



The making of a longbow *a study of a Master Bowyer*

The early history of England has been written with 'oak gall and arrow'. In a much more peaceful way Marc Grady, Master Bowyer is still keeping the traditional skill of longbow making alive

For over ten thousand years, from pre-historic man through to today's Olympic archers, bows and arrows have played a part in both military and recreational aspects of societies around the world. At its height during the medieval period, the English War bow was the most fearsome and devastating weapon in Europe. When the firearm found its ascendance in the 16th century as an easier option to train militia, archery largely became a sport and pastime of the gentry and landed classes. The late Georgian and Victorian periods saw a huge uptake in the interest of target archery as a social exercise and activity and many of today's archery clubs and societies were founded at this time. Accordingly, the skills and industry of

the bowyer have waxed and waned over a long history of 'shooting in the bow'. Whilst the English 'war bow' is still made and shot by devotees of bows requiring the strength to draw in excess of 80lbs (bows recovered from the Mary Rose were found to be drawing 85 to 180lbs!) the meat of today's longbow makers work is focused on the 'target bow' whose draw weight will be anywhere between as little 20lbs and up to 80lbs.

Exacting Standards

Based in Herefordshire, Marc Grady, a member of a select group of highly skilled Master Bowyers belonging to the Craft Guild of Traditional Bowyers and Fletchers, is busy making modern variants of the Victorian target bow.

The Guild like any overseeing body worth the name, requires its newly accomplished members to prove to the Guild that they have met the truly exacting standards required to make longbows, arrows and strings by presenting 'Master Pieces' at the end of a three-year apprenticeship. The Craft Guild offers the only official qualification in longbow making and associated crafts in the UK, possibly even, the world. The Worshipful Companies of Bowyers and Fletchers respectively, who are no longer active craft guilds, nevertheless give their support and oversight to the Craft Guild's activities. Anyone contemplating taking up target archery should take care to not only have proper instruction but also to purchase



A beautiful matched set of bow and arrows



Some of Marc's leather embossing

their equipment from a Craft Guild member so they can be sure it is made to the requisite standard and with good reason.

Target Bows

Although each element of a longbow target archer's shooting has its own complexities and nuances, it is the longbow which draws most attention. The guidance for the rules of what constitutes an English Longbow is laid down by the Guild in conjunction with the British Longbow Society. The longbow should be matched to the archer's 'draw length' (developing peak power at the furthest point at which they can pull the string back) but also aligned to the required 'draw weight' or how much pull they can muster. Ladies and gentlemen's bows will differ in this regard as will the construction for the purpose for which the archer intends to use them; indoors, outdoors, long distance, 'field' or 'clout' shooting etc. Competitions can require shooting up to 144 arrows in a day and so the bow must be sweet to draw, have no perceptible hand shock and yet deliver an arrow shooting in excess of 150ft per second. A decent quality longbow with regular use can give ten years or so of useful life, but it comes under incredible strain. Unlike any other construction we may make from wood, the compression of the fibres on the inside of the



bow and expansion of fibre on the outside, as the string is drawn, places the materials under extraordinary stress. Furthermore, as the limbs come forward upon release of the string, but are then snapped still by the taught string, this sends enormous shock waves through the woods; so the way the timber is chosen, the bow constructed and shaped is critical if it is to stay the course. Marc creates what are termed 'Victorian style target bows', made for fast, flat-trajectory shooting of tournament arrows and wherever possible using traditional methods. The bows are bespoke to the customer requirements and made from the finest hardwoods, beautifully finished and 'dressed' referring to the decorative fittings and finishings which make each one unique. Marc also offers bow kits, arrows, leatherwork, archery components and a repair service. ➤



Marc's signature arrow pass - abalone shell surrounded by buffalo horn



A bespoke bow with the word 'Gramercy' - Thank you resting against a target

MAKING A LONGBOW

Creating a longbow is an eleven-stage process. The selected pieces of timber are planed and assembled together with glue between them, to form the basic blank or stave. Next, the stave is marked out to give the familiar taper shape running from 1 inch above and 3 inches below the middle towards each end. This is then bandsawn then planed to the marked lines. After that the rough shaped blank is spokeshaved to give the subtle finished curvature and proportion (the depth of each limb is no less than 5/8 of the width) that produce a longbow. However the most critical part of the process is known as 'tillering'. The tiller of a bow is the evenness by which it bends. It must form an even curve when drawn, if not it may not work as intended and might possibly snap at a weak point. A wall mounted pulley and block system is used to test the bow and decide where to remove more wood with the spokeshave, there is an art to this, based on experience.

