Fitting in

This is one of a series of notes contributing to our focus on striking. It was written in response to something that happened during ringing, which generated two contrasting views about which bell should move to close a gap. This note seeks to combine both to give a more complete explanation.

For good striking, each bell must fit perfectly with the others. But when the striking isn't even, it isn't always clear which bells should move and which should stay put? What might seem the 'obvious' adjustment may not get the striking closer to perfection. Let's consider an example.

If there is a big gap before the Tenor, is the Tenor wide, or is everyone else close? Two common, and extreme, arguments are:

1 I'm the Tenor. The others should take their pace from me, and fit round me, because the Tenor is big and heavy.

2 If a bell doesn't fit in, then it must be wrong, because the majority can't be wrong. The rest of us are following the bell in front, so the Tenor should do the same.

Both have a grain of truth, both are overstated, and both miss some subtle but critical factors.

Steady ringing

What follows relates to steady ringing, where the intervals between adjacent bells are not all the same, but where more or less the same rhythmic pattern repeats row after row. Choppy ringing, where the intervals vary from row to row, raises different issues, not discussed here.

At any given ringing speed there is a 'correct' interval between bells. It is not set by the whim (or the skill) of any one ringer, but is the period of swing divided by the number of bells. For open handstroke ringing the interval is the period of two swings divided by twice the number of bells plus one, but for simplicity we will ignore the handstroke gap, which doesn't alter the principles, but makes things more complicated to explain.

All examples below assume ringing at 30 rows per minute, so each row takes 2s, and the correct interval for 8-bell ringing is 0.25s (2 / 8).

Example A

Suppose that the intervals between bells 1-7 are all 0.23s, and the intervals between 7 and Tenor and between Tenor and Treble are both 0.31s. That is a stable pattern, since the total gaps add up to 2s, but it is not perfect because they are not all even. The Tenor is striking mid way between 7 and Treble, so it is doing the best it can to even out the gaps around it. Contrast that with the 7, which has a 0.23s gap in front of it and a 0.31s gap behind it, or the Treble, which has a similar disparity but in the opposite direction. They are not doing their best to even out the gaps around them, which they should be in order to move towards a more even overall spacing. Bells 2-6 have gaps of 0.23s either side of them, which is smaller than the ideal, but in each case they are striking in the midway between the bells before and after them.

In this situation, the two bells not striking midway between their neighbours, Treble and 7, need to take the lead in evening out the rhythm. Both should move slightly towards the Tenor, the Treble moving a bit earlier, and the 7 moving a bit later. When they do that, 2 and 5 will no longer be in the middle of their gaps, so they too should move very slightly. This process of adjustment will lead to all the gaps being the same.

Example B

Now consider a different scenario. Again there is a 0.31s gap between 7 and Tenor, but the gap between Tenor and Treble is 0.25s, and the gap between bells 1-7 is 0.24. This is also a stable pattern, since the total gaps add up to 2s. The Tenor has the same oversize gap in front of it as in the previous example, but a much smaller gap behind, so it isn't striking equidistant from the bells either side, and should move earlier. But the Tenor isn't the only bell that should move. The 7 still has a bigger between the gap behind than in front, and so it should move later. As before, both of these moves start to reduce the major discontinuity, and spread the signal to make the smaller adjustments needed by the other bells, all of which are very slightly too close to each other.

Moving backwards or forwards?

Both the examples above conclude by stating that a bell (in both cases the 7) should move later as an initial response to the over-size gap after it. That is clearly correct in terms of helping to equalise the gaps either side of it, but it might seem counter intuitive for two reasons.

The effect of the initial move would be to widen the gap between 6 and 7 (say to 0.27s), which would then be wider than the gap between 5 and 6 (still 0.24s). So the 7 would be breaking the otherwise even rhythm between 1, 2, 3, 4, 5 and 6. That means it is not 'following the 6' quite so well as it was. But since the interval between the front 6 bells is incompatible with the speed that the bells are ringing, easing out from the bells that are grouped too closely is preferable to helping to perpetuate a rhythm that does not fit.

Some people see ringing as a process of 'following the bells in front', so the idea of fitting in with the bell behind you alien. But ringing is a cyclic process, governed by the number of bells and the time they take to swing. There is some latitude in the speed of ringing, but it is relatively limited. Consider an extreme example. Suppose that 2, 3, 4, etc chose to follow at an interval of 0.1s., and expected everyone else to do the same, including the Treble following the Tenor. That would require the bells to swing every 0.8s. (75 rows a minute) which is impossible. In practice a huge gap would open between Tenor and Treble, which is not correct, and which sounds awful.

Changing the speed

There is nothing magic about ringing at 30 rows per minute – other speeds are possible. There is usually a fairly narrow range of speeds at which the bells go best, and the ringers are most comfortable. If the speed is outside this comfort range, then the striking is quite likely to be uneven. So if the ringing is too slow, it might be sensible to speed up a bit before trying to even out all the gaps. But speed is not an excuse for ringing too close or too wide. Whatever speed the bells **are actually** ringing, the correct interval is still as described above, and everyone should try to achieve it.

Raising and lowering

When raising and lowering, the speed changes a lot, but the requirement for the time intervals to be evenly shared between all the bells still applies. The swing period gradually changes, and the gap between each pair of adjacent bells should change to match.

Persistent gaps (or clips) are more common when raising and lowering, partly because accurate ringing is more difficult when the bell is part way up. But a common cause of unevenness is a few bells failing to close (or open) the gaps to match the changing overall speed.

Example C

The bells are part way down, ringing at 40 rows per minute. There is a 0.24s gap between 7 and Tenor, a 0.18s gap between Tenor and Treble, and a 0.18s between bells 1 - 7. This is a stable pattern, since the gaps add up to 1.5s. As in example B, the dominant gap is between 7 and Tenor, which share the responsibility for starting to close it, the Tenor by moving earlier and the 7 by holding back slightly. During the lower, this action is more urgent, because as the pace quickens, the gap is likely to get worse. A Tenor of any significant weight is a lot less mobile than the other bells, and if left too high cannot quickly get down to the required level. So the Tenor must move pre-emptively to avoid getting left behind. Equally important is the restraining action of the 7. By holding back, it can help to prevent the other bells rushing down and leaving the Tenor stranded.

Conclusion

All ringing, at whatever speed, is about fitting in, and all the ringers share the responsibility for doing it.

There are occasions when one ringer (eg the Tenor) drifts out of place, and needs to get back into line. But there are also occasions when the smaller bells drift into a huddle, ignoring the need to fit the overall compass and leaving the back bells stranded. The skill is to know which is which, and to act accordingly.