

A BOWMAKER'S TRIBUTE TO THE ENGLISH ELM

By Hillary Greenland

They say that you don't appreciate something until it is threatened, or has gone.



The Elm in Europe has had its numbers tragically reduced since the early 1960's because of the Scolytid beetle. This insect bores into the tree carrying spores from a fungus which suffocates its host, of whatever size and strength, by blocking the vessels which carry the sap. To give an idea of the speed of destruction, a 1971 survey indicated that there were over 23 million trees of the species 'Ulmus' in British towns and countryside, and by 1977, 50% of these had disappeared. The destruction has continued unabated—attempts to 'vaccinate' trees or introduce fungus-resistant strains have not met with great success. *Ulmus* is a species native to Britain. The pollen of the Wych Elm has been found in soils dating back thousands of years. This was the species used by the famed archers of Wales during the formative years of the great 'War bow' of the English medieval armies. The Elm is a promiscuous hybridiser. There are several varieties throughout Europe; the most handsome to my mind is the 'English Elm' (*Ulmus procara*), whose origins are disputed—some botanists consider it a native hybrid, others that it was introduced from mainland Europe into Britain by Iron Age tribes.

Millions of these magnificent trees were planted in the 17th and 18th centuries, in parks and gardens, but few survived. Its glorious golden autumn colour and handsome informal growth and billowing clusters of leaves made the English Elm a favourite ornamental tree. Having bark which is particularly deeply fissured, the English Elm has suffered most from the disease and its loss from British lowlands and hedgerows is a tragedy. When I started archery and chose to shoot in the longbow, I learned about the historical use of the Wych Elm for bows (confusingly referred to as 'Wych Hazel' in medieval times), also that English Elm could make a good bow. Like most other bowmakers, I spend a great deal of time searching wood yards for any likely-looking piece of timber—an important part of the 'apprenticeship'! A few years ago I found some large Elm boards in a local timberyard, and the beauty of the wood appealed to me as had the beauty of the tree from which it came.

However, initial efforts to make a bow failed—the wood was too dry—but when cutting it later to make a toolbox, I found a section which still had some 'life' in it. I thought I'd give the wood another try, but decided because of the earlier failure that the deep 'D' section of the English longbow wouldn't be suitable.

Why A Holmegaard Style?

Alongside my interest in the English longbow has grown a fascination with primitive bows, fostered by various articles on these weapons, in particular one by Fleming Alrune in the *Journal of the Society of Archer Antiquaries* here in Britain on the Holmegaard bow, a design dating back thousands of years, these articles stated that they were made from sp. *Ulmus*. So, always looking for new "adventures" I decided I'd try to make this type of bow from my piece of Elm. Not a replica, but a shooting bow to my specifications, which I could test "in the field" and assess for myself the characteristics claimed for this style of bow and the particular piece of wood from which it was made.

The beauty of this age-old design is that the limb tips are kept light: the benefits of this have been long proven to me in the making of English longbows, where the fastest and sweetest shooting bows have the last part of

their limbs rounded and reduced almost disproportionately to the whole. The fiat-limbed section near the handle of the Holmegaard style design resists tensile stresses on the back, so that the bow can work near the handle with reduced risk of fracture, the limb ends are comparatively stiff, reducing string angle and any potential for the bow to stack. The disadvantage is that the change of profile at mid-limb means tillering isn't particularly easy- too conservative and you get a stiff section of limb loss of stored energy too weak and kaput! I was looking forward not only to working the Elm, but also to testing the principles of this design.

The Elm piece was 70 inches overall: the last 8 inches showed sign of advanced rot and woodworm and the grain badly wandered off two-thirds of the way down its length, leaving about 40 inches usable. So there was no choice, the bow had to be spliced in the handle. Growth rings were 13 to 18 per inch and indicated a tree of fairly large diameter. Further study revealed another problem: the grain was more open one side than the other, and twisted slightly. None of these presented a serious problem, and the crosscut revealed that healthy wood continued through the heart of the billet.

