

CHANGE-RINGING DISENTANGLED.

‘Who ryngs thys Belle
Let hym loke welle
To honde, and Hedde, and Herte;
Ye honde for werke,
Ye hedde for wytte,
Ye herte for worshyppe.’

‘We’ll do our best
To call God’s folk to prayer and praise,
To tell their rest.’

Change-Kinging Disentangled:

WITH

HINTS ON THE DIRECTION OF BELFRIES,
ON THE MANAGEMENT OF BELLS,
ETC. ETC. ETC.

BY

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The Book is Dedicated,
BY PERMISSION,
TO THE
REV. HENRY THOMAS ELLACOMBE, M.A., F.S.A.
OF ORIEL COLLEGE, OXFORD,
RECTOR OF CLYST ST. GEORGE, DEVONSHIRE,
MEMBER OF THE ANCIENT SOCIETY OF COLLEGE YOUTHS, LONDON,
IN ACKNOWLEDGMENT
OF MUCH PERSONAL KINDNESS,
AND ALSO OF HIS UNWEARIED EFFORTS
TO RAISE THE TONE AND ASSOCIATIONS OF THE BELFRY,
TO VINDICATE FOR RINGERS THEIR POSITION
AMONG THE OFFICERS,
AND FOR THEIR ART HER PLACE
AMONG THE SERVICES, OF THE CHURCH OF ENGLAND,
BY HIS OBLIGED AND GRATEFUL SERVANT,
WOOLMORE WIGRAM.

TO THE READER.

THIS little book had its origin in a series of papers communicated to *Church Bells*, and subsequently republished. It was then limited to six bells, but dealt with six different systems of ringing. My aim in this Second Edition has been to produce a complete Manual for Beginners. I have, therefore, confined myself now to the two simplest methods of ringing ; I have increased all the explanations very materially, and have extended the work to eight bells.

Others must judge of my success. But I hope and believe that any one wholly ignorant of the subject can learn from the following pages all that a book can teach of simple ringing ; and that he can acquire also the rudiments of conducting. At the same time I do not profess to save my reader all trouble. On the contrary, I warn him beforehand that ringing cannot be learned without considerable pains and attention, both at home and in the tower ; and I stipulate that he deal with any treatise on the subject (whether mine or another) as a student deals with a paper on mathematics, namely, sit down to read the book attentively, and *work out with his own pen* every example given, whether it be printed in full or not.

No man writing on bells at the present day can claim to be absolutely original. I, too, have learned much from others in both the study and

the tower. But this general acknowledgment to those who have gone before me may be sufficient ; because, although yet a learner myself, I reproduce nothing unacknowledged, excepting touches, peals, and such general rules and statements as may be fairly considered, like the formulæ of mathematics, to be public property.

My special thanks are due to Mr. F. W. J. Rees, not only for help in selecting examples and in the labour of preparing for the press, but also for his valuable contributions to my Chapters XVII. and XVIII., without which indeed they could not have appeared in their present form.

I venture to claim for this book four features of its own, viz. ; 'The Tabular Statement of Methods,' slightly altered in this edition in consequence of a remark by Mr. W. Banister ; the explanations of Pricking, in Chapter XVII. ; and of the manner in which Peals are printed in Chapter XVIII. ; to these I have alluded above.

Also the remarks on Towers and on Ringing, &c. in Chapters XXI. and XXII. ; I believe that these will be useful, not only to the Clergy and Churchwardens, but even to Architects. I have had the superintendence of four Church towers ; I have visited many others, both officially and as an amateur, and I know that the subject requires a degree of attention which very few Architects have yet bestowed upon its details. I submitted my manuscript to a first-rate Bell-hanger,

W. W.

HERTFORD,
May, 1880.

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TABULAR STATEMENT

OF THE

METHODS OR SYSTEMS BY WHICH THE CHANGES OF BELLS ARE ARRANGED.

I. METHODS WHICH BELONG PROPERLY TO THE EVEN NUMBERS, ALTHOUGH THEY CAN BE ADAPTED TO THE ODD NUMBERS ALSO :—

THE BOB METHOD, applicable to all numbers from 4 to 12. This branches out into

OXFORD BOB, which commences upon six bells ;

COURT BOB, which also commences upon six bells, is the most divergent from the original stock, and, when applied to eight bells and upwards, is itself subdivided into

LONDON COURT BOB and NORWICH COURT BOB.

In all the above the treble bell has a plain hunt, and there is dodging at all the treble leads. In the method called

TREBLE BOB, which commences on six bells, the treble has a dodging hunt.

II. ODD BELL METHODS, BUT WHICH CAN BE APPLIED
TO THE EVEN NUMBERS :—

GRANDSIRE, which commences on five bells. From
it is formed

UNION, which commences on seven bells, but is never
rung.

In both of these methods, the treble has a plain hunt,
and there is dodging at the treble leads.

PLACE RINGING, in which the treble has a plain
hunt, and there is place-making, but no dodging.

STEDMAN'S PRINCIPLE, in which all bells do the
same work. From it are formed

STEDMAN'S SLOW COURSE, and

SHIPWAY'S PRINCIPLE, which is an application of
Stedman's principle to the even numbers.

Thus there exist in scientific change-ringing five distinct
systems, of which all but one have several recognised varia-
tions, and all admit of three different arrangements, viz., the
simple, the reversed, and the double. Thus the changes
can be brought out into peals practically inexhaustible in
number, and of every degree of complication.

The Place Method may be said to apply to both odd and
even numbers equally.

N.B.—This Table is introduced here for convenience; the
technical terms employed are explained each in its proper
place.

Change-Ringing Disentangled.

I. A Church Bell at Rest.—The man who desires to ring well must acquaint himself with the manner in which a bell is fitted and hung. Let him therefore go into the belfry and examine carefully a bell when at rest. Upon the crown are four small handles or ears, called the ‘canons,’ by means of which it is fastened to the under-side of a block of wood, called ‘the stock;’ this stock rests by means of two pivots called ‘the gudgeons,’ in the ‘brasses,’ or brass-sockets, which are let into the timbers of the bell-frame or cage. It is upon these gudgeons that the bell swings; and the brasses, besides being perfectly level, must be carefully supplied with oil or grease, and kept quite free from grit or dirt of any kind. To one end of the stock is attached a wheel, provided with a groove on its outer circumference to receive the rope, and thus to afford the means of swinging the bell easily. That part which is called the felloe of a carriage-wheel is called ‘the sole’ of the wheel of a bell; the rope is so fastened as to pull from a fixed point on the sole, called ‘the fillet;’ and from the fillet it descends into the

ringing-chamber below, over such fixed pulleys as are necessary to guide it to the required spot. Ordinarily, the rope is passed through the sole at the fillet, and tied securely to the upright spokes of the wheel. From the top of the stock there rises a strong upright piece of wood, called the 'stay ;' and immediately below the bell's mouth, fixed to the frame, is the 'slider' or sliding rest, which can move easily backwards and forwards between two blocks, and by which the stay is caught when the bell is thrown mouth uppermost. Another form of stay is used at times, which it is unnecessary to describe at present.

II. The Bell in Motion.—The learner should next place himself at some point from which he can conveniently watch the bell while it is being rung. He will see, in the first place, that the clapper, which rests on one side of the bell when she is set mouth uppermost (bells are always spoken of in the feminine gender), moves with her as she is swung round ; and at the moment when the bell slackens her motion as she turns mouth uppermost, being about to balance, the clapper flies across, and, striking the opposite side, lies still once more on the place which it struck.

(2.) He will observe, in the second place, that as the bell is set, the stay rests against the slider on one side and on the other alternately ; and that the rope at the one position crosses the wheel, merely touching it ; but at the other position, the rope is

The Bell in Motion.

3

wound round the wheel for the greater part of its circumference. The former position is that of the 'hand-stroke;' the ringer then has the tuffing of the rope in his hand, and the slack part lies before him on the floor in a large loop, the extreme end being held in his left hand. The latter position is that of the 'back-stroke;' and the ringer then has only the extreme end of the rope within reach, a large portion being gathered round the wheel.

