Dear Colleague

**A common confusion of groups - tremor shots and 9 to 3 o'clock shots**

**The Problem:** there are shooters who enjoy grouping within the V-bull (TR) and then, pull out an F Class rifle and again group just as easily within the X-ring. However, without warning they find that they can no longer do this. The shooter may complain:  I can’t do it anymore. It can’t be the rifles because both produce similar groups. What the shooter finds in each type of shooting is a single large group with sub-groups at 9 and 3 o’clock. Friends say little because it appears that wind changes could be the problem. Otherwise, no readily available solution could easily reduce the size of this large group with odd shots on each side.

Last weekend the writer watched this happen.  The shooter was distraught and no amount of encouragement was able to get him to accept the evidence on the Hex System screen. All he could see was a flattened group. The causes were clearly shown in the shooter’s sub-groups.  What was most confusing was the mix of shots eventually confirmed to be due to both:

* the tremor effect
* unwanted tensions of the hand on the pistol grip.

The shooter’s TR shot pattern clearly contained a 0.5 MOA sub-group within the centre of the V-bull, together with a 1.5 MOA sub-group centred at 3 o’clock in the bullseye ring. A further 0.8 MOA sub-group centred at 9 o’clock on the outer edge of the bullseye ring did not make sense. The shooter knew that the tremor effect for a RH shooter often consisted of a surrounding ring of bullseyes and inners, with sub-groups in the centre and on the right. The tremor effect did not often result in a sub-group in the bullseye ring at 9 o’clock, much less sub-groups on each side of the bullseye.

The same shooter’s F Class shot pattern contained several shots within the 0.5 MOA X-ring, with a sub-group on each side: a 1.0 MOA sub-group centred at 3 o’clock in the bullseye ring and several shots in a 1.0 MOA sub-group at 9 o’clock within the bullseye. As well, there were several shots scattered around the perimeter of the bullseye ring.

The tremor effect is most often observed as a circular pattern of shots around the perimeter of the bullseye or inner ring, often accompanied by a 1 MOA sub-group centred at 3 or 4 o’clock near the perimeter of the bullseye ring.

This article describes the distinction between two factors which may occur at the same time and result in both 9 and 3 o’clock sub-groups. Other patterns which consist of sub-groups aligned vertically and which commonly appear in TR shooting (although not unknown to F Class shooters), are the subject of another article.

**Discussion:**   routine analysis each week by a coach, of the shoots of a club of 20 or more members, will provide the experience needed to identify the types of groups produced. A club coach may in this way diagnose and suggest cures for each member’s technique difficulties.  A club coach may routinely recognize when a TR shooter’s rifle is not being supported dead still, the sling is loose or changes occurred in the natural point of aim.

It is usual for a shooter to simultaneously experience difficulties due to more than one technique problem. A group coach could become the preferred way to assist club members to master those techniques which shooters do not recognise. The shooter is just as likely to experience another very common difficulty, due to incorrect tensions of fingers and the palm on the pistol grip. Both TR and F Class shooters commonly experience these multiple factors at the same time. Whereas, horizontally aligned sub-groups commonly occur when a shooter experiences both the tremor effect and changes in tensions of the hand on the pistol grip. As noted above the tremor effect is characterized by a small central sub-group within the X-ring or V-bull, often with a further sub-group at 3 or 4 o’clock near the bullseye-inner line. A left-handed shooter experiences this sub-group at 9 o’clock.

Note that when asked about the most common source of difficulties experienced by rifle shooters, Perce Pavey, asserted that the hand on the pistol grip was responsible.

A TR shooter who has mastered the tremor effect will typically score a high number of V-bulls. There is little sign of surrounding bullseyes, inners or of the 3 to 4 o’clock sub-group centred upon the bullseye boundary. In the same way, a skilled F Class shooter scores a high number of shots in the X-ring, with a small number surrounding the 6-ring or just over the line into the bullseye.

On the other hand, variations in tension of the loading hand upon returning to the pistol grip, will often lead a TR or F Class shooter to find that a 1.0 MOA sub-group appears at both 9 and 3 o’clock, as far out as the inner-magpie line. If tension is increased after the previous shot, a RH shooter will find it will appear at 3 o’clock. If decreased, the shot will appear at 9 o’clock. A LH shooter will experience the reverse.

Note that it is unusual for a shooter to be able to avoid tremor shots and still produce a hand tension group. Most fullbore shooters experience the tremor effect. However, a shooter who has worked hard at mastering the tremor effect, will find it much easier to also master variations in hand tension. Hence, it is more usual for shooters to eradicate sub-groups on each side of the bullseye, or fail in this and still experience a sub-group on each side. Note that a smallbore shooter who shoots on a fullbore range, may show no indication of either tremors or hand tension shots. Smallbore shooters usually master the trigger-release technique early, upon a coach helping him/her master a list of expected difficulties.

**Practical:**for a RH fullbore shooter the initial finding upon mastery of the tremor effect, is to experience a central group accompanied by a sub-group at 9 o’clock. The coach would alert him/her that the tremor effect will commonly result in a sub-group at 3 o’clock. The 9 o’clock sub-group will be a mystery. The coach will however, instantly recognise the 9 o’clock shot as arising from a further technique difficulty, e.g. variability in hand tensions after loading each shot.

If a club coach is available, then a combination of technique difficulties can be immediately identified.  The shooter will then be able to quickly master both sources of difficulty. Many shooters silently incur a difficulty for months, until shown.

**Conclusion:**   more than 90 percent of shooters suffer from the tremor effect due to a poor trigger-release technique. However, when the reloading hand is also returned to the pistol grip with varying tension, the effects of both difficulties appear. If a club does not have a coach, who can diagnose each shooter’s groups and then suggest a cure, shooters will continue to remain unaware of the simultaneous techniques they need to master.

Shooters need to recognise these two types of difficulty and avoid a further error, which results upon altering the sight for a shot at 9 or 3 o’clock. Simply overcoming a tremor or a change in tension is far easier.

Best regards

Geoff