CHAPTER 17
CANT

In an earlier chapter you were advised to shoot with the rifle canted towards you to keep your head level. It's essential for 3-positional shooters to do that to retain balance, and while balance isnt quite so important to the prone shooter, you still need to keep your head and eyes level.

You use your eyes to tell you where you are in relation to other objects; you also use your sense of touch and feel as well, but when you're standing up your only contact with *terra firma* is through your feet, and the muscles in your feet and legs perform wonderful little push-pull exercises to keep you upright.

If you suddenly see the ground rushing up at you, you know you're falling over, but if it's dark or you have your eyes closed, something else comes into play, i.e. the semicircular canals in your ears.

Strictly speaking these aren't actually 'canals', they're more like little half-circle tubes interwoven with each other in three different planes. The insides of the tubes are covered with thousands of tiny hairs, and the tubes are half-filled with liquid.

While you keep your head upright, everything is in balance, but when you tilt your head over to one side (or, indeed, start to fall over), the liquid moves around the tubes and covers different sets of hairs, which immediately send out messages to tell your brain you're falling over.

If you've deliberately tilted your head to one side, then your brain wants to ignore these signals. However, it can't just switch them off and there are messages flying backwards and forwards up and down your nervous system while your muscles try to react and straighten you up; so your brain says "no, I want my head on one side" but your ears are telling you you're falling over.

All this is going on while you're trying to concentrate on getting a good score.

Standing shooters (whether rifle or pistol) know that, if they put their head on one side to look through the sights, they sway very slightly from side to side, which is not a good idea.

Prone shooters hugging the ground are unlikely to sway, but that doesn't stop all those messages flying around if the head isn't upright.

Every type of rifle has one basic fundamental design fault: you have to put it in your shoulder in order to fire, and your shoulder is off to one side of your body, rather than directly under your shooting eye.

Canting the rifle keeps your head upright

So, with rifle sights mounted vertically above your barrel, you have to move your head over in order to see through them; of course, you *should* cant the rifle towards you to a greater or lesser degree, depending on your physical size and shape.

The idea of canting a rifle is strictly taboo in the full-bore field, but with smallbore shooting there aren't quite the same problems.

Some people are reluctant to cant because they're concerned about the effect it would have on their windage and elevation adjustments, but put your mind at rest - very rarely are you able to move exactly vertically or horizontally on a target by only winding one knob on the sights. More often than not, the centre of the group requires both elevation and windage adjustments to move it into the bull.

There are twice as many positions on the clock face which *aren't* exactly vertical or horizontal (i.e. 9 - 3 or 12 - 6), and most people find that, if they wind their sights up from 50 yards to 100 yards, even with the rifle perfectly upright they have to make some windage adjustment.

So, if you do cant there are just as many positions on the clock face which would require the manipulation of two knobs.

For example, supposing you shoot with no cant and your shot lands in the 'nine' ring at 9 o'clock, then you would just move across the appropriate number of clicks on the windage knob.

But supposing you shoot with quite a pronounced a cant and you know that if a shot lands at 8 o'clock in the 'nine' ring, you only have to adjust the windage knob. Everything works in the same way, it's just moved around slightly, and once you've settled down with a consistent cant, you make the necessary alterations almost instinctively.

In case anyone is wondering why we don't just use offset sights instead of canting, well that would move the centre line of the sights a lot further away from the centre line of the barrel, which would certainly *not* be a step in the right direction. There are now some sight-raising blocks available from the *Anschutz* and *Centra* factories that do have a small offset - about 10mm or so - which would help with the amount of cant but wouldn't eliminate it entirely.