(3.) It may occur to the watcher that this 'setting a bell at hand-stroke and back-stroke,' admits of a good deal of nicety. (a) If the bell be swung too hard, the stay will rebound from the slider, and the bell will return, swinging down again, instead of coming to rest. If the bell be checked too soon, she will fail to balance, not rising sufficiently high; and again she will swing down before she is wanted. (b) But that which is required is knack, not strength—the weight of the bell does the work; the hand of the ringer interferes only at what a mechanic would call 'the dead point;' *i. e.* the moment at which the bell is on the balance, and when a very slight force is required to send her either way. (c) The exact position in which a bell is brought to rest admits of some variety. She may be allowed to go right up, and back, until the stay rests against the slider; in which case she has passed the balance; and if the stay broke would swing down on the other side. She may be just balanced, so that the touch of a finger will bring her back again; or she may be held by the rope in

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some position between these two. In the first case the bell is said to be 'rung high;' in the second to be 'rung low.' It obviously will require more time and labour to bring her back from the first position than from the second; hence the former is used in slow ringing, the latter in quick ringing; and the expressions 'high compass' and 'low compass' mean in the language of ringing exactly the same as 'slow time' and 'quick time' in the language of music.

(4.) It may occur to him, also, that the bell is a large pendulum, swung through the entire circle; and that, in the hands of a good ringer, she will be balanced exactly each time she is set, without resting any weight against the stay and slider,—in fact, that a good ringer could dispense with them both. And, lastly, that from the time when the bell is pulled off the balance until she goes up and balances again, she is beyond all control, and that during that interval the rope must be left entirely free.

III. On the Management of the Rope.—No description can suffice without instruction in the belfry from a good ringer; still I will give a few hints and cautions. (1.) Begin upon a bell which has been rung up and set by your instructor: because, among other reasons, as the bell turns mouth uppermost she becomes almost stationary for a moment, and therefore the rope also waits for the hand to grasp it.

(2.) Let the instructor place the pupil in the

On the Management of the Rope. 5

proper position for ringing the bell, and then stand facing him. Let the rope be adjusted as nearly as possible to the height of the pupil, and the end placed in his hands. Let him be shown how to draw the rope as stated in (6), and cautioned neither to look up after it, nor to raise his hands as though he would push it up, but allow the rope to take up the hands until the bell balances. The teacher will then pull the bell off at hand-stroke, and the pupil will pull her off at back-stroke. After a few strokes the pupil should be shown how 'to feel the stay,' *i.e.* to allow the bell to draw him up on tip-toe as she goes gently past the balance and rests her stay against the slider. When this has been done a few times, and he can also pull the rope down steadily, the teacher and pupil should change work (but not places), and the pupil learn to pull off at hand-stroke and to 'feel the stay' on that side also, on the return of the tuffing to the grasp, while the teacher manages the end of the rope. When the learner can feel the stay at hand-stroke and back-stroke, separately, he may be trusted to pull both strokes; but the teacher must stand by his side to assist him in any difficulty which may arise, and to give any cautions which may be necessary.

(3.) When about to ring alone, let the length of the rope be adjusted carefully to your height and reach. Ropes shrink in damp, and stretch in dry, weather. Grasp the tuffing always at the same place, and firmly, with the whole hand, as distinguished from the ends of the fingers. Re-

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member that the knack which you have to acquire, and which is absolutely indispensable to good ringing, is that of pulling with the exact degree of force required to make the bell go up and balance herself. Nothing which you can do with the rope when it returns to your grasp can really correct the mistake of having pulled too hard or too lightly ; although you can then control the motion of the bell to a certain degree. The knack required in ringing may be compared to that required in order to throw open a gate with just so much force as will make it stand open.

(4.) Hold the end of the rope, never insert your hand in the loop, lest you should break a stay, and, overturning the bell, be dragged up by it, unable to loose your hold.

(5.) Stand upright. If you wish to throw your weight upon the rope, do so by dropping a knee. Never bend from the hips ; but a slight forward motion, a bow in fact, looks well and is useful : you thus cast upon the rope the weight of your head and shoulders. Stand firm,—never lift a foot. You require steadiness in ringing. And there is a risk of putting your foot down upon, or on the other side of, the rope as it falls upon the floor before you ; in which case you would be instantly tripped and thrown down as the bell gathered up the rope in its swing.

(6.) *Draw* the bell rather than *pull* it, with a continuous and steady strain ; no harder at one time than at another. Bring your hands down in

The Names and Places of the Bells. 7

front of your chest, as straight and as low as possible; they may go down well before the waist before quitting the rope.

(7.) Spare no pains to obtain perfect mastery of the bell. Go alone into the tower and practise until you can set her at hand and back-stroke with ease and certainty. Count the time according to the number of bells in the tower, and practise bringing down your bell at different intervals of time,—just when you wish to move it. Go up with a friend and practise on two bells; ringing one, two; two, one, &c., so as to acquire the habit of following and of leading correctly.

In all this preliminary practice, the bell is used dumb. The clapper being tied with two light cords so as to stand fast in the centre of the bell: if its weight incline to either side, it will affect the balance. Cords of the right length, with a loop at one end to fit over the 'flight' or tail-piece of the clapper may be kept under each bell; or one cord, with a large knot at one end, may be passed through a canon, secured to the clapper by two half hitches and then tied to the canon on the opposite side. This is, to a practised hand, the quickest mode of tying a clapper, if he be alone in the tower; and it employs the shortest length of line.

IV. On the Names and Places of the Bells.—The smallest bell is called the treble, and the largest the tenor; whatever the number of the ring or its key-note. The others are called the second,

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the third, and so on, counting from the treble to the tenor.

The bell which is struck first is said 'to lead;' that which is struck last, 'to be behind' in the change. The others are said to be in second's place, in third's place, &c.; or, more shortly, to be 'in two,' 'in three,' &c., according to the order in which they are struck. *Example.* In the change 2, 1, 3, 5, 4, the second bell leads; the treble is 'in two;' the third is at home 'in three;' the tenor is 'in four;' and the fourth is 'behind.' Any bell struck (like the third in the example) in her own place is 'at home;' and it is essential that the ringer know at every moment the place in which his bell is then struck. The expression 'home' is used in another sense also, which it is unnecessary to explain at present.

HAND-STROKE AND BACK-STROKE.—The bells having been rung up and set mouth uppermost, each is struck twice before it returns to the same position. The first of these blows is called the hand-stroke, the second the back-stroke (see above under II.). And when the bell, having been struck twice, has been brought back to the position from which she started, a whole pull has been made with her. *Example* (two whole pulls) :—

Hand-stroke.	Back-stroke.	Hand-stroke.	Back-stroke.
1, 2, 3, 4, 5,	1, 2, 3, 4, 5 ;	1, 2, 3, 4, 5,	1, 2, 3, 4, 5, &c.

The bells should be struck at exactly equal intervals of time one after the other, upon both hand-

stroke and back-stroke. Then exactly double that interval must be allowed before the next hand-stroke is made. For example, in ringing five bells, if they be struck 1, 2, 3, 4, 5, 1, 2, 3, 4, 5 ; 1, 2, 3, 4, 5, 1, 2, 3, 4, 5 ; 1, 2, 3, 4, 5, &c., each bell exactly half a second after the other, a whole second must be allowed before the treble strikes again. This is shown by the spaces left between the figures.

The operation of raising and sinking or falling a bell in peal is omitted for the present, as a feat better unattempted by the beginner until he has acquired some proficiency.

V. On Rounds and Changes.—When bells are struck in their regular order, each at home in her own place, as 1, 2, 3, 4, 5, they are said to be rung ‘in rounds ;’ when that order is varied, and they exchange places, as 2, 1, 3, 5, 4, they are rung ‘in changes.’ A ‘call-peal’ is one in which the conductor tells each man his work, and they continue repeating the same over and over again, until the conductor calls the variation which is to be made. But in ringing thus, men acquire habits absolutely fatal to true change-ringing, therefore call-peals should be positively forbidden in every tower.

Rounds must be rung, as the scale must be practised by those who are learning music ; with the same object, and with that alone, viz., to train the ear and the hand. The beginner, as he rings rounds, should always count the time ; he should

accustom himself to watch *all* the bell-ropes, as well as that which he follows immediately ; and he should ring sometimes one bell, sometimes another, so as to be able, in whatever part of the ringing chamber he may stand, to see at a glance what every other person in it may be doing. The eye assists the ear very materially in keeping true compass (*i. e.* time) ; even the man at the lead, who strikes his first or hand-stroke by ear alone, often uses the eye at the second or back-stroke, following the bell which is behind at that change, just as the other bells follow each other. Still the ear must never be idle. It is a great assistance to a ringer to know by listening alone the moment when the treble leads ; but this is by no means indispensable. Many men ring very well without it.

