A short war-bow examined

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Although lacking the charisma of its longer and more powerful cousin, the English longbow, the earlier short weapon gained battle honours disproportionate to its size. Major among these was Senlac in 1066, where massed archery played a vital part in defeating a battle hardened Saxon army.

The short weapon continued in use well into the following century and beyond and the subject of this Paper is a weapon recovered from the site of the 1170 battle of Waterford in Southern Ireland.

The circumstance of the engagement concerns military assistance given by Gwent located Norman Earl, Richard de Clare, to Dermot McMurrough, deposed king of Ulster eho was anxious to regain his former position.

The large army assembled by de Clare included a substantial company of Welsh archers from Gwent and it is conjectured that these were weapons used by them.

An archaeological excavation undertaken in the vicinity of Waterford revealed a small cache of six bows with arrows,- of these three were fragmentary. two were partially complete, with just one complete and stable enough to be carefully recovered. It is a representation of this bow that has been prepared for evaluation by Welsh research Master Bowyer Jeremy Spencer, Court member of the Craft Guild of Traditional Bowyers and Fletchers.

Measurement and other detail of the recovered bow are as recorded. by archaeologist, Dr Andrew Halpin. Irish military historian and Assistant Keeper at the National Museum of Ireland, and are reproduced with permission.1

'Bow complete but broken near centre., with short feature-less terminal at one end and longer, slightly rounded terminal at other. Single straight sided nocks occur 72mm and 43 mm respectively, below terminals, set in opposite sides of the bow. The bow curves slightly, following the string, c.20-25cm from each end, and strongly for the final 6-8 mm. The cross-

section is D-shaped, with flat back and belly, and convex sides; the terminals are flat, sub-rectangular in cross-section ; the belly decreases in width and the sides become deeper and more convex as the cross-section thickens toward the centre. No heartwood/sapwood distinction was visible/ Wood species is Yew (Taxus baccata).

Overall length: 1258mm max (49 inches). (44.1/2 inches between nock grooves) Max width:25mm (1 inch) Max. thickness. 20mm ¾ inch. Circumference at 5mm from end: 44mm. At 10 cm from end :54 mm. At 20 cm: 60 mm. At 40 cm 70mm. At 50 cm: 74mm and at 60cm from end, 75mm.

NB. Three of the other bows (remnants) show string grooves (nocks) on each side of the limb.

An associated arrow, also reconstructed, measures 23.6 inches, including the head. 9mm in diameter tapering to 4.5mm at nock. It is believed that the nock was bulbous, to accord with the supposed string grip, and this has been modelled. A London Museum type 7 needle bodkin was fitted. '

Experimental shooting revealed a draw-weight of 60 lbs at full draw, with a velocity through a chronograph of 80.5 fps at half-draw and 102 fps at full draw. Maximum distance achieved was 189 yards, with penetration of of mail achieved at 50 yards. Method of shooting, - drawn to the chest.

Since circumstantial evidence suggests this bow to have originated in Gwent, may it be adduced a truly native Welsh bow.?. The question is debatable since the form in no way accords with either drawings or description of the Welsh war-weapon. Rather does it resemble the Norman bow?

Of interest are the elongated, deflexed terminals; there is no obvious reason for these, although the lower would give some protection to the string if rested on the ground. It has been noted by a Norwegian bowmaker and archaeologist, Ivar Malde, that the elongated and shaped upper terminal is similar to that on an earlier but longer Norwegian 'viking' bow, recovered at Hedeby and whilst providing no clue as to purpose might suggest a continued Norse association, or perhaps a perpetuated craft tradition

In conclision, Prof: J D G Clark writing for the Journal of the Prehistoric Society 3 suggests that the 'rise of archery in the Gwent region followed the introduction of the bow in the wake of the Anglo -Normans during the last decade of the preceding century.'

The proposition if correct in no way diminishes the skill and determination of early Welsh archers; and there perhaps we should leave the matter. .

References.

1 Military archery in Medieval Ireland. Archaeology and History Papers of the Medieval Europe Brugge 1997 Conference Vol. 11/ Dr Andrew Halpin.