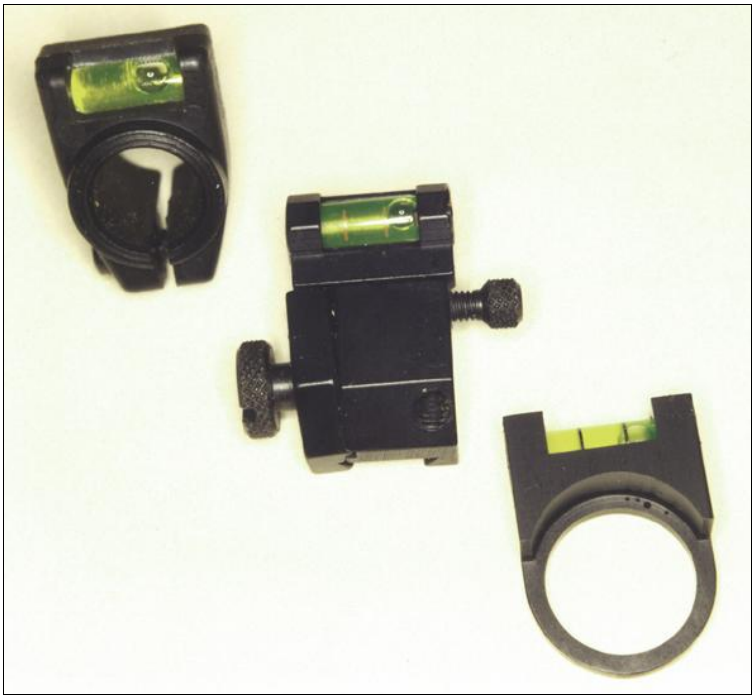
Another reason given for not canting your rifle is that it's more difficult to judge the angle of the cross bars on your foresight elements than it is to keep them horizontal. That, of course, is very true, but if you shoot with plastic elements you won't have any cross bars anyway.

The latest *Anschutz* foresights have a cantable facility built in so you can rotate the tunnel to combat your cant, ensuring that the built-in levelling bars appear horizontal; there's even a small scale on the side to use as a reference point if you're using different amounts of cant for different positions.

Any builder will tell you that if you want to get something level, you use a spirit level and yes, of course, there are a variety of these available to fit target rifles.

Most of them attach in some way or another to the foresight; one actually fits right inside the foresight tunnel itself (actually brought out for the *Anschutz* 1900 and 2000 series rifles, although it will fit any of the *Anschutz* tunnels which are threaded at both ends). It screws into the tunnel and then can be adjusted for whatever level of cant you wish.

The original *Anschutz* level used to clamp inside the foresight tube, although the bubble itself sat on top of the foresight. It was held in place by a screw fixing, and the bubble could be seen through a window at the top, with a peg marking the centre.



Bubbles to help keep your cant consistent

If you have one of the older *Anschutz* foresight tunnels which is only threaded at one end, you don't have a lot of choice in the matter - this is one of the few 'bubble' options open to you. Unfortunately, they are no longer manufactured, so it means looking out for something secondhand.

Although the screw-in type does interfere with the sight picture to a small extent, it's even possible the clamping arrangement of the original bubble mentioned above can be seen inside the tube.

Alternatively, there are other bubbles available, which are held in place by the screw-in end cap which holds the foresight elements in place - nothing shows inside the tube and the bubble appears immediately above the foresight tunnel.

Should you dislike the idea of looking up in order to see your bubble, you may prefer one which is designed to be mounted on the receiver (the middle item in the above photo). This puts it below the foresight, within your field of view, and it doesn't interfere with the sight picture.The level itself can be adjusted while you're in the firing position because it has a small knob on the side which, by using a clever little wormgear system, alters the angle of the bubble.

Therefore, if you get down on a firing point that slopes at a different angle to your home range (or even one which changes its angle of slope the further along it you go - i.e. Bisley), you can alter the bubble while you're actually in the firing position. There is also a locking screw which fixes it permanently in any position you choose.

It does have its drawbacks, however; the first one is that, if you have your rearsight a long way forward you can't actually see the levelling bubble, particularly if you have a low position. However, that's not too much of a disaster if you have a rifle with scope-mounting blocks on the barrel because, with a slight modification, it can be fitted to one of these. All that's necessary is a thin brass shim which will compensate for the fact that the receiver dovetail is wider than the scope-mounting blocks.

The other drawback is that it is very, very sensitive. Small adjustments in the level of cant send the bubble from on end of the tube to the other without stopping in the middle. However, being able to adjust it while in the shooting position is a great asset and may well outweigh the drawbacks. You will have to make up your own mind, but try to borrow one before you commit yourself, because they are fairly expensive.

If you don't find any of the above suitable for your needs, a trip to a good tool shop should produce some small replacement spirit level bubbles which, for £1 or so, could mean that you, with the help of some *Araldite* or similar, can design your own custom-built bubble in just the position you want.

If you decide to take this path, then take a tip - buy two!