It is to be remembered that the larger the bell, the longer is the time which she requires to swing ; therefore in following a bell smaller than his own, the ringer treads closely on her heels, if the expression may be used : if there be a great difference in size, the larger bell will be required to be moved before that which she is to follow, in order to preserve the proper interval between their actual blows. The reverse holds good in the case of a smaller bell following one larger than itself. And if the ropes of a large bell and of a small bell come down into the ringing-room at the same time, the smaller bell strikes the first of those two.

The set or family of bells in a tower is commonly called a 'ring,' as a 'ring of six, or of eight bells.'

Hunting, Place-making, and Dodging. 11

'A peal' means the full number of changes which can be produced upon the ring of bells: but in the case of eight bells and upwards, 5000 changes are considered a peal; any smaller number a 'touch or flourish.'

CHANGES.—Strictly speaking, if one pair of bells alone change places, it is called a single change; if two pair, a double change; if three pair or more, a triple change or cross-peal. But these expressions are now obsolete, although traces of them survive in the names by which peals are distinguished. Thus the changes on four bells are called 'singles;' those on five, 'doubles;' on six, 'minor;' on seven, 'triples;' on eight, 'major;' on nine, 'caters' (*i. e.* quarters); on ten, 'royal;' on eleven, 'cinques;' on twelve, 'maximus.' The rule or system by which the changes are produced, is called 'the method.' Thus, the expression, 'A peal of grandsire doubles,' means 120 changes in the method called 'grandsire,' rung upon five bells. 'A peal of grandsire triples,' means 5040 changes in the same method upon seven bells. 'A peal of treble bob minor,' means 720 changes in the method called 'treble bob,' upon six bells. 'A peal of treble bob major,' means 5000 changes or upwards in the treble bob method, rung upon eight bells.

VI. On Hunting, Place-making, and Dodging.—The manner in which bells change can be explained by a simple illustration. Suppose five men to take their stand on the five steps of a short but broad

staircase. Let each carry a number corresponding with that of his step ; No. 1 standing at the bottom, No. 5 at the top. Let these men mark time with their feet, without moving from their steps, 1, 2, 3, 4, 5. They resemble bells rung in rounds. Next, let them leave their steps, and still beating time, exchange places one with another on the staircase. The manner in which they will move so as to change thus, admits of three or four variations, *e. g.* one man may ascend from the bottom, step by step, changing places regularly with each other man as he meets him on his way ; and, having reached the top, pause there one beat, and then descend in like manner ; make a similar pause at the bottom, and repeat the process. Another man may walk, in the same manner, down and up ; *i. e.* begin by descending. A third may begin with the pause ; waiting on his step for the space of one beat, and then starting on his path. The two men remaining may begin as a separate pair, exchange places one with another as though setting to partners, before they fall in with the movements of the others. But if all these varied movements be properly arranged, the direct paths, the pauses, and changing of any separate pair, and if the men move in correct time, they will be able to exchange places continuously without jostling one another, and without any two men ever being on the same step at the same moment.

Thus changing, they resemble bells rung in changes.

Hunting, Place-making, and Dodging. 13

Let the columns represent the steps in the staircase ; and the figures the men, according to the numbers which they carry. The first two lines give the position of rounds ; the remainder those of changes.

Bot. Step.	Step 2.	Step 3.	Step 4.	Top Step.
1	2	3	4	5
1	2	3	4	5
2	1	3	5	4
2	3	1	4	5
3	2	4	1	5
3	4	2	5	1
4	3	5	2	1
4	5	3	1	2
5	4	1	3	2
5	1	4	2	3
1	5	2	4	3
1	2	5	3	4

It will be seen that No. 1 pursues the direct path from the bottom up to the top, changing places regularly with each other number as he meets them on his way. On arriving at the top, he pauses one beat, and returns as he had come ; to make a similar pause at the bottom and to repeat the process. No. 2 does the same, except that he begins by walking down. No. 3 begins with a pause ; he waits upon his own step for the space of one beat ; then descends. The two remaining, 4 and 5, begin as a separate pair ; they exchange places once as though they were setting to partners, then they, too, move by the same rule as the others.

The direct path is termed the 'hunting-course,' or 'plain hunt,' and may be thus defined in technical language. A bell hunts when she leads a whole pull, strikes once in the place of each bell in succession, lies behind a whole pull, and then returns in the same manner step by step to the lead.

A pause such as that made by 3 is termed 'place-making.' A bell makes a place when she

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strikes twice in succession in any place except at the lead or behind ; that being part of the hunting-course.

The changing of a separate pair is called 'dodging.' A bell dodges when she moves a step backward in her path, and then goes on as before. This will be understood more clearly from the following

* * *	* * *	example :—	Here 5 is hunting up
3 5 1	6 2 4		from the lead towards tenor's place ;
3 1 5	2 6 4		2 is hunting down from behind (<i>i.e.</i>
1 3 2	5 4 6		tenor's place) to the lead. But
1 3 5	2 6 4		when 5 arrives at fourth's place,
3 1 2	5 4 6		she steps back into third's ; then
3 2 1	4 5 6		remounts into fourth's ; and goes
* * *	* * *		on her way. In like manner, when

2 has hunted down as far as third's place, she steps up again and back into fourth's, then down into third's a second time, and so through second's to the lead.

In this example the dodging is made between the third and fourth places ; therefore it is said to be 'in three and four.' Bell 5 is hunting up when she dodges, therefore she is said to 'dodge in three-four up.' Bell 2 being on her way down to the lead, is said to 'dodge in three-four down.' The full description of the work is as follows :—The treble has a plain hunting course ; bell 3 makes second's place ; 5 dodges in three-four up ; 2 dodges in three-four down ; 4 and 6 dodge together behind.

Additional explanations are given below, which

relate especially to the work of this last-mentioned pair.

Dodging may be repeated twice, and is then called double-dodging, as in the annexed example: where also two bells make third's place in succession.

		*	*	*	*
	4	1	3	2	5
Examples may be rendered more	1	4	3	5	2
clear by copying them, and using red	1	3	4	2	5
ink for one number and black for the	3	1	4	5	2
remainder; or by drawing lines of	3	4	1	2	5
red, black, green, &c. through the		*	*	*	*

numbers: the paths of the bells will thus be marked out each in its own colour.

VII. Hunting up and down. Rules for Hunting.—Hunting consists of two parts,—hunting *up* from the lead to the tenor's place, and hunting *down* from the tenor's place, or behind, to the lead.

RULES FOR HUNTING.—Suppose the beginner to ring the treble in a party of five. Let him stand well back from his rope, and so that he can see all the other ropes in the ringing-chamber. So long as rounds are rung he will have no bells below, and four above him, as he is always at the lead. Let him watch with both eye and ear the bell which follows his; and, on commencing changes, let him follow that bell by striking after her. He is now in second's place, has one bell below and three above him. Let him watch (with eye and ear) the three, notice which follows him, and follow her. He is now in third's place, has two bells below and two

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above him. Let him watch the two, notice which follows him, and follow her next time. He is now in fourth's place, and has but one bell above him; let him follow her next time; this is his first blow behind. He has now four bells below and none above him. Let him watch the four, and follow that which strikes fourth; this is his second blow behind. He has four bells below him. Let him watch the four, and as soon as three of them move, let him follow that which strikes third; thus allowing the bell which he last followed to pass him. He has now stepped down into fourth's place, and has three bells below him. Let him watch the three, and as soon as two of them move let him follow that which strikes second; thus allowing the bell which he last followed to pass him. He has now stepped down into third's place, and has only two bells below him. Let him watch those two, and follow that which leads; thus allowing the other to pass him. He has now stepped down into second's place, and has but one bell below him. Let him strike first of all next time. This is his first blow at the lead, and after leading a second blow, he must hunt up and down again as before.

These 'directions' may be expressed, briefly, thus:—In hunting up, strike on the bell which strikes on you, until you come out behind. In hunting down, see four bells move and follow the last; three, and follow the third; two, and follow the second; one, and follow that one: lead.

