Hunting

I’ve always had an interest in primitive hunting and trapping as its one of the earliest examples of mechanical engineering e.g. windlasses, springs, pulleys and levers. The selection of materials with the correct properties to meet requirements e.g. wood, bone or stone. This interest is purely theoretical as I have never used these techniques in the wild. I would also add that in normal situations you should NOT use these techniques in the UK as some are illegal and others require the correct permits, licenses or the land owners permissions.

Throwing or Rabbit Stick

Figure 9.1.0 : Australian returning boomerang
Variations of the throwing stick or rabbit stick can be found in many cultures all over the world, also known as a throwing club, throwing wood, baton, kylie, or the well known returning and non-returning boomerangs of the Australian aborigine’s. Used for hunting small mammals and birds, typically made from medium or hardwood, 12 to 24 inches in length with one end either weighted by a thicker heavier section or a curve. This extra weight or curve imparts momentum to the stick when thrown, increasing flight stability. I don’t fully understand the physics and subtleties of the various different designs, but there seems to be four basic styles: club, equal single bend (a stretched ‘V’ shape, less than 45 degrees), unequal single bend (a stretched ‘L’ shape) and double bend (a stretched ‘Z’ shape), examples are shown in figure 9.1.1. From reading around and searching the web, you don’t normally see a straight, constant diameter throwing stick, the exception to this is when metal, typically lead is used weight one end. Throwing sticks having a bend are normally thinned downed flat i.e. a bi-convex or thin oval, improving their aerodynamic profile, reducing weight, therefore, allowing them to travel greater distances. This profile is optimised for the returning boomerang, forming an aerofoil profile i.e. a flat bottom and a curved top, allowing the boomerang to generate lift. A common characteristic of these throwing sticks is that their edges are thinned down to a point, concentrating the kinetic energy on impact. Club type throwing sticks have a solid bulge, protuberance e.g. circular or oval, at one end and tend
to be shorter than curved throwing sticks. Again the club end may be pointed to concentrating the kinetic energy on impact e.g. pointed, forked, tear drop or conical.

Figure 9.1.1 : Throwing Sticks

Throwing sticks with a bend are thrown using an overhand, sideways throwing action, imparting a spinning motion on the stick. This sideways spinning flight path increases the probability of making contact with the target. Some quotes
on using throwing sticks:

“No deviation normal throwing sidearm motion, distal wing curved inward, projectile low to the ground was indicated. The throwing arm moved with a broad sweep using the whole arm but with some degree of wrist snap at the end of the action” Koerper, Pinkstopn and Wilken

“First, align the target by extending the non-throwing arm in line with the mid to lower section of the target. Slowly and repeatedly raise the throwing arm up and back until the throwing stick crosses the back at about a 45-degree angle or is in line with the non-throwing hip. Bring the throwing arm forward until it is just slightly above and parallel to the non-throwing arm. This will be the throwing stick's release point.” The Web

“The throwing wood is a crooked piece of wood, which is able to fly with or without having a grip. Generally it is thrown and then rotates in the air, but occasionally it also can be used as a club. Unlike the throwing club, the throwing wood does not concentrate on the effect of hitting. Only the variant which returns to the thrower is called a boomerang.” Lenoch

“Such a basic club can be thrown either overhand (when, for instance, you're trying to hit the side of a tree) or sidearm (when you're in an open area, where brush won't interfere with the stick's flight). In using the first method, point your left foot at the target (if you're a right-hander southpaws can simply reverse these directions). Then, holding the smaller end of the stick loosely in your right hand, bring the weapon back over your shoulder and hurl it, with good end-over-end spin, straight at the mark. At the moment of release, your shoulders should face the target squarely. The sidearm throw is similar to the motion used in stroking a tennis ball with the racket. Point the left toe at the target, bring the stick to a cocked position at your side, and throw it, squaring your shoulders and snapping the club as if you were cracking a whip to give it spin.” Brown

“What I remember from Tom's class was to pick a stick that was the length of the distance from your armpit to your wrist, and about 2 inches around. Such a stick will weigh between 2 and 3 pounds. If you throw it at any animal, any hit will break something, like a rib. We learned both an overhand throw, and a sidearm throw, where we would actually bounce the stick off the ground just short of the target, so it would bounce up and take the target out. On rabbits which sit so close to the ground, this particularly throw is used, unless there is brush between you and the sitting rabbit.” Paul

Club type throwing sticks can be thrown using a more targeted throwing action. Again, thrown using an overhand throwing motion, however, this time no sideways spin is used i.e. the club is thrown straight, heavy end first, this end making contact with the target. The handle increasing leverage and speed allowing the club to be thrown further and faster. Some books suggest that a twisting flick should be added just before release i.e. rotating the club inline with the directions of travel, improving its stability in flight.
Figure 9.1.2 : Equal single bend throwing sticks

Figure 9.1.2.1 : Club throwing sticks
Length = 30cm, Width = 3-8cm, Thickness = 3-8cm

Figure 9.1.2.2 : Double bend throwing sticks
To make a throwing stick that contains a bend the simplest solution is find a piece of wood with a suitable natural bend, although this is sometimes easier said than done. However, as this type of throwing stick is normally thinned down to a flat profile, any unwanted bends or bumps can be minimised or removed completely with a bit of judicious trimming. When a suitable piece of wood cannot be found the wood can be formed into a curve by heating and bending. One technique I’ve read about is to heat green wood over hot coals to make it pliable, then placed it between two rocks, placing a heavy pressure rock on top to form the bend. Alternatively the wood could be steamed to make it more flexible, removed from the rocks when cooled.