One small and attractive detail that is usually added to the longbow is an inlaid piece of abalone or mother of pearl placed just above the wrapped grip. This is called the 'arrow pass' and is there to prevent the arrows striking and wearing the bow woods. The next job is to fashion the two horn nock blanks which have recesses in them to fit



Shaping the bow handle

on the tips of the stave. They are bonded in place with two-part epoxy resin and then shaped in-situ. They have a basic consistency in style, with a slot made with a round file for the string to sit in. The nocks are polished on a buffing wheel and after that a finish can be applied to the stave. The remaining job is adding the textured decorative grip in the centre of the stave. In total it takes about five to six weeks to make a longbow and about a week to make the arrows in a batch of a dozen.



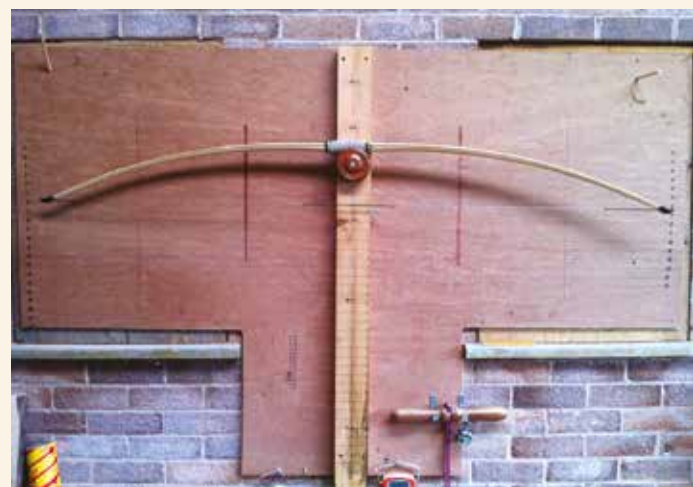
A 'stitching pony' used for holding leather while hand stitching



Cresting the arrow shaft



A laminated stave being glued up



The tiller



Folding bow stands in sapele

PARTS OF A LONGBOW

Stave

This is the beginning of the longbow's construction and is the basic lump of wood or woods upon which the bow is marked out and from which the bow is shaped. This can either be of a single piece of wood such as yew or ash, leading to the construction of a 'self bow' or a combination of woods in a lamination, taking advantage of old fashioned Cascamite or modern synthetic glues for build strength. A misconception is that a longbow is always formed from one long section of timber which is not always the case. Where suitable pieces of woods are found to be too short they can be skilfully joined to make up the stave with tightly worked W or Z shaped fishtail joints. Before the development of suitable adhesives, it was essential that all military longbows were made from yew (*Taxus Baccata*). This is because the soft white sapwood, naturally bonded to the dark heartwood, is excellent in expansion and preventing the fibres running along the back of the bow from breaking. Not all wood is suitable to be called a 'bow wood' and intense debate continues about the engineering properties that make some woods better than others, at not only withstanding the stresses involved but which are also capable of returning efficiently all the energy placed in them when the bow is bent. Examples of woods that have stood the test of time in bow making are degame or lemonwood, greenheart, purpleheart, hickory, maple, and more recently ipe



Three bespoke target long bows



The nock shaped from Asian water buffalo horn



Bespoke detailing for a client



Detail of Marc's signature 'arrow pass'

and bamboo (although this is a grass!) All woods used in modern longbow making are ethically sourced in accordance with CITES and EU Timber Regulations. A typical example of a starter bow would have a maple 'back', a lemonwood 'belly' and a tapered purpleheart core.

Limbs

The top limb and the bottom limb are the names given to the bending parts of the bow with the handle somewhere close to the middle. The bow is not symmetrical and depending upon use is not necessarily designed 'to come full compass' or perfectly semi-circular as there needs to be a stiff mid-section to anchor the base of each limb and to generate the power. The limbs are marked out along with the handle and then cut from the stave. After shaping, these limbs are taught to bend through a process called 'tillering'; carefully bending the bow inch by inch and removing wood from stiff areas to create the perfect set of curves, see below.

Nocks

The word nock is derived from a Dutch word identifying the end of a pole or mast to which something is affixed in a notch. The ends of the bow (and one end of the arrow - see above)

are called the nocks and are the two pieces of horn that fit on either end of the longbow limbs to hold the string and protect the bow wood from wear. Longbow makers like Marc hand carve these from Asian water buffalo, cow or stag horn.