He need pay no attention to the *order* in which

the bells below him strike; he counts merely the *number* of ropes which move before his own. And inasmuch as he notices those bells alone which are below him, he neglects each in turn as soon as he has followed it, that is, struck next after it, because she then passes out behind him. This habit of recollecting which bells *do not concern* him is obviously of great assistance to the beginner in finding out those bells with which he has to work, because it reduces the number which he has to watch.

While hunting, he must count his way thus:—Lead; into two; into three; into four; into five; in five, four, three, two, lead, lead, &c. In change-ringing it is absolutely necessary for a man to know, at each moment, in what place he strikes his bell, and whether he is working upwards or downwards. A beginner cannot know this without counting, any more than a child can learn to read without spelling. It is perfectly true that a practised ringer can see at a glance the order in which six ropes, or more than six ropes, are moving, and can tell his own place without counting his way. It is equally true that he can read a word of six letters, or more than six letters, without stopping to spell it: also that a practised accountant can read off a column of figures and write down their sum total without adding them all up one by one. Still a beginner must spell.

My own experience is that the beginner's first difficulty is to perceive that in change-ringing each

bell has her path among the others. To overcome this difficulty the changes upon three bells should be written out before him, and he should be shown how to follow a bell in her path ; counting her place up and down in the hunting-course. He should then take the treble in three hand-bells, his instructor taking two, and should be made to ring the six changes ; until he can see clearly that his bell is struck twice in front of the other pair, 123, 123 ; once between them, 213 ; then after the pair, 231 ; then after them again, the pair having changed places one with another, 321 ; next, that his bell is struck second, or again between the other pair, 312 ; then first 132 ; then first again, the other pair changing once more, 123 ; which brings them into rounds. This must be repeated again and again. When perfect upon three hand-bells, he must proceed in like manner to four, to five, and to six hand-bells. He will then be ready for practice in the tower. I am quite aware that to hunt up and down, and to count your way, as described above, is very difficult at first ; but the difficulty soon gives way before perseverance. An easier plan can be found readily ; but it costs far more trouble as you advance to the higher stages ; because counting is (like spelling) the one sound foundation ; any attempt to evade a difficulty simply because it is a difficulty must fail ; and any suggestion that a man can learn to ring without trouble, or without exerting himself to think, is only misleading. Besides the fact, which will

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appear in the next chapter, that the learner who has thus mastered thoroughly this first stage, the hunting-course, has made sure of the two next steps also. At the same time I stipulate that a man begin to learn upon a small ring of bells, and that he proceed gradually ; from three bells, to four, and to five, before he attempt six.

It will be noticed that you are instructed to count slowly when hunting up ; ‘Lead ; lead ; into two ; into three ; into four ; &c., but rapidly when hunting down : ‘in five, four, three, two, lead.’ For this reason. It will be seen from the first example on

five bells $\begin{array}{ccccc} & 1 & 2 & 3 & 4 & 5 \\ 2 & 1 & 3 & 5 & 4 & \end{array}$ that when a bell is hunting up

$\begin{array}{ccccc} & 2 & 3 & 1 & 4 & 5 \end{array}$

and has struck once, she has to wait for five others before striking again ; *e.g.* the treble having struck once in second’s place (21354), waits for 3, 5, 4, 2, and 3 before she strikes again (23145) : the reason being that she has advanced a step over the 3. It is the same with every change until she reaches the last place. But in hunting down from behind to the lead, she has to wait for three bells only instead

of five between any two blows of her own $\begin{array}{ccccc} 4 & 3 & 5 & 2 & 1 \\ 4 & 5 & 3 & 1 & 2 \end{array}$;

viz. in this case the 4, 5, and 3, because, in stepping down into fourth’s place, she has anticipated the 2, or allowed the 2 to pass her. It is the same with every change until she reaches the lead ; and what is true of one hunting bell is true of all. Thus in hunting up a bell is struck at longer intervals of time, or slowly, and is therefore rung high ; a bell

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in hunting down is struck at shorter intervals of time, or quickly, and is therefore rung low. (See under II.) Hence we count as described in order to keep time correctly.

When a man has learnt to hunt the treble by this rule on five or six bells he should take another bell, and practise with it ; then yet another, so as to accustom him from the first to variety in his work and to change of position in the tower. A beginner will probably ring the treble for some weeks, and there is no reason against his learning to hunt her throughout a touch with the full number of bells in the tower. But as soon as he wishes to practise the work of an in bell, the company must return to the use of some smaller number, four or five : I strongly recommend them to use the hand-bells in the first instance, and I can assure them that to proceed thus carefully and by system will in the end save both time and trouble.

VIII. Rules for Place-making.—If the hunting-course has been learnt thus, place-making and dodging will be easy. For the man who knows at every moment the place in which his own bell is struck, and who is also accustomed to watch the bells above and below his own, will be able to change with them in any way required by the peal which he is ringing. For instance, if he be ringing the bob method, and wishes to strike two blows instead of one in second's place, that is to make second's place, he will proceed thus : he will lead,

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and as he leads at the back-stroke, he will notice that the treble follows him and then leads herself, or, as it is expressed, takes his bell off the lead. Thus he follows the treble at the hand-stroke, and being in second's place he follows the treble at the back-stroke also, then leads again at the hand-stroke. An example is given below. If he wishes to make third's place, some bell, which will generally be the treble, takes him off the lead at the hand-stroke. He goes into third's place on some other bell, at the back-stroke: he watches these two bells, he sees them move, he follows at the hand-stroke that which moves second; he follows the other at the back-stroke; then he leads at the hand-stroke. To make third's place is simply to ring the plain hunting-course on three bells; to make fourth's place is to ring the plain hunting-course on four bells. In all cases the treble will be one of the bells below you.

I give two examples of this work. In the first, bell 3 makes second's place; in the other, bells 4 and 5 each make third's place, but with different bells below them, and return to the lead.

EX. 1.

3	5	1	6	2	4
3	1	5	2	6	4
1	3	2	5	4	6
1	3	5	2	6	4
3	1	2	5	4	6
3	2	1	4	5	6

EX. 2.

5	4	1	3	2
5	1	4	2	3
1	5	4	3	2
1	4	5	2	3
4	1	5	3	2
4	5	1	2	3
5	4	2	1	3
5	2	4	3	1

The ringer would count thus: 'Lead; lead; into two; in two, lead, &c.:' and 'into two; into three; in three, two, lead, &c.'

IX. **Dodging.**—I refer my reader to the explanations to be found in Chapter VI. I assume that he has learnt to hunt by the rules which I have given so thoroughly as to know at each moment the 'place' in which his bell is then struck, and also the bell which he has followed at his last blow. Dodging is simply a backward step; you are hunting up, or you are hunting down; you have reached a certain point in your course; you retrace one step, then proceed. In double dodging you retrace this step twice over; this is the whole—

EXAMPLES.

I.					II.				
Single Dodging.					Double Dodging.				
4	5	3	1	2	4	5	3	1	2
5	4	1	3	2	4	5	1	3	2
5	1	4	2	3	5	1	4	2	3
1	5	2	4	3	1	5	4	3	2
1	2	5	3	4	1	4	5	2	3
2	1	5	4	3	4	1	5	3	2
2	5	1	3	4	4	5	1	2	3
5	2	3	1	4	5	4	2	1	3

It is to be remembered also that a bell is hunting up until she has both reached the last place and also struck two consecutive blows in that place; and that she begins to hunt down as soon as ever the second blow behind has been struck. Therefore a bell which has to dodge behind as she

Dodging.

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goes up (like the 4 in example 1), hunts up to the last place, steps back immediately into the last place but one, steps up again into the last place, strikes a second consecutive blow in that last place, and then hunts down. Thus she has hunted out behind and made one backward step, before completing her hunting-course by striking two consecutive blows behind. If she is dodging doubly on her way up (as the 3 in the second example) she steps down a second time from the last place into the last but one; then up again into the last place, strikes her other blow behind, and hunts down.