The grain lay at 45 degrees to the long edge, and I decided to work the back down to a single growth ring to assess the true nature of the wood before applying more radical surgery. Plane, drawknife, spokeshave and rasp went to work, and initial findings indicated that this bow was going to have a bit of a "propeller," with grain twisting in opposite directions! But I felt somehow the spirit of the Elm and I were working together, and it offset this tendency to twist by offering a degree of reflex. I cut the piece lengthwise forming the billets for the two limbs, and worked the second piece down to a single growth ring for the back. Now I had some true idea of the character of this wood.



Osage selfbow compared to Elm Holmegaard



Osage bow (on right) and Holmegaard: note the different profiles.



Author shooting the Holmegaard bow

One limb was closer grained than the other, and there was a section on one edge that had dried out: this dictated which end of this billet became the handle, as the shaping of the tapered section would remove the unsound section.

One limb had a large degree of reflex near the tip, the other had an unfortunate deflex kink in the grain just above where I'd planned the change in profile. Aah! The challenge of a selfbow -I was delighted with the character this wood had to offer?

I kept the handle and the limb tips wide as possible to help in future correction of any twist. Because of my reservations about the age and quality of the wood, I decided to keep it long -around 65 inches between nocks- this also provided a safety margin for my 27 inch draw when aerial shooting and my tendency to encourage interested archers of all styles and sizes to try a shot out of my 'primitive' bows.

The Elm worked very well under rasp, file, spokeshave and scraper, and whittling it down on belly and sides was easy and satisfying work. I was soon up to my ankles in Elm-droppings. As I "feathered" the grain on the belly, the open grain on one side meant that the bow thickness was not consistent across its section.

The limbs soon began to bend sufficiently for initial bracing. So, with foot on string (and heart in mouth) I flexed the bow and waited for that terrible "ticking" sound that is the harbinger of doom for many hours of honest toil. But there was no sound of failure or any feeling of twist in my hand as I flexed it, so I breathed out a sigh of relief. When braced, a modicum of twist returned to the bow, but was soon overcome with the removal of a judicial shaving or two.

I hadn't enjoyed working on a bow this much for ages! Removing wood where the limbs changed profile required concentration; a slight twist also kept returning as draw length increased, but the removal of a little

wood easily brought the string back to center. I needed to carry out some adjustment to my tillering "eye" too, with so much of the limb's work being done near to the handle, I had to stop myself from madly scraping wood off the mid-limb to get more work from the "outboard", which could have been the end of this particular project!

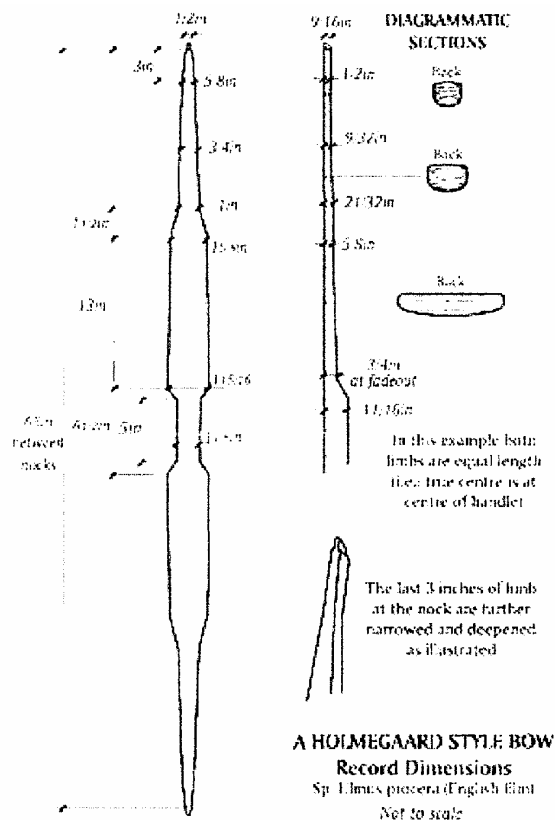
When the bow reached limb dimensions similar to the Holmegaard original it weighed in at 70 lb at 23 inches draw, but was some 5 inches longer. However, direct comparison isn't relevant because of the different grain density, size of tree, degree of reflex, etc. And it wasn't my intention to make a copy. At 65" long, it was around 54lb at 26" and worth a shooting test.

