightly exceeded No. 1. This seemed to be because the pinch-hold on the short tail enabled the fingers to flip the dart as they let go. The long hand grip of No. 1 inhibited this.

In consequence the handgrip was cut down to 2¼" (5.7 cms) producing a dart 17¾" (46 cms) long which is comfortable to hold between the thumb and first two fingers. This performs well under 40 yds but has yet to be tested for long distance.

ACCURACY

In a preliminary test Mr. Terry with members of the Saxon Shore Guard threw a number of darts with the long hand grips at a large shield based on those of Dura Europos. After a little practice they were able to bunch the missiles around the target, striking it several times at a distance of 30 yds. The plumbatae were hitting the ground at

angles varying between 30° and 76°. From the fall of one of them it was obvious that a man crouching behind his shield could still be hit. See the simulation in Fig.6.

All these results were gained by people who had thrown the plumbatae less than a dozen times. It will be interesting to see how they improve with practice just as it is interesting to note that the replica plumbatae are gradually assuming the proportions of the originals shown in De Rebus Bellicis (Fig.1).

CONCLUSIONS

The replica plumbatae travel furthest when thrown under arm and have a range approaching 70 yds. This takes comparatively little effort. Consistancy and accuracy can be achieved after a short practice session.

They are ideal for throwing over walls and obstructions, reaching a height that exceeds 30 ft (10.5 m). At shorter ranges they can be thrown both high or low without moving more than one arm and shoulder while the body remains nearly immobile behind its shield or protective structure.

The majority of wounds inflicted on the enemy would be to the heads and shoulders.

ACKNOWLEDEMENTS

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Fig.4 & 5: Underarm throw.

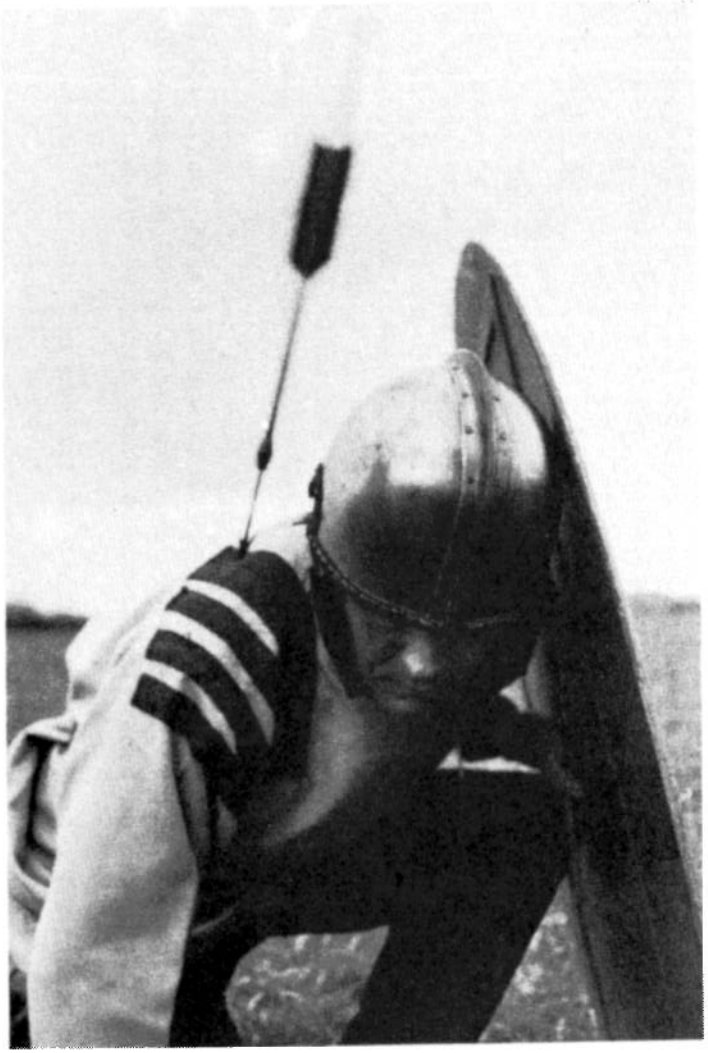

Fig.6: Angle of impact.