On the other hand, the bell which has to dodge behind as she comes down, like the 3 in the first example and the 2 in the second example, completes her hunting-course by striking the two blows behind, takes one step in her downward path, then retraces that step, either once or twice as may be required. Thus, in dodging behind as you go up, you dodge with the bell which you find in the last place. In dodging as you come down, you dodge with the bell which comes up to meet you. The two men who are dodging together should look at each other, and each catch the eye of the other. This practice gives confidence to both; and also enables the one to put the other right if he fall into any mistake. And beginners are very apt to forget whether they should hunt up or hunt down after the dodging is completed, especially in double dodging.

In ringing upon four bells, or five bells, the

dodging is in the two last places alone; but in ringing on six bells, you dodge in three-four as well as in five-six; and on seven bells, in four-five and six-seven, both up and down. But the man who has learned to hunt by counting his place, will be able to watch the bell with which he is to dodge, and those below him also, and to step alternately up and down, or down and up, as may be necessary, passing his companion in the dodge, or allowing that companion to pass him, as explained in the rules for hunting. Explanations as to the time at which to dodge will be given in their proper place.

X. On the Study of Ringing.—Very much can be accomplished outside the belfry; so much indeed, that it may almost be said that a man should learn his work at home on paper, with the help of a book or of a friend, and should go to the tower to practise only. Also, although all ringers have been learners themselves, and should therefore be willing to teach, yet teaching is very dull and irksome, and the whole band is kept back to the level of the learner; therefore the beginner should feel bound for the sake of all concerned to spare no pains or trouble which may quicken his progress. He must lean upon others, but he should tax their patience as little as possible.

The learner should habitually ‘prick’ peals, *i.e.* write them down, working out their changes by the rules given for them; a slate is more convenient than paper for this purpose. When a peal has been

pricked, the work of the bell which he intends to ring should be analysed, as in an example which will be given further on. Then, having learned thus the work which his bell has to do, the beginner should take his place behind some good ringer employed with that bell, and watch the bell as the work is actually done. He will thus rehearse the work of hunting, place making, and dodging, and soon be ready to take the rope himself.

A peal can be rehearsed in imagination, thus: Suppose the learner to be one of five ringers, let him imagine himself to be standing at his own bell; let him take four points in positions suitable to represent the four other ropes in the tower: sticks, the corners of a table, anything will mark the points. Then, with the figures before him, let him study his own bell's work; looking from point to point as he would look from rope to rope, and imagining them to move as the ropes do in reality. It is not necessary to mark the points at all; and, with changes pricked on a card, I have thus often rehearsed a peal during a walk.

It is also very useful to practise counting in the street, &c. Many men find at first much difficulty in counting backwards; five, four, three, two, lead.

Peals are never printed in full; ordinarily the 'lead ends' only are given, *i. e.* those changes when the treble leads at her back stroke; and the treble's figure (1) is omitted, because, as it is always in the same place (the first) at that stroke, the repetition of the figure would be useless. It is to be

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understood that figures printed thus, 2 5 3 4, mean 1 2 5 3 4, and represent a change rung when the treble led at her back-stroke. The lead-ends enable a man to test the correctness of his pricking at every few lines.

‘A lead, or treble lead,’ means the changes rung between that at which the treble leaves the lead to begin her hunting-course, and that at which she completes her lead after coming down again. In simple methods all the bells hunt during the first lead. The changes thus made are, in number, exactly double that of the bells changing; and their order can easily be so arranged, that when the treble returns to the lead, they shall either come into rounds again, at her back-stroke, or else, as she moves up into second’s place, they begin to repeat the changes already made. Hence the hunting-course can be learned on every bell in turn; viz. by ringing a treble lead over and over again repeatedly.

And I strongly advise a man who has learned to hunt upon one bell, then to take another and learn upon her; then a third, and to continue this practice until he can take any bell indifferently, without being confused by standing in a different place in the tower, or by commencing his work at another point in the hunting-course. For the same reason the treble lead should be rung over and over again repeatedly, so as to avoid the idea that the learner has always to begin in one and the same manner.

A bell is said to 'turn another from the lead,' or to 'take the lead from her,' when she leads next after the bell thus turned away or taken off. And, in like manner, to 'turn another from behind,' when she goes 'behind,' *i. e.* into the last or tenor's place; next after the bell thus turned away from that place. When two bells, the one hunting up and the other hunting down, exchange places elsewhere than at the lead or behind, they are said to pass each other in those places where they thus exchanged:—

	Example.
Here 'the 4 passes the treble in	4 5 3 1 2
two-three,' or 'the 4 meets the treble	5 4 1 3 2
in two,' or 'treble turns four into	5 1 4 2 3

three.' All these modes of expression are used; but among them I prefer the first.

The number of changes which can be rung is decided by the arithmetical law of permutations, and is equal to the product of the numbers multiplied one into the other. Thus, the changes on three bells are $1 \times 2 \times 3 = 6$: those on four, $1 \times 2 \times 3 \times 4 = 24$: on five, $1 \times 2 \times 3 \times 4 \times 5 = 120$, and so on for any numbers. The object of the composer is to produce a peal which shall be at once correct and musical.

I would now request attention to the fact, that each advance in the art of change-ringing follows upon that which has gone before, in a manner so direct and natural that they may be truly said to *grow* one out of the other. Hence it possesses that high interest which properly belongs to the

development of a science ; and the learner may be assured that he will be able to master this art provided that he will be at the pains to ground himself in the hunting-course, and that he will take care to understand every forward step as it is made before he attempts to make another.

Hence, also, appears the extreme importance of mastering the hunting-course. Counting your place is to ringing that which spelling is to reading. It is evident already that the man who has learned thus to hunt, has, in so doing, made sure of two steps additional, viz. place making and dodging. I am quite aware that a plan can be proposed which is at first sight easier. But my earnest advice to a beginner is to grapple manfully with a difficulty,—to have nothing to do with royal roads or easy modes of learning, nor with any ‘aid,’ so long as he is ringing on a small number of bells. Aids have their proper place in which they are most useful ; but their proper place is most certainly not at the outset. If employed then they will tend to prevent a man from learning his work thoroughly, and will therefore, in the long run, entail far more trouble than they save.

A man must know at each moment the place in which his bell is then struck. A beginner cannot know this without counting. Counting his place is all that he requires in learning to hunt on a small number of bells ; and if he does so learn on five bells, he will find also that he needs no other aid on seven. Therefore once more I advise him stren-

uously to learn by counting alone, and I can assure all concerned that if this course requires at first patience and application in the learner himself, and in those with whom he rings, nevertheless, that the work once done will never be any trouble again; that the time occupied in laying a thorough foundation is not spent, but invested; and that it will be repaid manifold as the party advances to the higher branches of the art. The beginner will be rewarded with that confidence and ease which (in ringing as in more important matters) are reserved for those only who master their subjects: the company will gain a recruit on whom they can rely and who will never be a drag upon them, keeping them back from methods which he cannot understand, because new to him.

XI. Hand-bells.—Any method can be thoroughly learned on hand-bells. These cost, according to their size, from 3*l.* to 6*l.* for a set of eight; they can be purchased from any bell-founder who pays especial attention to their manufacture. They are used as follows :—The ringers sit in a circle, each holding one bell; they strike upwards towards the shoulder and downwards towards the knee, to represent the hand and back-strokes, stopping the bell each time with a slight jerk. At the up-stroke the bell is stopped against the thumb, which is held straight and rigid; and the bell is held mouth uppermost but pointing slightly towards the person, so that the clapper also leans inwards.

Then all is ready for the down-stroke. They follow the same rules as in the church-tower.

The use of hand-bells economises the ropes, &c. in the tower ; spares the residents adjoining much noise and annoyance, and enables the ringers to obtain far more practice in the same time, because they are struck so very much more quickly than the large bells can be rung by inexperienced hands.

The practice on the church-bells with clappers tied can be continued to any extent desired. I have myself had all the eight bells in our tower thus rung dumb. An ingenious apparatus has been constructed (although I have never seen it), by which at each stroke a small gong is sounded so that the party in the belfry can practically hear their bells while they are inaudible to all the world besides.

XII. Changes on Three Bells.—These are six in number, viz.

1	2	3	They are all produced by hunting
1	2	3	alone : therefore all description has been
2	1	3	anticipated under VI. and VII. It is not
2	3	1	likely that they will be rung excepting as
3	2	1	a beginner's first essay, and upon hand-
3	1	2	bells.