The equal length single bend throwing stick shown in figure 9.1.2 is made from Beech, cut down and shaped using
an axe to give a more aerodynamic profile. The club throwing stick shown in figure 9.1.2.1 is made from an evergreen shrub, not sure what species, a medium hardwood. Using a saw, stop cuts are made around the head, an axe is then used to form the handle (the stop cuts preventing the splits progressing to far). The double bend throwing stick shown in figure 9.1.2.2 is made from Ash, simply cut down and shaped using an axe. Ideally the top and bottom bends need to be a little longer and more angled, but this was the best of the wood available. The long single bend throwing stick shown in figure 9.1.2.3 is made from Birch. The bend is naturally formed, again shaped to improve its aerodynamic profile. Comparing these throwing sticks with some traditional non-returning Australian aboriginal boomerangs from the central desert they may need to be thinned down a little more. However, some examples from Tasmania and eastern Australia are of a similar size (or a little bigger) i.e. approx 2.5 feet long and 1 inch wide tapering at the ends slightly. Not sure what the best balance between weight, width and aerodynamic profile is. Note, its common to have scratches, groves carved into one end, to form a non-slip grip. The weighted throwing stick shown in figure 9.1.2.4 is made from Pittosporum with a flit head. The stone has a naturally formed hole allowing it to be easily mounted on the wooden handle. The handle is shaped to fit this hole, initially roughed out, the stone is then placed on the spike and tapped into position and then removed i.e. held upright and the bottom of the handle knocked on the ground. The compacted, marked areas are then trimmed away and the process repeated until the stone sits securely on the wooded handle. This is important as the spike will not be sufficient to hold the stone in position if the club lands awkwardly (not even a hardwood). Finally the stone is lashed in position through a hole within the handle.

Figure 9.1.3 : Thinned down single bend throwing stick with improved grip
Length = 43cm, Width = 4-5cm, Thickness = 1-2cm
To assess the performance of each of these throwing sticks they were tested at various distances. The equal length single bend throwing stick (figure 9.1.2), flew like a lead balloon. Over short distances it was ok, but as it slowed down it would loose stability allowing the broad face to flip up, causing it to fall out of the air. To improve its flight path stability the stick’s width and thickness were reduced as shown in figure 9.1.3. This problem highlights the conflicting requirements involved in making a throwing stick i.e. to produce a flat, stable, long flight path requires a light weight, thin stick, however, to increase impact force requires a weighted, heavy, thick stick. Increasing a sticks weight can also have a negative affect on its throwing distance, requiring the release angle to be increased (relative to the ground) to improve distance. For the example in figure 9.1.3 reducing the stick’s width improved stability, although the handle was still difficult to hold, therefore, one end was thinned down and ridges added to improve grip. Although not as bad as the previous example the double bend example shown in figure 9.1.2.2 suffered a similar fate. Thinned down the lower section but kept the top thick to increase its weight.
Figure 9.1.3.3: Large single bend throwing stick with weighted ends  
Length = 72cm, Width = 4-5cm, Thickness = 1-5cm

Figure 9.1.3.4: Short range club throwing stick  
Length = 29cm, Width = 3-8cm, Thickness = 3-8cm

Figure 9.1.3.5: Long handled club throwing stick  
Length = 60cm, Width = 2-6cm, Thickness = 2-6cm
Recently I was introduced to a variation upon the single bend throwing stick design as shown in figures 9.1.3.2 (Pine) and 9.1.3.3 (Beech). These designs have a thinned down middle section shaped to a rough oval aerofoil. The ends of the stick are kept to the original diameter, carved slightly to reduce drag at the tips and lightened where required to balance the throwing stick at its central bend. These thicker end pieces seem to give the throwing stick a bit more stability in flight, I guess due to gyroscopic effect generated by these weights as it rotates i.e. keeping the throwing stick in its plane of rotation helping to prevent that fatal fluttering and instability. As always this extra weight has its advantages and disadvantages i.e. allows the throwing stick to impart a higher impact force, but at the cost of a shorter flight duration. Had the chance to experiment with a couple of different throwing sticks recently. The environment in which I used them included a mix of terrains, from fields, open woodland to dense forest. From practicing with these sticks I’ve come to the conclusion that I need a lot more practice and that trees seem to have a strange magnetic attraction on throwing sticks i.e. doesn’t seem to matter what you aim at a tree always gets in the way. I found the larger heavier throwing sticks e.g. figure 9.1.3.3, more difficult to aim, either releasing them too early or too late, overshooting or undershooting the target. I’m guessing this is due to the large amount of physical force / movement required in throwing these sticks i.e. a long arm swing and body twist, rather than a quick sharp arm / wrist flick. The advantage of these larger sticks is that the area covered by its rotational plane is significantly bigger than that of a smaller throwing stick, therefore, somewhat compensating for this aiming difficulty. Even so I still found it more difficult to consistently hit a target with this type of stick. Another disadvantage of the longer throwing stick is when you are in woodland i.e. finding a flight path through the trees. In these situation you have to throw the stick in the vertical plane to avoid the trees, limiting the advantage of this longer length. In such environments a shorter throwing stick is easier to use (and carry), some examples are shown in figures 9.1.3.2 and 9.1.3.4. I was told that the throwing stick shown in figure 9.1.3.4 is similar in design to a poachers ‘bullet’ stick used to take rabbits that had bolted into thick grass for cover. This type of short throwing stick is definitely easier to use in confined spaces. Looking at other throwing sticks of a similar design the handle’s are quite a bit thinner and shorter than the example I’ve carved. I was told this reduces the turning affect the handle has upon the throwing stick allowing it to travel in a straight line instead of spinning i.e. weight end first followed by the handle. However, I always seem to end up with a spin. Below are some useful documents on throwing sticks ive found on the web (due to possible copyright conflicts these are only accessible from the local machine):