Dear Colleagues

**Adjusting a rear- or scope-sight when a shoot contains tremor and unaffected shots**

**The Problem:**nearly every shooter commences a shoot by releasing shots which have been affected while others are unaffected by nervous system tremors. Unaffected shots produce a small group in the centre of the V-bull (TR) or X-ring (F Class). However, shots affected by tremors may appear in wider groups around the perimeter of the bullseye or 6-ring. That is, both types of group are centred on the same point in the middle of the target. At other times, a shooter may produce a group of affected shots often centred at 4 o’clock near the edge of the bullseye. The affected group of shots may also be centred at other positions around the target.

Hence when starting a shoot, shots are often in groups both near the centre of the target or at 4 o’clock, near the perimeter of the bullseye. After 2 or 3 shots the shooter needs to make a decision as to which sub-group is due to unaffected shots. If the wrong group is selected, the shooter can expect an adjusted shot to appear in the inner ring at high-left.

This article describes a basis upon which to centralise a group with the rear-sight (TR) or scope-sight (F Class)

**Discussion:**the writer remembers in the mid-1950s shooting on the same mound with the coach of a State Rifle Team, who was adamant that at 900 yards, it was a waste of time to move 0.5 MOA. This was because such a small move would have no significant effect upon the location of a group in a bullseye (about 2 MOA across). In his mind, there should be no sight adjustments at 900x which were less than 1 MOA. The writer was then much younger and hence, continued his own idea of sight changes, unbeknown to the coach!

In fact, the writer knew his club shooting would not be observed by the coach. So to centralize a group he moved the sight in what can only be described asbits and pieces. Very often such sight adjustments at 900x were as little as 1/4 MOA.Sometimes, a group just inside the bullseye line at 9 or 3 o’clock would be left unaltered while receiving further shots into that group. This would happen while the flags did not indicate a likely change of wind strength, which would send a shot out of the bullseye. This type of shooting required shots to be released without delay, with as many as possible released while the wind remained at the same strength. Perce Pavey was well known for this approach, releasing shots quickly into a group on one side of the bullseye. He knew when a wind change was likely to send a shot toward the centre rather than outward to an inner.

At this time, the writer soon realized that the state team coach was working on the impossible assumption, that the size of a group was as wide as the projectile. He knew of course that this was impossible. The coach had after all, spent a lot of time helping many shooters reduce the sizes of their groups.. This same assumption still occurs in the 2000s when F Class shooters aim off. Those who aim off soon find they have overcorrected, sending shots across the 6-ring and out the other side, to score a bullseye and lose a point.

Hence, the writer devised a rule based upon a realistic group-size. The rule stated:

* for a single shot close to the boundary of the 2 MOA bullseye, a rear-sight or scope-element should be moved ½ MOA toward the centre. This is only one quarter of the mathematical distance across the bullseye and hence, the shot is unlikely to go right through to the other side of the bullseye.
* for a single shot close to the boundary of the V-bull (or 6-ring), the sight should be moved ¼ MOA toward the centre. This is only one quarter of the distance across the V-bull or 6-ring.
* for a single shot close to the boundary of the X-ring (F Class), the sight should be moved 1/8 MOA toward the centre, i.e. only one quarter of the distance across the X-ring.

The rule for these sight changes also assumed that it was possible to roughly indicate the location of a group from only one shot, instead of firing off 2 or 3 shots, to see where the group was forming. Of course, 2 or 3 shots would give a far more accurate idea where the group was located. However, the shooter was also working with confusing shots affected by tremors, while other shots were unaffected.

**Practical**:  the greatest help a coach may give to a selected team, is to assist each shooter to hold the rifle dead still and at the same time, release a shot without generating a tremor. This is the renowned trigger-release technique in wide use before World War I.

The first thing a coach should do to help a TR shooter overcome tremor shots is to assist the person to support the rifle dead still. More than 90 percent of TR shooters do not support the rifle with the forward arm vertical. This means that some arm muscle tension is involved. Any tension in arm muscles detracts from the rifle being dead still. Upon a shooter being taught to do this, he/she will be among the leading 10 percent of shooters able. Many try to move the elbow under the rifle by forcing it, only to introduce tension into muscles of the upper arm and shoulder. This introduces tension and also changes the natural point of aim.

To support the rifle with the elbow underneath and forearm upright, the prone shooter should first imagine a dotted line between the eye and target. Then raise the forward elbow and place it well out in front and under the dotted line. Keeping this elbow, chest and legs perfectly still, the RH shooter then raises the butt to the shoulder, using the right thumb as a shoe-horn. When the shooter aims, the rifle is found to be pointing high-left. The left foot is then moved a cm or so to the left until the rifle is aiming above the target. Every muscle must remain still! While still aiming, the navel is moved forward by a cm or so, until the sight comes down onto the target. Observe the left elbow under the rifle, with the stock resting on the web of the thumb; not the palm. With the butt on the ground, the right hand then pulls the sling as far as possible down the forearm, over the cuff of the shooting coat. As a result of using the Bisley twist, the sling fits around the forearm. With the sling set in this way the front hand cannot slide along the stock. As well, this enables the foresight to be held dead still, without the forward hand absorbing recoil, because it can be placed several cm behind the sling swivel. If there is a hand-stop, designed for use with a smallbore rifle; remove it.

TR and F class shooters need to hold the sight dead still on the target during trigger-release, with no sign of movement due to the trigger finger. With the rifle dead still, take the first stage quickly until the trigger bites. Then very slowly pull the imagined second stage, not moving the foresight or scope element, with the mind focussed on how far the trigger moves until discharge happensas asurprise. This ensures that the mind does not wander before the shot has departed, i.e. starting to think of looking at the screen or reloading. The aiming time should only be 2 to 3 seconds longer than normal in the second stage.**This tricks the nervous system into not generating a tremor.**Through this, the shooter achievesfollow-through.

**Conclusion:**every coach should work with team members to overcome a wide group due to tremor shots. A tremor group can appear around the boundary of the bullseye (TR) or 6-ring (F Class). It may also appear as a simultaneous 1.5 - 2 MOA group centred anywhere around the bullseye ring. Hence, a shooter who has shots both in the small V-bull and a wide boundary group, has little chance of a group with a large number of Vs or Xs. Both TR and F Class shooters use the trigger-release technique to hold the sight dead still, while carefully releasing a shot and tricking the nervous system into not generating a tremor. The trigger-release technique enables a TR or F Class shooter to score 50.10 (TR) or 60.10 (F Class).

Best regards

Geoff