I may remark here, once for all, that when changes are rung upon three or four only of the bells in a tower, the full number of the bells are struck ; the others being

struck 'at home,' or each in their own place. Thus the ringers are practised in the compass or time of the full ring of bells, and the effect out-of-doors is much better.

COVERING.—The tenor is said to 'cover' the other bells when she is struck constantly 'at home' in the last place, without changing with them. In this case, each man as he leads knows that the tenor is necessarily 'at the opposite end' of the change which is struck; therefore in leading he can follow the tenor, or, as it is expressed, lead off the tenor.

XIII. Changes upon Four Bells; or Bob Singles; 24 in number.—The hunting-course alone will produce all the changes possible upon three bells, but in those upon four it is necessary to employ in addition both the other variations already explained; viz. place-making and dodging. This is done upon a method extremely simple, and yet capable of being applied to any number of bells from four to twelve. It is especially suited to the even numbers, but can be adapted to the odd numbers also. It is called the 'bob method,' and its rule is as follows:—All the bells hunt until the treble leads; the bell which she turns from the lead makes second's place, and leads again; those above second's place making at the same time a single dodge.

The whole peal is here given, viz. :—

1	2	3	4				
2	1	4	3		4	2	1 3
2	4	1	3		4	1	2 3
4	2	3	1		1	4	3 2
4	3	2	1		1	4	2 3
3	4	1	2		4	1	3 2
3	1	4	2		4	3	1 2
1	3	2	4		3	4	2 1
1	3	4	2		3	2	4 1
3	1	2	4		2	3	1 4
3	2	1	4		2	1	3 4
2	3	4	1		1	2	4 3
2	4	3	1		1	2	3 4

The learner will observe that the treble, and she alone, has a plain hunting-course throughout. Hence her work has been explained already. All the other bells have to vary, each taking her turn in making second's place, and in dodging in three-four.

Analysis of the work, *e.g.* that of bell 4. She hunts down and leads; hunts up, passes the treble in two-three, dodges with the 2 in three-four up, is turned from the lead by the treble, makes second's place and leads again; hunts up, passes the treble in three-four, dodges with the 3 in three-four down, which completes the peal. N.B.—On dodging *up* and dodging *down*, see pages 22 and 23.

RULES FOR RINGING.—It will be seen from the figures, that the treble has an uniform course throughout; therefore she can be used by the others as a guide. It can be ascertained from an analysis that the various parts of each bell's work follow each other in a regular order. Therefore, if

a man has learnt that order in which his work comes to him, he will know after completing each portion, what he has to do next. Hence we obtain the two rules following, both of which should be committed to memory, and used while ringing, for, although either is a sufficient guide, it is well to have 'two strings to the bow.'

Rule 1. To ring by meeting the treble. If you pass the treble in one-two (*i.e.* if she take you off the lead), make second's place, and lead again. If you pass her in two-three, dodge in three-four up. If you pass her in three-four, dodge in three-four down. See Chapters VIII. and IX.

Rule 2. To ring by the course method. After making second's place, dodge next lead in three-four down; then, the next lead, dodge in three-four up.

It will be seen from the figures, that bell 3 does the work exactly as described. The other bells keep to the same order, but commence at different points, *e.g.* the 2 dodges in three-four down, then in three-four up, and lastly, makes second's place. The 4 begins with dodging in three-four up.

I beg attention to these points. 1. The bell which makes second's place, and takes the treble off the lead, dodges invariably in three-four down. 2. The bell, other than the treble, which a man takes off the lead, is that which he will also turn from the last place, or from behind, and which will be his partner if he dodge in three-four up. 3. The

bell (again other than the treble) which takes him off the lead, is that which will come up to him when he is behind, and will be his partner if he dodge in three-four down.

REVERSE BOB.—The twenty-four changes may be produced by a rule the exact opposite of the foregoing, viz., the bell which the treble

1	2	3	4	turns from behind makes third's place
2	1	4	3	and goes behind again ; the two bells
2	4	1	3	below third's place making a single
4	2	3	1	dodge. I give one lead complete, and
2	4	3	1	the backstroke leads of the treble for
4	2	1	3	the remainder of the peal.

RULES FOR RINGING.—(1.) By

1	4	3	2	meeting the treble. The bell which in
1	3	4	2	hunting down takes the treble off the
*	*	*		lead, leads at once, and dodges in front
1	4	2	3	as she hunts up. That which in hunt-
*	*	*		ing down passes the treble in three-
1	2	3	4	two, dodges in front as she hunts

down, and then leads. That which meets the treble in four-three, or is turned from behind by the treble, makes third's place and goes behind again.

(2.) The course method. Make third's place as you come down, and go behind again. Dodge in one-two up, *i.e.* after striking twice at the lead; then dodge in one-two down, *i.e.* before leading.

I say no more about reverse bob, because no company is likely to ring it, and I insert it here

simply as an introduction to aid in understanding that which follows, viz.,

DOUBLE BOB, which is a combination of the two modes of producing the twenty-four changes, a method very musical in its effect, because of the continuous dodging, and perfectly first-rate piece of practice for ringers who wish to master their art.

RULE OF THE METHOD.—The bell which the treble turns from behind makes third's place and goes behind again, those below third's place making a single dodge. Also, the bell which the treble takes off the lead makes second's place and leads again, those above second's place making a single dodge.

RULES FOR RINGING.—(1.) By meeting the treble. If you turn the treble from either the lead or from behind, strike two blows, one after the other, in that place; then dodge with the bell which comes to you. If you turn any other bell from the lead or from behind, dodge with that bell; then strike the two blows in that place.

If the treble turn you from the lead or from behind, make a place and go back again (*see figures*).

(2.) The course method. Dodge in front as you hunt up, dodge behind as you hunt up; make third's place; dodge behind as you hunt down; dodge in front as you hunt down; make second's place.

1	2	3	4
2	1	4	3
2	4	1	3
4	2	3	1
2	4	3	1
4	2	1	3
4	1	2	3
1	4	3	2
1	4	2	3
*	*	*	
1	3	4	2
*	*	*	
1	2	3	4

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More briefly, dodge before up, behind up and make thirds. Dodge behind down, before down and make seconds.

The above is the work of bell 2. Bell 3 begins. Make thirds. Dodge behind, as you come down, &c. Bell 4 begins. Dodge in front as you come down; make second's place, &c. A bell dodges in front *down*, if she dodges in one-two before leading her two blows, and in front *up*, if she dodges after leading.

Thus the course method is a certain guide in ringing, provided that it is learnt by heart so perfectly that a man can take it up at any point.

1 2 3 4 5

2 1 3 5 4

2 3 1 4 5

3 2 4 1 5

3 4 2 5 1

4 3 5 2 1

4 5 3 1 2

5 4 1 3 2

5 1 4 2 3

1 5 2 4 3

1 2 5 3 4

2 1 5 4 3

2 5 1 3 4

* * *

1 2 4 5 3

* * *

1 2 3 4 5

XIV.—Changes upon Five Bells, Grandsire Doubles, 120 in number.

RULE OF THE METHOD.—All the bells hunt until the treble has finished leading; then the bell which she turned from the lead makes third's place, and returns to the lead, while the bells above third's place make a single dodge. The learner should prick the changes at once, and for this purpose I give one lead entire, and the lead ends of the remainder.

Peculiarities of the Method. (I.)

One pair of bells are always hunting, viz., the treble and another, in this case the 2;

which is said to be 'in the hunt with the treble.' (2.) One pair of bells are dodging as the treble leaves the lead. In the case of seven bells two pair, and in the case of nine three pair, dodge at this time. (3.) And one bell makes third's place. Hence this method is essentially adapted to the odd numbers.

In the case of four bells, the rule of the method alone produces all the changes possible. In this case it produces but three treble leads of ten changes each; then the bells come round. Hence it is necessary to introduce two new variations called bobs and singles in order to obtain the whole 120 changes.

A bob is a variation in the rule. Bobs are employed in all methods; the manner in which they are made varies with the method, and forms one of its distinctive features.

A bob in grandsire is made thus:—The bell which in hunting up passes the treble in two-three, as she is hunting down; makes third's place and returns to the lead. Immediately afterwards the bell which the treble takes off the lead makes thirds and returns to the lead, and the bells above third's place make a double dodge. Hence it is commonly said that 'a bob in grandsire is two third's places.'