2 Personal correspondence, J.Spencer/I.Malde/H.Soar.

3 Journal of the Prehistoric Society Vol XXIX - 1963 pp 88 / 89

Construction Notes

The original bow was made from a straight and clean yew stave so I selected a Monmouthshire yew stave possessing the same qualities. As both Gilbert and Richard De Clare held the lordship of Netherwent and had a strong association with

Monmouthshire, the original bow could perceivably be made from yew of the same area. Yew is still abundant there. My stave grew in a shaded and rocky limestone area, conditions that lend themselves to producing clean dense and tough staves. Assuming that the profile of the original bows back was unworked, other than to debarked, the diameter of the stave it was constructed from can be estimated. This is an important factor when making a faithful approximation of a bow as it will affect the final section of the bows back and therefore the performance.

The bows section

Bows with very rounded backs place are more highly stressed in tension and correspondingly less so in compression. This can improve performance at the expense of safety as tension failures are usually catastrophic whereas compression strain is often expressed as set and/or frets. Given the originals short working limbs the bow is under fairly high strain compared to many modern recreational longbows. The section around the bows geometric centre is a familiar ‘D’ section that flattens to a ‘pill’ shape towards the tips.

The deflexed tips

A bows outer limbs store little energy, therefore it make sense to reduce the cast robbing limb mass in this area. By contrast with the Waterford bows, the bows of the Mary Rose, which had a much higher draw weights had tips were only around a ½”in diameter, albeit they were horned. The Waterford bows outer limbs are much wider at the nocks but necessarily so otherwise the extended tips would be apt to break away during shooting. Therefore why are the extended tips present despite the reduction in performance they cause? A similar design can be found on the famous Hedeby bow. It has been suggested by archaeologist and archery expert Ivar Malde

that the deflexed extensions keep the bowstring away from abrasive mud when the archer rests the bow on the floor but points out that undeflexed extensions would also achieve this with less labour. The deflexed tips may then have been there to aid in its stringing as they act as a lever without getting a hand in the way of the string. The Waterford bow has self side-nocks that easily facilitate a push/pull method of bracing.

However, the Waterford bows are short so this mitigates for the performance lost by the extra mass as the tips do not have to travel so far as on a longer bow. Thus not reducing cast as much as on a lengthier bow. My approximations had its tips deflexed by emersion in boiling water just long enough to plasticise the wood. However, this must be done before the nocks are carved otherwise the bow's back would split. Perhaps the deflexed tips were just an aesthetic choice and do give a pleasing look to the Waterford bows. Some limb fragments were decoratively carved with a simple but elegant upper limb finial which would have been instantly recognisable by its archer owner.

Manuscript: MS 47682, Holkham Bible
Folio: 6v
Dating: 1327-1335
From: London, England

Name: Pierpont Morgan Library. Manuscript. M.736.
Folio: 14r
Dating: 1130
Artist: the Alexis Master and his workshop.
Place of origin: (Bury St. Edmunds?) England

The bows depicted in the Pierpont Morgan Library and Romance of Alexander are remarkably similar to the Waterford in style and size, and if depicted naturalistically, about the same as a wooden crossbow prod. The illustration from the Holkham Bible is interesting as it portrays the method of bracing described above.

Thoughts on the bow's tiller
The tiller of the bow is that of a classic segment of a single arc with no stiffened centre section. Even the minor vagaries of the grain did not call for adjustment or deviation from the original's dimensions to achieve balance. The bow was tillered to 21", as estimated from arrows that were related to the bows excavation. Given that the nock to nock length of the bow is 44" an arrow of 21" draw length is close to 1/2 of bow length.
The angle of the string to the limb at full-draw shows the energy storage compared to the strain is lower than that of a longer bow due to non-linear strain high. However, this is mitigated by the fast limb recovery speeds of short limbed bows.

The string

No strings related strings survived for reference so I chose to make a full-length stranded hemp string. The bows short length makes using a string from single strands easier. It is also very possible the original string was made of flax. The diameter of the served string was approximately 1/6” / 3mm. It was finished in beeswax.

The arrows

The approximation arrows I made for the testing were more conjectural than the bow with only the bodkin heads surviving. The arrow shafts were unrecoverable and survived as a trace in the soil which indicated a usable draw length of 21”. The shafts I made for the testing were of a 3/8” / 10mm birch. They were bob-tailed and with bulbous self nocks appropriate to the period. A high proportion of needle bodkin armed arrows strongly indicate a military context as these heads are only used for warfare. I fletched the arrows with goose and bound them on with fine linen over which was applied a fat/beeswax shaftment compound.

The bow in use

The bow in use is very pleasant to shoot when one becomes comfortable and confident with the initially high bend in its short limbs. Its handy size would make it ideal for a woodland ambush or use for defence in a castle embrasure. The bows performance was decent for its weight and is a formidable weapon.