The Learning Curve

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Know your instrument - 1

Most musicians need to know something about how their instruments work. With some, the working is very visible – for example the movement of the trombone slide or the position of the violinist's fingers on the strings. In others, like an organ or piano, it is largely hidden (though every pianist must have opened the lid and looked at the strings and hammers and levers within). In many cases, musicians need to allow for their instrument's inherent shortcomings. For example, a brass player must recognise the accumulation of condensation in the tubes, and know when to empty it, and a woodwind player must recognise when the reed becomes worn and be able to fit and adjust a new one.

What do ringers need to know about their instruments? In many ways we have it easy – no reeds or crooks to adjust, and only one note to play – but in others we have it far harder than most musicians, because of the complex dynamics of the bell and the rope. Recent e-mail discussion between members of the *Network for Ringing Training* highlighted the benefit of understanding some of the hidden workings of the bell. So this month we look at some aspects of how a bell works, whose understanding can help you to make it perform properly, ie to produce good striking.

Time delay

The time delay between the decisive action and the resultant sound of a tower bell is far more than for almost any other musical instrument. (I say almost any, having once witnessed a frustrated musician acting as the link between the conductor of the 1812 overture and the officer who had to give the order to the soldier who fired the cannon – for each shot!)

Typically, the bell strikes on the rise to the following stroke, see Figure 1(e), about a second and a half after you pull it off. This delay detaches cause from effect when you ring it. The part of your brain deciding about the timing of your action is active at a different time from that part of your brain checking whether you got the timing right. Learning to link these two things effectively can be a big step, though some ringers manage to make it intuitively.

The best way to help new ringers build this delay into their automatic thinking is to expose them to it early, when their ringing skills are still in a formative stage. Learning on an untied bell, or a bell with the sound simulated, enables them to do this naturally from the start. If for any reason you can't provide this experience for the early bell handling stages, then at least try to provide it before pitching them into the confusion of ringing with lots of bells sounding.

There is a simple test for whether you have learned this relationship. Ring the bell and say 'dong' at the moment when the clapper strikes. It is impossible to 'cheat', because the inevitable delay in response is very obvious to anyone watching you.

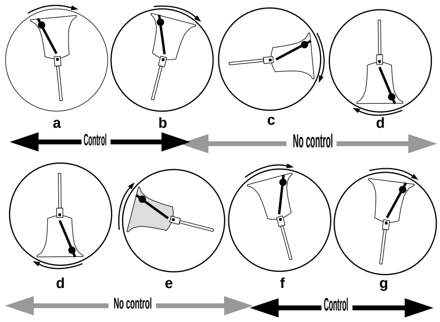

Figure 1: Delay between pull-off and strike

Rope - sound relationship

All bells have a delay, but it's not necessarily the same for them all. This causes problems when your mind is exposed to both visual and audible stimuli, as it is in normal ringing. Ropesight tells you what is going on around you. It is valuable for keeping right and reminding yourself what to do next, but the visual signals, and in particular the rope movement of the bell you are following, can override what your brain should be telling you on the basis of what you hear. The visual signal has no delay, which gives it an unfair advantage.

The delay of the sound compared to the rope movement tends to increase with the weight of the bell. If you don't expect this, you will continually find that your eyes are encouraging you to ring too close when you ring a little bell or too wide when you ring a big bell. When you know what to expect, it is easier to suppress the misleading visual cues.

Odd struckness

This is a particularly pernicious case of variability - a different delay between handstroke and backstroke of the same bell. If a perfect bell swings evenly between handstroke and backstroke, then the time interval of the sound going from handstroke to backstroke is the same as when going from backstroke to handstroke. In an odd struck bell the intervals are different, as shown in Figure 2.

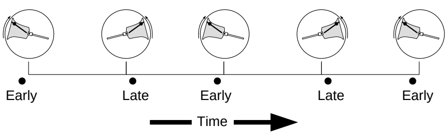

Figure 2: Odd struck timing

You will occasionally meet odd struck bells, and you need to know how to cope with them. You might find that you compensate for mild odd struckness without being aware of it, just by listening and adapting, but more severe cases need deliberate action. First work out whether it is late at handstroke and early at backstroke, or the other way round. Then you have to alter the way that the bell swings in order to make it strike evenly, ie you need to ring with a deliberately uneven hand-back rhythm. This is harder than adapting to a bell with a slightly different delay between rope movement and sound, and it can be frustrating when you have learnt to ring evenly. Having got the measure of how odd struck the bell is, and biassed your action accordingly, you have to keep imposing the uneven rhythm over the top of everything else that you do – hunting up and down, dodging, etc. You will find that dodges in one direction feel smaller, while dodges in the other direction feel bigger. For example, if the bell strikes too wide at backstroke, dodges up in Plain Bob will need more effort, and dodges down will need less, than they would otherwise.

You need to remain alert. If you don't quite correct for the odd struckness, and you hear yourself strike late at one stroke, then 'correcting' the next stroke (in the opposite direction) makes matters worse. Use the Rounds to get the measure of which way, and by how much, your bell is odd struck. Trying to work it out after going into changes is much harder – it gets mixed up with other errors.

Some people find it easier to cope with a bell that is wide at back and close at hand, because the corrective action – keeping backstrokes in and handstrokes off – is merely an exaggerated version of the normal action needed to ring with open handstroke leads. In contrast, to correct a bell that is odd struck the other way, you have to develop an action that is opposite to the normal.

Bells become odd struck because something does not align correctly (the axis of the bell, the headstock pivot and the clapper suspension point). Modern headstocks are often fitted with 'twiddle pins'. As shown in Figure 3, these enable the clapper pivot to be moved a short way, to compensate for odd struckness.

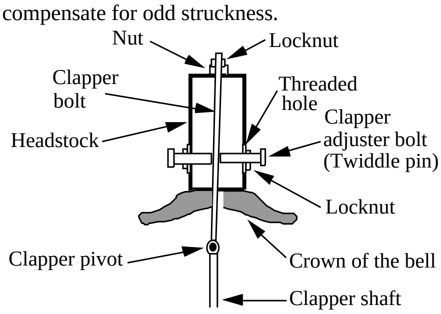

Figure 3: Twiddle pins

Momentum and energy

The sheer mass we have to control when ringing sets us apart from other musicians. The inertia of moving parts is a minor complication with most instruments, but it is the dominant factor with a tower bell.

The time between successive strokes depends on how high the bell swings, and to change that you have to put in, or remove, significant amounts of energy – especially on heavier bells. You can't instantly change the speed (especially if you want to do it accurately) so you need to plan ahead at least one blow (and on a heavy bell more) co-ordinating the balance between your pulling (force on the down stroke) and checking (force on the up stroke) and adjusting the rope length as required to do it comfortably and accurately. Having thus set up your bell to be in roughly the right position, you can then feel exactly what it is doing in order to apply the final fine tuning (and prepare it for the following stroke).

There is more ...

Space limits what we can cover in one page. A future *Learning Curve* article will look at other aspects of the bell as an instrument that affect the way you need to ring it, focusing in particular on the rope and its behaviour.

Tail End

Information about the *Network for Ringing Training*, is on the CC Education Committee web site: http://www.cccbr.org.uk/ then follow links to - CC committees - Education.

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