By the use of these bobs alone sixty changes

A Bob.					
	*	*	*		
3	4	5	1	2	
4	3	1	5	2	
4	1	3	2	5	
1	4	3	5	2	
1	3	4	2	5	
3	1	4	5	2	
3	4	1	2	5	
	*	*	*		

can be obtained. It is then necessary to introduce yet another variation, called a single, to prevent the bells from coming round; in this way we are able to ring the whole 120, when a second single completes the peal.

A single on five bells is that which its name implies, a single change; two bells lie still and one pair change, the remaining bell leading. Its effect is to cause two bells to exchange their work, or, as it is expressed, to 'shift their courses;' so that the

	A Single.					
	*	*	*			
3	2	1	5	4		
3	1	2	4	5		
1	3	2	5	4		
1	3	2	4	5		
3	1	2	5	4		
3	2	1	4	5		
	*	*	*			

second half of a peal thus rung, with a single in the middle, is exactly like the first; except that the 2 is throughout in the place which the 3 did fill, and the 3 in the place of the 2. The name single is retained on higher numbers, even after it has ceased to be strictly accurate, whenever bells lie still to allow others to exchange work or 'shift courses.'

It is made thus. The bell which meets the treble in two-three strikes four blows in third's place, and returns to the lead. That which the treble turns from the lead makes second's place and leads again. The bells above third's place make a double dodge; exactly as they do at a bob.

The word 'course' is used by ringers to express several different ideas; an inaccurate habit which is often very perplexing to beginners. As applied to a peal, the word 'course' or 'plain course' means the number of changes which can be pro-

duced by the rule of the method alone without the use of either a bob or a single. The grandsire method produces thus, treble leads in number less by two than that of the bells which are changing, *i.e.*, three leads on five bells, five leads on seven bells, &c. The bob method produces leads less by one than the numbers of the bells, *i.e.*, three leads on four bells, five leads on six, &c.

The word *course*, when applied to a single bell, describes her work in the plain course, or her path among the other bells. Thus the expressions, the 'hunting course,' or 'to run a plain course,' mean the same as 'to be in the hunt, or to hunt.' To 'learn the course of a bell' means to commit to memory the order in which the different portions of her work are done, *viz.* the dodging, place-making, &c. Thus, if two bells blunder in their dodging, that which ought to hunt up hunts down, and *vice versa*, they will have 'exchanged courses,' *i.e.*, each will have stumbled into the path which belongs to the other.

The word 'course' has yet other meanings, but I need not speak of them at present.

I will now give the lead-ends of a peal of 120 changes, the first lead of which has been already printed at length, distinguishing the bobs by the letter B, and the singles by the letter S. The two parts being placed side by side, the resemblance between them, and the exchange of work by the 2 and 3, caused by the single, are readily seen. The learner should prick the peal in full.

	1st Part.					2nd Part.			
	2	3	4	5					
	2	5	3	4		3	5	2	4
B	3	4	2	5	B	2	4	3	5
	3	5	4	2		2	5	4	3
B	4	2	3	5	B	4	3	2	5
	4	5	2	3		4	5	3	2
S	3	2	4	5	S	2	3	4	5

RULES FOR RINGING.—I strongly advise the learner to ring this method by the rule of meeting the treble alone ; the practice will be very useful to him in acquiring a good ‘rope-sight,’ or skill in watching bells at work ; also the bobs and singles are introduced so frequently that the course method is of but little use.

To ring by ‘Meeting the Treble.’ If you pass the treble in one-two (*i. e.*, if she takes you off the lead), make third’s place and return to the lead.

If you pass her in two-three, dodge in four-five as you go up.

If you pass her in three-four, dodge in four-five as you come down.

If you pass her in four-five, run in the plain hunt.

At a bob :

If you pass the treble in one-two, make third’s place, and return to the lead.

If you pass her in two-three, make third’s place, and return to the lead.

If you pass her in three-four, dodge twice in four-five as you go up.

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If you pass her in four-five, dodge twice in four-five as you come down.

At a single :

If you pass the treble in one-two, make second's place, and lead again.

If you pass her in two-three make thirds twice over (strike four blows in thirds), and return to the lead.

If you pass her above third's place, dodge as at the bob.

THE COURSE METHOD.—It will be seen from the plain course that the bells work thus : Make thirds, dodge in four-five down, then in four-five up. It is said commonly that a bob shortens this work one lead, which means that a bell does at the plain lead next after a bob, work which would not have come to it until the following lead, excepting through the action of the bob. But this applies really to one bell only in the five. The treble never varies, the bell which, in her ordinary work makes third's place, is unaltered ; one bell is stopped by the bob in third's place, and thrown into the hunt ; the bell which had been in the hunt with the treble is made to dodge twice in four-five down, and thrown out of the hunt. In the same way the single shortens by one lead, the work of two bells. Hence both bobs and singles are best rung by the rule of meeting the treble only.

TO FIND THE BELL WITH WHICH TO DODGE.
—The bell which you take off the lead is that which you will also turn from behind, and she will be your

partner if you dodge in four-five up ; the bell which takes you off the lead will come up to you behind, and will be your partner if you dodge in four-five down. The bell which has been in the hunt with the treble always dodges twice in four-five down at both a bob and a single.

I would now refer my reader to the explanations of the place-making and the dodging given already in chapters VIII. and IX. Especially should he bear in mind that dodging is simply a backward step in the hunting-course, taken once, or in double dodging twice, and that the hunting is then resumed.

He should also watch for the treble when he is dodging or making a place. It will be seen from the figures that (in grandsire doubles) the treble, in all cases, separates the bells which are dodging in four-five. That which has been dodging in four-five down, on coming into fourth's place at the end of her dodge strikes the treble, and knows at once that she must hunt down to the lead. The bell which has been dodging in four-five up loses her partner, and strikes her second blow behind on the treble, then goes down, the reason being that the treble never varies from her path, and all others must make way.

The bell which has been stopped in third's place by a bob, or in the second place by a single, goes into the hunt, and continues there until the next call ; then she dodges twice in four-five down.

There are four different events in which a bell

has to make a place in grandsire ringing, viz., third's place in the ordinary work, at a bob, at a single (twice over), and second's place at a single. The treble is always one of the bells below you, and in three cases out of the four she is the bell which you strike last in the place which you are making. Here, as in the dodging, the treble comes up to you, and thus shows that the special work is done, and that it is time for you to go down to the lead.

Other memoranda of the like kind might be added, but it will be more useful to the practitioner to search them out for himself by careful study of the peals which he pricks, especially in connexion with the observation bell (on which see below) as well as the treble.

ON CONDUCTING.—In ringing on five bells a conductor is necessary. It is his business to call the bobs and singles at the proper time, for which purpose he guides himself by watching one bell in particular, called the observation bell; and makes his calls as she enters certain positions with respect to the others; according to rules which he carries in his memory. In the above peal the tenor is the observation bell, and the rule as follows: call a bob when the tenor dodges behind, and a single when she and the 4 are both at home.

The observation bell is defined by Mr. Troyte to be 'That bell whose work in the peal is the most regular.' Any bell can be selected for the observation, the treble excepted. And the right

moment at which to call is, in grandsire, just before the treble strikes in the third place on her way down.

A young conductor will do well to ring the observation bell himself. One of skill and experience will watch her work, and also will look round at the other bells to see whether they are struck in their proper places at the end of each division of the peal, and if a mistake has occurred he will alter his calls until he brings the bells into the order which he wishes. It is really wonderful how much a first-rate conductor can effect in this way, even on high numbers of bells, and in very complicated methods.

Although it is very difficult to conduct a peal thus, the mere calling can be accomplished on grandsire doubles by memory alone, and by one's own bell, without much reference to the observation. Suppose the peal runs thus : a plain lead, a single, a bob, and a single, twice repeated. This order can be recollected without difficulty, and if a man notices the place in which he meets the treble as he comes down to the lead, the position of his own bell will inform him of the moment at which the treble is about to enter third's place.