The bow felt powerful, with a smooth, strong draw and no hint of stack. The speed was astonishing for a selfbow! No kick in the hand, either, so I was happy; but as I am not "match fit" nowadays, I was a little over-bowed, (you can see in the photograph that I am struggling to get the string back 24 inches!). Although the bow worked well I had to reduce the draw weight.

This presented me with the opportunity to fine tune the bow. I felt that the limb ends could be even narrower and could work a little more; this would further reduce weight at the limb ends and store more energy. So I whittled down the limb ends and when the bow reached limb dimensions similar to the Holmegaard original it weighed in at 70 lb at 23 inches draw, but was some 5 inches longer. However, direct comparison isn't relevant because of the different grain density, size of tree, degree of reflex, etc. And it wasn't my intention to make a copy. At 65" long, it was around 54lb at 26" and worth a shooting test.

This presented me with the opportunity to fine tune the bow. I felt that the limb ends could be even narrower and could work a little more; this would further reduce weight at the limb ends and store more energy. So I whittled down the limb ends and nocks to as narrow and deep a profile as I dared, and carefully worked on the area where the profile changed to reduce the draw weight overall. This definitely improved performance in relation to draw weight while making it very comfortable to shoot; the bow is under-stressed at my target draw length of 25", but it is plenty fast enough and forgiving to shoot, even at 27" draw. Other archers who have tried it are impressed with its power and light weight in hand.

Four applications of tung oil brought out the warm colour and beauty of the Elm. The bow has been used for a while now, and has developed about 11/4 inches of string follow. It is my current favourite, and its performance surprises many, as does the fact that it is made from English Elm. The arrows come out perfectly and cleanly. Unfortunately, they do miss the target regularly, but life's not meant to be perfect is it?



A slightly technical bit follows: (As all Chronographs aren't set identically, these speeds should only be compared with each other)

Holmegaard style Elm selfbow,

- Length: 65"
- Max limb width/depth: see drawing
- String: 12 strand Dacron (Linen readings similar)
- Test draw weight 41 lb. @ 25"
- Weight-in-hand: 1 lb. 3oz
- Arrowspeed: Brace height: 6" from belly
- Total arrow weight: 370 grain (24g)
- Fletching: 4" helical shield*
- Average speed over 12 arrows: 146fps (360grain arrow with 3" fletch 159fps)

Comparison 1: Osage self flatbow
 (large degree of natural deflex in lower limb)

- Length: 66"
- Mid-limb width/depth: 1 1/8in x 1 1/16"
- String: 12 strand Dacron
- Test draw weight 44lb @ 25"
- Weight-in-hand: 1 lb. 9 oz
- Arrowspeed: Brace height 6-1/2" from belly
- Arrows as above
- Arrow speed: Average over 12 arrows 146 fps

Comparison 2: Pre-stressed English Yew/hickory-backed laminated English longbow

- Length: 66"
- String: 12 strand Dacron

- Test draw weight 38 lb @ 25"
- Arrowspeed: Brace height 6" from belly
- Arrows: as above
- Arrow speed: Average over 12 arrows 148fps

Comparison 3: African Walnut 'Pyramid' self bow

- Length: 64"
- Mid limb width/depth: 2-1/2 x 7/16"
- String: 12 strand linen
- Test draw weight: 40# @ 25"
- Weight-in-hand: 1 lb 4oz
- Arrowspeed: Brace height 6in from belly
- Arrows: as above
- Arrow speed: Average over 12 arrows 140fps