Dear Colleagues

**Good scores (?) from all body positions: high, low, straight on, bent leg, straight leg**

**The Problem:** a learner watching shooters compete at a prize meeting wanted to know which body position would best suit himself. Their body positions were high, low and straight-on, some with the right leg bent, while others preferred to shoot with the leg straight. What he saw was confusing because they were all thought to be producing good scores. All had been taught by club members.

This article describes body positions and scores, i.e. really good scores.

**Observations:**  in his search, the learner-shooter found in the prize lists for the meeting that there were some who scored 50.10, even more than once. One shooter was widely known to have scored this in club shooting more than 20 times in the past year. At the end of the prize meeting, the aggregate lists showed that the winner had scored an average of 50.8 over all ranges. There were others who scored an average of 50.7. Of course, this did not happen when wind conditions were more difficult.

When the learner walked behind shooters on the firing point he observed first-hand that:

* between shots many were moving a leg, their buttocks, the forward elbow and other parts of their bodies [NO, do not do this]
* prior to each shot, many could be seen moving the left foot about a cm or so to one side, keeping the foot still until a few shots later, it was repositioned a cm or so again [YES]
* most could be seen with their forward elbow positioned 5 to 10 cm on one side of the rifle [NO], while others had the elbow under the rifle so that the forearm was positioned vertically [YES]
* some had the sling firmly around their gloved hand [NO], while others positioned it on the arm above the cuff of their shooting coat, I,e, toward the elbow [YES]
* some did not use a shooting glove [YES], while for some, a thick glove held the stock close to and even against the front sling swivel (often a smallbore hand-stop fitted to the stock) [NO]
* many had the forward supporting arm under tension, shown by the white knuckles of the hand and fingers around the barrel [NO]
* some had the butt loose on the shoulder, so that to reload, it was allowed to slip down to the ground [NO], whereas others positioned it firmly at the shoulder using the thumb as a shoe-horn[YES]
* when dismantling the position to in order reload, some barrels could be seen waving around at the sky above the line of targets [NO]; whereas other shooters barely moved the rifle at all, neatly slipping a round into the motionless chamber, without rain wetting the cartridge or action [YES]
* different versions of rifle stocks were being used, some with thumb-holes and others with a beautifully-carved wood for the thumb to fit around the rear of the action [NO]
* the most comfortable shooters of all had their faces resting firmly against a polished fiddle-back cheek-piece; one shooter with such a cheek-piece, complained about the number of subtle wind changes, which sent his shots to either side of the bullseye [NO face tension]
* a pretty slip of a girl, shooting F Class, kept her thumb slightly to the right of the recoiling rifle [YES], while expertly maintaining the scope-sight dead still to release the second stage of the trigger [YES], scoring 60.7/60, then 90.11/90 at 700m.

The learner-shooter was since advised that to achieve the smallest groups, he should not only master the techniques of re-loading, but use a particular projectile design, loaded to achieve a particular velocity from a recommended barrel [YES].

**Discussion:** shooters trained in physiology and optics have, since the introduction of rifle shooting as a sport in 1859, openly advised shooters which techniques comply with the laws of physics. In the 19th century, there was a high proportion of medical practitioners, physicists, engineers, mathematicians and ophthalmologists. The laws of physics were well-known among leading shooters, many of whom took their techniques to World War I and did not return. During the 20th century such advice was limited. Those who understood the laws had a clear advantage and became leading shooters. In Observations, it was clear that many techniques in wide use today conflict with the laws of physiology.

In the 21st century, leading shooters now comply with the following principles:

* there is a natural point of aim associated with the shooter’s body, which must be confirmed prior to every shot and frequently corrected by moving part of the body a cm or so, or the group will split and produce two or more groups across the aiming mark [a shooter is unaware of movements which change the natural point of aim]
* correcting the natural point of aim involves sideways movement of the left foot as little as a cm, with forward or rearward movement of the navel by as little as a cm
* a rifle may only be supported dead still if arm muscle tissues are not utilised or if the skeletal structure is held still by a sling or rifle rest
* a rifle supported dead still with the aid of a sling, must not involve the use of muscle tissues to pull the weight of the rifle sideways and bring it above the elbow (as fulcrum); hence, the elbow must be positioned directly under the rifle
* achieving the natural point of aim at the outset when setting up the prone position, will govern the angle of the body relative to the target and height of the rifle above the mound
* in order to adjust the natural point of aim with minimal movement, both of the shooter’s legs need to be straight, so that only one meeds to be moved sideways instead of each buttock, one at a time (i.e. if a leg is bent)
* the rifle must be allowed to travel backward under recoil, without energy absorbed by: a thumb at the pistol grip, the forward hand at the front sling swivel (or hand-stop), a thumb behind the action, or by the thumb bearing within a thumb-hole, i.e. the maximum amount of recoil is to be absorbed by the shoulder (TR) or rifle-rest under friction (F Class)
* the rifle should not be subject to varying sideways tension from a cheek-piece or the hand on the pistol grip (i.e. tension varying from shot to shot)
* the smallest group relies upon the trigger-release technique, i.e. release of the imagined second pressure of the trigger, with the aiming mark dead centre and motionless in the foresight ring or scope element
* the group achievable with a target rifle is smaller than 1.0 MOA, i.e. the V-bull
* the group achievable with an F Class rifle is smaller than 0.5 MOA, i.e. the X-ring.

**Practical:**nearly all techniques need to be practised until they can occur without thinking. Trigger-release and limp arm muscles are the only techniques the mind should focus upon.  With practice, releasing a shot within 3 seconds requires no thoughts of the breathing cycle.

**Conclusion:**  a shooter who seeks to achieve the smallest possible group needs to utilise the laws of physics as applied to the body, allowing for gravity, adjustment of the natural point of aim and the intended absorption of recoil.

Best regards

Geoff