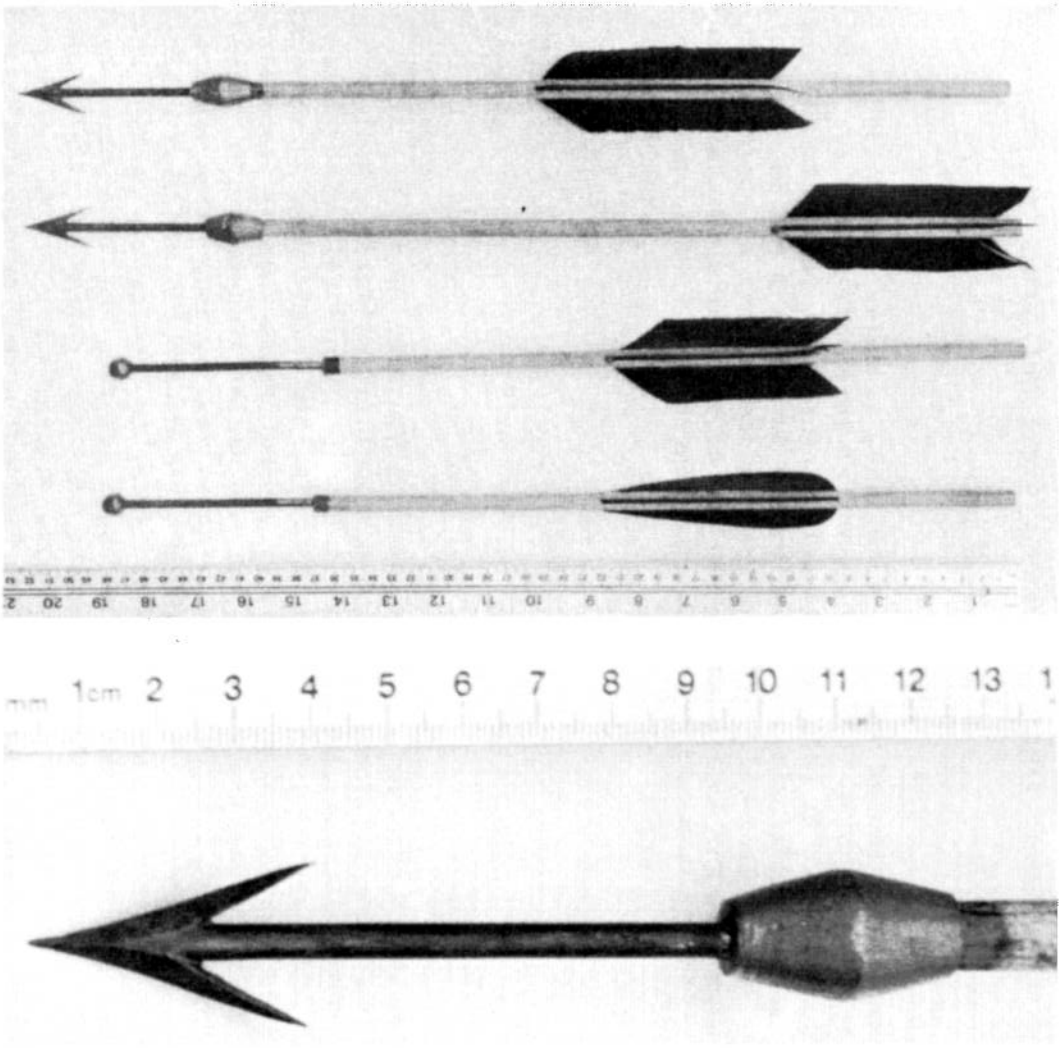

Fig.7: Experimental darts.
Fig.8: Replica plumbata head - shown 1:1.