The Learning Curve

A regular feature sponsored by the Central Council Education Committee
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Ringing and numbers - 1

In October and December last year, *The Learning Curve* looked at ways to learn methods. 'Ringing by numbers' wasn't mentioned, but it is something that people often argue strongly about.

Sauce for the goose?

Conventional wisdom says that learning numbers is 'bad' for beginners, but 'good' for conductors and advanced ringers. That sounds terribly elitist, so why should there be a difference? Numbers are fundamental to the concepts of change ringing, so shouldn't we all learn them?

Numbers aren't good or bad in themselves. Sometimes an understanding of the numbers is helpful (or essential) but at other times the numbers can get in the way. It all depends on what you are trying to do with them.

This month we look at some of the things that you can do with the numbers.

Coursing order

The simplest method is plain hunting, as shown in Figure 1 for six bells.

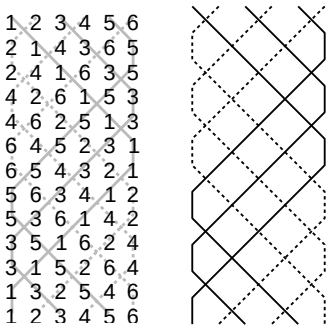

Figure 1: Coursing on six bells

Look at the order in which the bells come to the front. It is 1246531, but Figure 1 is just a snapshot of a process that can go on indefinitely. In fact the sequence repeats cyclically:

...1246531246531246... as long as you like.

Now look at the order in which the bells are on the back. It is the same sequence, though our snapshot starts at a different point:

...6531246531246531...

Having looked at hunting from the 'outside', now look at it from the 'inside'. What does each bell see as it weaves its way through the pattern? Follow the path of the Treble, and notice the order in which it crosses the paths of the other bells: 2465324653. Do the same for another bell, say the 4th: 3126531265. These sequences also repeat if the hunting continues. Look at each, and you see that the order is the same as the order in which the bells come to the back or the front, but with the bell's own number missed out. It never goes through its own path, but you will also see that where its own number would be in the sequence, is where it turns round, lying or leading. Now look at the right hand half of Figure 1. It has the same lines but the numbers removed for clarity, and you should be able to see how the structure of the hunting relates these sequences to each other.

Plain Bob

The first lead of Plain Bob is a plain hunt like Figure 1 until the last change. At that point one bell makes seconds, and the remainder mark time by taking a reverse step and dodging above it, see Figure 2. The lower half of Figure 2 shows how this affects what happens in the following lead.

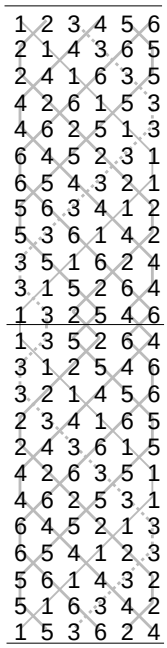

Figure 2: Effect of lead end change in Plain Bob

The Treble meets the bells in the same cyclic order, but sees the bell that makes seconds twice (before and after the lead) so if you count from when the Treble is at lead, this bell jumps forward in the sequence:

...246532465**33**246532465...

What about the other bells? The order in which they meet each other (excluding the Treble for the moment) stays the same:

...24653246532465324653...

and they still turn at the back or front whenever they get to their own number in the sequence.

Where the Treble fits into this pattern changes though. With the other bells all taking a step backwards at the lead end, the Treble gets progressively earlier in the sequence, as shown in Figure 3. This too is cyclic, and the last row is the same as the first, with the Treble appearing between 3 and 2.

...53**1**24653**1**24...
...5**1**324651324...
...**1**5324615324...
....5324165324...
....5321465321 4..
....531246531 24..

Figure 3: Treble within the coursing order

There is a simple relationship between Rounds and this sequence – called the coursing order. It works for any number of bells, and Figure 4 shows it diagrammatically for eight. The rule is 'count down the odd numbers and then count up the even ones'. The Treble is omitted because it moves through the sequence.

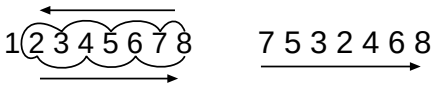

Figure 4: Getting coursing order from Rounds

If there is a call, then the coursing order changes. In January 2004, *The Learning Curve* explained that calls at different leads affect different groups of bells in the coursing order. Most conductors learn which bells are affected where, but you can work it out by thinking about what actually happens at the call. Figure 5 shows the affected bells with dotted lines.

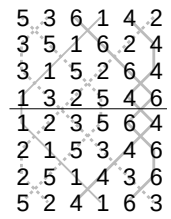

Figure 5: Effect of a bob in Plain Bob

The affected bells are coursing either side of the Treble, so for example a call at the first lead end in Plain Bob affects 5, 3 and 2, and one at the second lead affects 6, 5 and 3 (see first few rows of Figure 3). With these simple rules, you can predict the bells that you will meet in a touch. Conductors do this to check that the ringing is still right, and to correct mistakes.

Other methods

Most methods are based on hunting, but in smaller chunks than in Plain Bob. Often the hunting is chopped into such small pieces that it is hard to see, and also harder to 'see' the coursing order, since the order in which you meet the bells keeps changing. For example, in St Clements, bells in 3rds place and above hunt behind the pair dodging in 1-2. The hunting bells see a coursing order like Plain Bob, but with the dodging bells omitted (they are adjacent in the sequence). Also, with the shorter hunting, they 'overtake' the Treble, making it come later rather than earlier in the sequence at each successive lead – the reverse of Figure 3.

Being aware of the coursing order can tell you a lot about what is happening around you, but for many people, it is a bit too much to think about it all at once. A useful compromise is just to remember your 'course' and 'after' bells – the ones before and after yours in the coursing order – taking note when they change after a call. Figure 2 shows that you meet your course and after bells on the back and at the front in Plain Bob. And if you forget where you are while hunting down, you can 'follow' your course bell to the lead, ie ring two places behind it until you get to the front.

Course bells often work together in complex methods too. For example in Yorkshire Surprise, coursing pairs 'overtake each other' with one making places while the other runs through, and vice versa. So seeing what your course bell is doing can remind you what to do. In methods like Bristol Surprise Major, you spend a while mostly at the back and then a while mostly at the front, during each of which a lot of work is with your course and after bells.

Knowing and doing

There are two complementary aspects to ringing a method: knowing what to do, and being able to do it. You often hear someone say "I know exactly what to do, but in the tower I just can't seem to do it.". This article has been about 'knowing' and in a future article we will look at 'doing' to see how numbers fit in.

Tail End

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