Dear Colleagues

**Group changes due to bodily contacts and the absorption of recoil**

**Problem:**every rifle shooter experiences stray shots well out of a group, which result from parts of the body in contact with the rifle. Some of the contacts appear to oppose the rearward movement of the rifle, e.g. when the thumb is wrapped around the rear of the action or when the thumb is in the hole of a thumb-hole stock. Other contacts concern the use of the trigger finger, which can cease its very carefully controlled pull, upon the shooter’s mind starting to think about looking at the screen to see where the shot went, i.e. before it has been released!

In the 19thCentury when Match Rifle began, fired today over 900x to 1200x on Stickledown Range Bisley, using telescopic sights and alternative positions other than prone, the techniques described here to avoid recoil effects were routinely utilised. The physics of rifle recoil was well understood. Match Rifle was also pursued at greater distances throughout Scotland and on islands of the Western Isles. As well, it was practised at the Dean Range, Adelaide, where the site of the 2000x firing point is today a pub at Port Adelaide.

The vast majority of rifle shooters experience widening of a group as a result of unintended absorption of recoil by the hand in contact with the pistol grip. Much of the damage results from slight changes by each of the components of the body in contact with the rifle.

Shooters appear largely unaware of each of the different effects upon a group which occur due to the unintended absorption of recoil. Leading shooters are however aware that when a 0.5 MOA (the size of the X-ring) group is not being achieved, then a need exists to re-examine where and in which direction bodily contact may be occurring. Shooters experiment and adjust the direction and tension at a point of contact, which can instantly change the appearance of a group, from a jagged 2 MOA (bullseye) to a round 0.5 (X-ring) or 1.0 MOA.

**Discussion:**it is self-evident, when fullbore shooters (RH) fit a hand-stop to their rifle stock, as if they are shooting smallbore, that the resulting high-left to low-right group results directly from this ill-advised decision. When told this, many find they have developed a dependency for this item of equipment. F Class shooters look on and are reminded that this as one of the reasons why they changed from TR!

Most shooters understand that recoil needs to be absorbed by the shoulder. This leads them to ensure the butt-plate makes a good contact, fitting tightly and in exactly the same place on the shoulder. They know when they have got this right, because the recoiling stock ceases to slip back across the forward hand. However, there are some shooters who use the butt-plate in this way and succeed in ensuring that the hand-stop does not result in a diagonal group. These shooters are very careful when placing the forward hand against the hand-stop, that the tension against the shoulder is equal to or greater than against the hand-stop.

TR shooters should be grateful to those who pursue F Class, because the hand in contact with the pistol grip is the source of many unwanted tensions due to recoil. Perce Pavey often stated that many poor shots originate from the way the shooter holds the pistol grip. He considered the pistol grip was the feature of a rifle which required the most demanding set of techniques. In .303 days shooters were unable to consider F Class as a means of comparing their hand position and tensions. However, Perce had considerable insight and when coaching a shooter, would ask him to try his hand in another position to see the effect this had upon a group.

The clearest illustration was the absorption of recoil by the thumb. If it were wrapped around the rear of the pistol grip, so as to absorb some of the recoil that would go to the shoulder, this would send shots toward 7 o’clock for a RH shooter. A LH shooter would find shots going toward 4 o’clock. So when using a thumb-hole stock constructed with a neat little hole, open it right out with a large round-tail file. The writer preferred to loosely place the thumb around the pistol grip. Others put it to the side of the stock.

There is a lot that can be written about experimentally devising and re-setting the position and tensions of the hand on the pistol grip. To summarise, ensure that no fingers push in a forward or sideways direction to the movement of recoil. The trigger finger needs to pull on the first joint, i.e. without compressing muscles that cover either of the first two segments. The index fingermustbe anchored to the woodwork by the large adjacent muscle on the palm of the hand. The handmustbe firmly anchored to the grip by the two largest muscles at the rear of the hand. The remaining three fingers should be firmly but not tightly against the grip, so they may position the hand in the same place and angle to the trigger. When reloading, the hand must be returned to the grip with exactly the same position and tensions. If tighter for some shots, then a RH shooter will send those shots over the bullseye line at 3 o’clock. If tension is lighter then shots will go toward 9 o’clock. Note that these sideways shots are indistinguishable from wind shots. Upon devising a better arrangement of finger tensions and directions, be prepared to repeat this within a few weeks, because one’s biology concerning muscle tissues tends to change and interfere.

In F Class, some shooters choose to minimise the hand on the pistol grip by pinching the trigger against the trigger-guard. This is at first found to be a way of overcoming all the problems with the hand-grip. It leads a shooter to believe he has made an important discovery. However, an initial 60.8 soon becomes harder and harder to repeat as the shooter finds it hard to apply the quick initial pull, then change to a very slow pull closer to the point of release. In this, the mind must remain on the very slow step (only 2 to 3 seconds longer), i.e. to prevent the brain jumping ahead too soon to the next task, such as reloading or turning the head to look at the screen.

One of the most valuable techniques is when F Class shooters allow the rifle to recoil entirely without contact with the shooter. The scope needs to be re-set to avoid do-it-yourself brain surgery. The rest needs to be carefully lubricated to achieve a controlled and even slide. Here, the only part of the shooter in contact with the rifle is the hand that pulls the trigger

**Practical: l**eading shooters are aware of factors which affect the size and shape of the group. A group is thought of as resulting from good or poor management of recoil. Group changes that shooters seek to remedy are: increase in size, change in shape, holes in the group, splitting into 2 or more sub-groups, a hollow group, a halo of shots above or below the bullseye and a line of shots tangential to the circular line of the V-bull (6-ring) or bullseye. Shooters frequently attribute the well-known multiple group (a 1.0 MOA central sub-group surrounded by a 1.5 to 2.5 MOA in TR; a 0.5 MOA central sub-group accompanied by a 1.0 to 2.5 MOA in F Class), which is either concentric or two entirely separate groups, usually in the centre of the V-bull or 6-ring with another near the bullseye line in any direction.

The writer considers the most effective technique is employed by women, who have proven ability to very gently pull the trigger fast at first, then more slowly as they think of the point of release approaching. Upon suggesting to women shooters that they may overcome many of the effects of recoil, otherwise absorbed by the shoulder, they readily adopt the concept of the rifle recoiling against nothing (except friction of the slide on the rest). Then, using gentle control available from a sensitive hand, these women continue to prove they have their advantage over other shooters. The writer has wondered whether their gentle-hand technique is both a means of controlling unwanted recoil effects, while using follow-through and at the same time, avoiding the generation of tremors.

**Conclusion:**recoil needs to be re-thought 160 years after rifle shooting was offered as a challenge to the nation. Until F Class appeared most TR shooters thought little about recoil and the precautions they should take. Today, TR shooters in Australia and New Zealand are increasingly achieving the same 0.5 MOA group as F Class shooters!

Best regards

Geoff