String

A longbow doesn't work without a string. In medieval times the best strings were considered to be made by 'Stringers' on the near continent and hence a traditional string is made using a 'Flemish inlay' technique. A modern variant of this uses the same method but with twisted strands of Dacron B50 or a polypropylene type material like 'fastflight'. It is made up according to the length of the bow, the speed required of the bow and the bow's poundage, which refers to the draw weight. The length is important because around midway along its length it is wrapped or 'served' for durability and comfort and where there is a tiny marker for consistently locating for the arrow on the string.

Arrows

While a bow is the 'projector' the arrow is the 'projectile', it is the arrow that does the flying and the scoring. A bow is nothing without arrows and a modern target bow requires very

different arrows to those once used in warfare. Each arrow (sold by the dozen) must be 'matched' to not just the archer's draw length but also the bow itself. Too weak an arrow shot by a right-handed archer is likely to miss the target to the right or even to break upon being 'loosed' (never 'fired' – this comes from the use of the musket and has never been associated with archery other than by the layman). Too stiff an arrow shot by a right-handed archer will miss the target going to the left by a long way. (vice versa for a left-handed archer!) Therefore, the spine has to be just right. Similarly, critical, the arrows must all weigh the same as a heavier arrow will fall sooner than a lighter one and consistent aiming is required to deliver the highest scores.

Point/ Pile

Gone from regular archery in this country are the splayed arrowheads that are impossible to remove from human or animal flesh or diamond shaped tips to penetrate chainmail or armour. Instead a simple brass bullet shaped point is all that is required to penetrate 4 inches of the standard straw or foam competition target from a hundred yards. These will be from 30 grains to 125 grains in weight (15.4 grains to a gram). Notwithstanding the focus upon competition archery it is important to remember that these are still extremely dangerous weapons capable of inflicting serious or lethal injury.



A finely matched set of 'barred' fletchings made from turkey feathers

Shaft

Marc makes perfectly matched bespoke arrows as well as standard club arrows. The shafts aren't standard dowel, they are made from Port Orford Cedar shipped from Oregon and known for its lightness, strength and elasticity. Other shaft woods are Scots or Norwegian Pine and Sitka Spruce; each has its own characteristics and adherents. Arrow shafts for target archery are generally $\frac{3}{32}$, $\frac{5}{16}$ or $\frac{11}{32}$ of an inch in diameter. A Victorian skill that it still well regarded and undertaken by Marc is to 'foot' the arrows by inserting a wedge of exotic hardwood into the front of the shafts thereby strengthening the arrow at the point of impact. Arrows can be tapered at either or both ends to alter the balance point and flight characteristics of the arrow. A well-matched set of arrows will have no greater than 8 grains' difference between the heaviest and the lightest. The arrows shafts are usually decorated with a series of rings or 'cresting' to identify them from another archer's and given several coats of durable varnish to seal them from either giving or taking up moisture.

Nock

An arrow has its own nock which is made of a protective material to prevent the end of the shaft splitting when locating onto the string. Inserting a sliver or wedge of horn has been done over the centuries and is still undertaken by Marc but more commonly today it is a coloured piece of plastic which is used. In common with the fletchings there are various colours to choose from and the arrows can be made up in a specific colour scheme to suit the user.

Fletchings

Once undertaken by a 'fletcher' the affixing of feathers to stabilise the movement and flexing of the arrow



Portrait of a Master Bowyer

"I learnt everything I know from my father who was himself, a master bowyer" says Marc. "He along with other craftsmen had to relearn ancient skills that were all but lost and use them to create modern recreational bows, which was an interest in Georgian and Victorian times, but the techniques have been updated to use modern day materials. My father was a founder member of the Craft Guild and while I learnt alongside him, I still had to go through a lengthy apprenticeship before I could be considered a master of my craft".

Marc continues "because of people like him and because of the work that I do, we are seeing a huge resurgence in the use of the longbow. While it may have been considered a minority sport thirty or forty years ago to shoot a wooden bow, there are a good number of archers shooting long bows today. There are 47,000 archers registered with the governing body within the country and a good quarter of those will be shooting wooden bows. Nearly everyone that comes to me to have a bow made is generally a member of the British Longbow Society.

in flight is known as fletching. These fletches or fletchings were traditionally of goose feathers taken from the primaries of the bird. Marc does still cut and fletch using goose feathers but nowadays it is more common to fletch with pre-cut and dyed turkey feathers. These are profiled in shape to assist the arrow flight whilst reducing or increasing drag. ■

If you have an interest in archery visit: Marc Grady at:
www.longbowemporium.co.uk
 The Craft Guild of Traditional Bowyers and Fletchers:
www.bowyersandfletchersguild.org
 The British Longbow Society
www.askarts.co.uk/page2.html



Victorian style round quiver with arrows