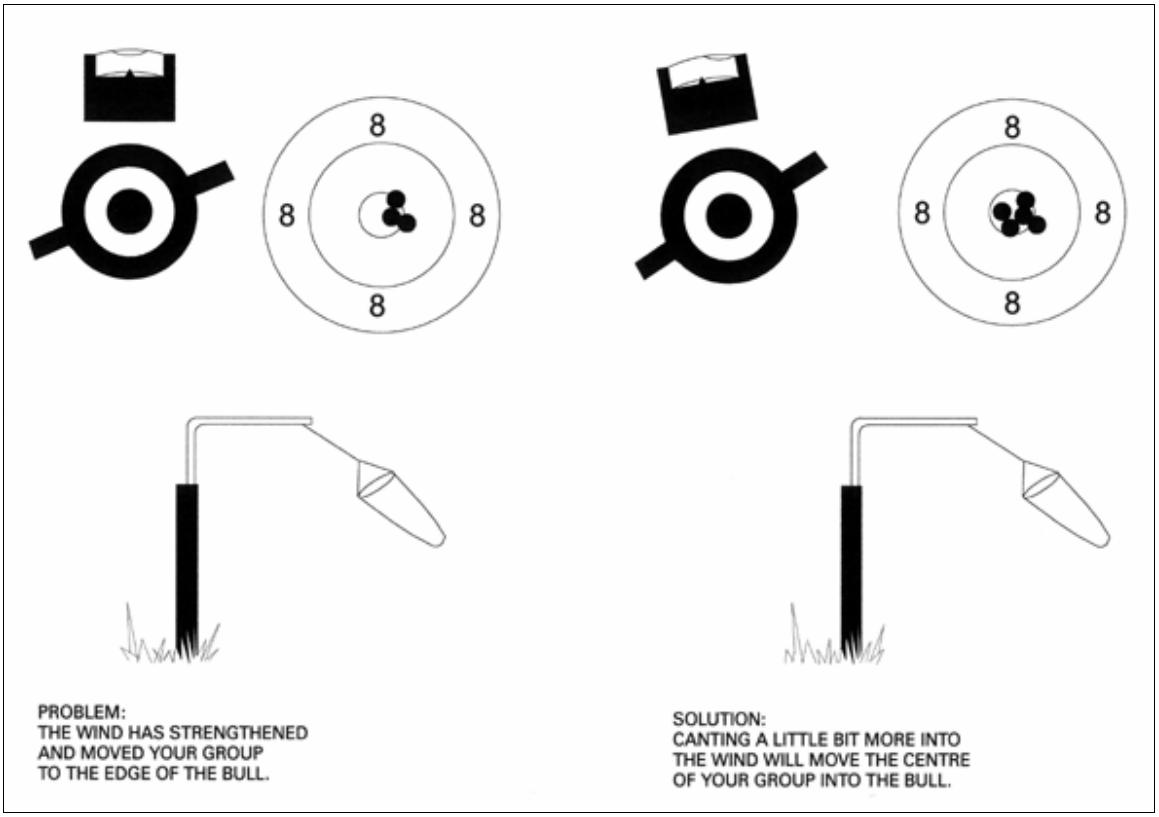
Temporarily fix one with *Blu-tak* to the edge of the sight block or foresight which you intend to use, and shoot with it a few times. *Blu-tak* will enable you to adjust it until you get it at the right angle then, with the rifle on a table, all you have to do is get the two bubbles at the same angle and fix the second one permanently in place. You can then keep the first one as a spare.

Please don't attach it directly to the barrel - smallbore rifle barrels have harmonics and vibrations which could be dramatically upset by something like that.

Whichever bubble system you choose, it can also be a help in a number of other ways, apart from telling you whether your cant is at the right angle and making sure you keep it consistent.

If you reload by lifting your right elbow off the ground (left elbow for left-handers), a bubble comes in useful when returning your elbow to the ground. If the bubble doesn't return to the right place, you know that you've put your elbow down in the wrong place, and you can get back to your correct position by positioning the aiming mark in the middle of the foresight and ensuring the bubble is correct.

Also, if you were reading the chapters about wind and how to shoot in it, you'll know that one of the methods mentioned was to use varying degrees of cant to combat certain wind conditions, such as canting into the wind. That's almost impossible without some means of measuring the varying degrees necessary.



Canting into the wind

With a levelling bubble, it's easy - you could even put extra markings on its glass. Some levels have two marks, which means you can ease the bubble to one side or the other of these marks to get the degree necessary to allow for a particular wind condition.

It you find the idea of having to keep looking at something else other than the target difficult, then you'll have to get used to it; after all, shooting is all about awareness of the prevailing conditions and that includes angle of cant as well as wind flags, mirage, etc.

Don't ask how top shooters manage to shoot as well as they do unless you're prepared to put in the same amount of work as them - these words make it easier for you by giving you some clues on how it's done, but the rest is up to you.