



Muscle memory and flying

It is always good to receive feedback from readers of *The Learning Curve*. PC was a millennium learner and suggested an article on what he called 'muscle memory'. That is not the normal scientific term, but it is quite a graphic way of describing 'doing skills' as opposed to 'thinking skills'.

To put this in context, a ringer must develop:

- Cognitive (thinking) skills, for example understanding the concept of a blue line, being aware of place bells and course bells, and of course learning methods

- Perceptual (detecting) skills, for example ropesight and listening

- Physical (doing) skills needed make the bell do what you want, when you want it

This third group need what PC calls 'muscle memory' (or 'sensory-motor' skills).

The Red Arrows

PC also made a comparison with the Red Arrows. They don't just turn up, climb into the aircraft and then decide what to do. They prepare extensively, mentally practising every new routine many times before ever taking to the air. He wondered whether a similar approach would help to develop ringing skills.

There are some good analogies between flying an aerial display and ringing a method. In both, the performers use skills at all three levels. At the cognitive level, the pilot thinks about the overall performance, the sequence of events and the next manoeuvre, like a synchronised barrel roll. For a ringer, this would be knowing the method you are ringing, where you are in it and planning the next dodge.

At the perceptual level, the pilot must be aware of how the aircraft relates to the world and the other aircraft. As a ringer, you must relate what your bell is doing to what the others are doing, using a combination of ropesight for orientation and listening to check the striking.

At the physical level, the pilot senses the movement of the aircraft, and uses co-ordinated action on the controls, for example to pull out of a dive just hard enough to reach the right altitude. This exactly parallels a ringer's need to lead accurately after hunting down. You feel what the bell is doing and apply the right force at the right time to make it do what you want.

Learning lessons

At the highest level, ringers could well try to emulate the diligence put into learning and planning a flying display. In ringing terms, that would mean every ringer learning the method thoroughly, and also learning the composition and how it affects them. Many conductors mentally call the composition in their heads on their way to ring a peal or quarter peal. How many of the rest of the band do so, or even mentally ring the method a few times?

At the perceptual and physical levels, things

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become more interesting, and the comparison is less straightforward. The Red Arrows translated into ringing terms, would be an elite band - probably unbeatable in striking competitions.

When people first learn to fly they learn how the aircraft works - basic aerodynamics, what causes a stall, and so on. This understanding helps develop the physical skill.

Doing everything at once

Controlling a bell is all about speed control. There are three basic speeds, corresponding to hunting up, hunting down and making places, but things are not that simple. Your action on the rope relates to the change in speed, not just to the speed itself. As well as ringing 'this' stroke, you must prepare for what the bell needs to do at the next stroke. For example, in plain hunt, moving from 4ths to 3rds place is a different action from moving from 2nds to 1st place. In the first case the following stroke is at the same speed (hunting down) but in the other the following stroke is slower (because the lead is at normal rounds speed). Hunting down before a dodge is different yet again, because of the even bigger speed change on the following over-blow.

As well as preparing for the next stroke, you also have to adjust slightly in response to what you were doing at the previous stroke. Combining the effect of all these factors gives 27 slightly different actions (3x3x3). Figure 1a shows the blue line fragments corresponding to these actions. In each case, 'this' stroke is shown thick, and the preceding and following strokes are shown thin.

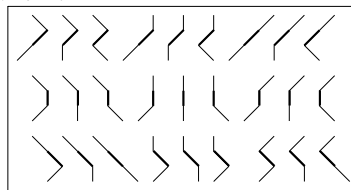


Figure 1: 27 different stroke actions

The physical actions corresponding to these manoeuvres involve combinations of:

- Checking more or less on the rising stroke
- Pulling more or less on the down stroke
- (Pausing more or less over the balance)

The last one is in brackets, because on some bells, notably round the back end, your bell does not normally go much beyond the balance point.

The overall balance between how much you check and how much you pull determines the speed change. In Figure 1, the speed change is the angle the line turns through in the diagrams. Checking more makes the line turn clockwise and pulling more makes it turn anti clockwise.

Checking and pulling together does not affect the overall speed change, but can advance or retard an individual blow. You need to do that to strike it in the right place at the right time. If you don't do that, the line is curved - every time you cut a corner, you miss your place and clip another bell.

The most effective way to vary the position of an individual blow is not by just applying more force, but by subtle variations in the timing of the force, to vary how far the bell rises. Delaying the force on the rise lets the bell rise higher, which delays the next blow. Applying a similar force early in the rise stops it going so high, which advances the next blow.

Hand and back

To ring open handstrokes, you must allow for the regular alternation of quick backstrokes and

slow handstrokes. You can think of it as a continuous half-place dodge going on all the time in the background, as shown in Figure 2a, superimposed on everything else. How it affects the patterns above, varies with the stroke you are on. Figure 2b shows the effect on dodging down (upper as Plain Bob, lower as Grandsire). Figure 2c shows the effect on lying behind (upper as Plain Bob Minor, lower as Plain Bob Doubles). For comparison, Figure 2d and e show the cartwheel equivalents. Notice the difference in size between the two dodges.

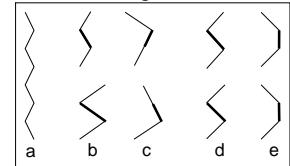


Figure 2: (a) Open handstroke rhythm (b) Effects on dodge (c) Effects on place

Allowing for this effect doubles the number of different actions to 54. You could produce a table containing descriptions of what to do for each of these different cases, but it would be impossible to memorise them.

Balancing handstroke against backstroke has a final twist. On most bells, the weight of the rope closes the backstrokes a little with no effort from you. An odd struck bell (and there are lots of them around) either adds to this effect, possibly closing the backstrokes more than you need, or it might make the problem worse by closing the handstroke.

Putting it together

By now, you probably realise just how complex accurately controlling a bell is - if you think about it. Don't let that put you off. While ringing, there is not time to think about it, so you must do things by feel. To do that, you must practise, to learn the feel of these basic actions. Only then can you ring rhythmically, which is the only way to strike well.

The fixed factors (the hand-back rhythm and how to achieve it) depend on the individual bell, so while settling in to the rounds at the start of a touch you must 'learn' the hand-back feel and impose that over the rest of the touch. Since the hand-back rhythm also depends on the number of bells, you must take particular care when ringing on more or fewer bells than normal.

The planned factors (hunting, dodging, etc) are rhythmic patterns (as in Figure 1) that you must learn and practise in advance. Make sure that whenever you ring, you are trying to feel the effect of the different rhythms. Don't waste valuable time on the rope just yanking the bell around to follow another rope. These rhythms too are scaled bigger or smaller depending on the number of bells, so you must allow for that.

With the fixed and planned factors under control, you can focus on the reactive factors (correcting and adjusting). As the bell rises, you can compare what you expect it to feel like, with what it is actually doing, and correct as necessary.

For all your actions (fixed, planned or reactive) you need to make judgements about 'how much'. It is not enough to 'pull in' or 'hold up', you need to judge how much force to apply when pulling in, how far or for how long to hold up, and so on. These are not intellectual or numerical judgements, you have to know what they feel like. You can't throw a ball into a bucket by rules and numbers, and the same is true of striking a bell.

Tail End