Let us look once more at the figures. Suppose that you have been dodging in four-five up, the bell with which you have dodged goes down, the treble comes up, and, as you strike your second blow in fifth's place, you see the treble in fourth's, or you strike on the treble when she is in four. She

follows you down, and as you strike in the second place, she strikes in the fourth, consequently, if you call a bob or single after your blow in the second place, and before you lead, you will call just before the treble strikes in three. If you have been dodging in four-five down, you will meet the treble when she strikes in third's place and yourself in fourth's, or one step lower than in the last instance. Then when you lead at the back-stroke she will strike in fourth's (see the figures). Consequently a call immediately after your back-stroke lead, will be uttered as the treble is about to strike in third's place. For the same reason, if you meet her one step lower, viz., when she is in two, you will call immediately after your blow in third's place as you hunt up, and if you take her off the lead then you will call immediately after your first blow in fifth's or when you turn her from behind. And we obtain these memoranda :

If you meet treble in five-four, call before you lead.

If you meet her in four-three, call after back-stroke lead.

If you meet her in three-two, call after your blow in three.

If you meet her in two-one, call after your blow in five.

Or, more briefly, four, after two, three, after back-stroke, two, after three, one after five. Each place lower, two blows later.

Of course this work is not 'conducting,' it is

only 'calling.' It may serve as an introduction to conducting if you ring the observation bell, and take careful notice of her work as well as employ your memory. And without the observation no touches can be called on higher numbers than five bells. The ringer gains so much by acquiring the habit of watching other bells besides his own, and it is so great a convenience to have more conductors than one in a company that all practitioners should study this branch of the art.

Peals are divided into 'parts,' which may be described as repetitions if the bells are considered all together: for the plain leads Bobs and singles follow one another in the same order in each part, although individual bells exchange work one with another. It is usual to print the lead-ends of the first part only of a peal, and to add the words 'repeated' for a two-part peal, and 'twice repeated' for one in three parts. I give examples of two and of three-part peals; two of which have their lead-ends printed in full, the remainder as above.

BELL 5, THE OBSERVATION.

1st Part.					2nd Part.				
2	3	4	5						
	2	5	3	4		2	5	4	3
S	4	3	2	5	S	3	4	2	5
	4	5	3	2		3	5	4	2
B	3	2	4	5	B	4	2	3	5
	3	5	2	4		4	5	2	3
B	2	4	3	5	B	2	3	4	5

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BELL 5, THE OBSERVATION.

1st Part.					2nd Part.					3rd Part.				
2	3	4	5											
B	4	5	2	3	B	3	5	4	2	B	2	5	3	4
S	3	2	4	5	S	2	4	3	5	S	4	3	2	5
	3	5	2	4		2	5	4	3		4	5	3	2
S	4	2	3	5	S	3	4	2	5	S	2	3	4	5

BELL 3, THE OBSERVATION.

	2	<u>3</u>	<u>4</u>	5		2	<u>3</u>	<u>4</u>	5
B	4	5	2	3	S	5	4	2	3
	4	3	5	2	B	2	3	5	4
B	5	2	4	3	S	4	5	2	3
	5	3	2	4		4	3	5	2
S	4	2	5	3	Twice repeated.				
	4	3	2	5					
Repeated.									

BELL 5, THE OBSERVATION.

	2	3	4	5		2	3	4	5		2	3	4	5
	2	5	3	4		2	5	3	4		2	5	3	4
S	4	3	2	5	B	3	4	2	5	S	4	3	2	5
	4	5	3	2		3	5	4	2	B	2	5	4	3
B	3	2	4	5	S	2	4	3	5	S	3	4	2	5
	3	5	2	4		2	5	4	3	Twice repeated.				
B	2	4	3	5	B	4	3	2	5					
Each to be repeated.														

Double grandsire cannot be rung upon five bells, and the reverse of the method is no improvement upon its simple form.

Other peals in addition to the above can easily be arranged.

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XV. Variations upon the Grandsire Method.—This chapter may be omitted by beginners. It is inserted at this place because most convenient, and it introduces peals which will be of use to those alone who have made some considerable progress in ringing. But as there are very many towers which possess no more than five bells, I wish to show that a great deal can be accomplished with that number, even although the company be so weak as to consist of only four change-ringers and a treble-man.

The peals which follow are produced by rules which differ very materially from those of Chapter XIV. and yet retain the leading characteristics of the grandsire system. I shall now study brevity because I am writing for those only to whom explanation, properly so called, is unnecessary.

ANTELOPE.—This will be esteemed generally a 'cramped,' that is, a difficult peal. But there is

...	1	2	3	4	5		5	2	4	1	3
	2	1	3	5	4		5	4	2	3	1
	2	3	1	4	5		*	*	*		
	3	2	4	1	5		3	4	2	5	S
	3	4	2	5	1		*	*	*		
	4	3	5	2	1		3	5	2	4	
	4	5	3	1	2		*	*	*		
	5	4	1	3	2		4	2	3	5	S
	5	1	4	2	3		*	*	*		
	1	5	2	4	3		4	5	3	2	
	1	2	5	4	3		*	*	*		
	2	1	5	3	4						
	2	5	1	4	3		3	2	4	5	B

Repeated.

Variations upon the Grandsire Method. 49

nothing in it which need frighten a man who can count his place and ring by meeting the treble.

Observation bell 5. The bell which meets the observation and treble as she leaves the lead makes fourth's place, strikes once only behind, and hunts down. That which meets the same pair as she leaves the second place strikes thrice behind, and dodges into fourth's place; then strikes twice behind, and hunts down. A single is called whenever the observation dodges behind, and a bob when she and 4 are both at home.

CAMBRIDGE DELIGHT produces very beautiful music, and is a most useful piece of practice, because it introduces ringers to dodging in front as well as behind.

1	2	3	4	5		*	*	*
						4	2	3 5 B
2	1	3	5	4		*	*	*
2	3	1	4	5		2	5	3 4 B
3	2	4	1	5		*	*	*
2	3	4	5	1		3	4	2 5 B
3	2	5	4	1		*	*	*
3	5	2	1	4		4	5	2 3 B
5	3	1	2	4		*	*	*
5	1	3	4	2		3	2	4 5 S
1	5	3	2	4 B				
1	3	5	4	2				

Repeated.

Observation bell 5. A snap is called whenever the observation and treble are together behind: the bell in third's then makes that place and returns behind, and those before dodge once. A bob is

called whenever the observation and treble are together before, and also whenever the former dodges behind. A single is called when the 4 and 5 are both at home.

Mem.—When a snap is called, if your bell turned the treble from the lead, you lead two blows and dodge afterwards; if any other bell, you dodge first and lead two blows after dodging. There are no plain leads.

ST. DUNSTAN'S DOUBLES.—This is the most difficult peal of the three, but it is both interesting and amusing, as it introduces work entirely new. We used to ring it habitually in a purely agricultural parish.

2	3	4	5	
<hr/>				
4	5	2	3	B
*	*	*		
3	2	4	5	S
*	*	*		
4	5	3	2	B
*	*	*		
2	5	3	4	E
Twice repeated.				

EXAMPLES.				
The 1st Extreme.				
3	2	5	1	4
2	3	1	5	4
2	1	3	4	5
1	2	3	5	4
1	2	5	3	4
2	1	5	4	3
2	5	1	3	4
5	2	3	1	4
&c. &c.				

Observation bell 2. Peculiarity: the extremes which are made thus. The bell which the treble displaces from the lead makes second's place and leads again. That which meets the treble in two-three makes third's in going up, and strikes once only behind; that which meets her in three-four strikes once only behind, and makes third's place

in coming home ; that which meets her in four-five strikes twice behind and once in fourth's continuously, until the treble comes back and turns her from behind.

If the treble and the observation bell are met on their way down, the latter coming before the former, an extreme is at hand : this call is made as the treble takes the lead from the observation.

Singles may be substituted for bobs.

XVI. Changes upon Six Bells,—720 in number.—I have entered very fully into all preliminary matter. This has been intentional. In the future I shall proceed upon the assumption that my reader takes care to master thoroughly all that has gone before ; and that if he meet with anything which he does not understand, he will turn back to the paragraph in which it has been made clear. For although I shall set forth carefully the meaning of any additional technical expressions which I may have to employ, I shall not repeat any explanations given already.

BOB MINOR.—Six bells are rung according to this method, by the same rules as are four, subject only to the variations arising out of the greater number of bells, and out of the necessity of employing bobs and singles.

The Hunting-course. The first step necessary is for the learner to make quite sure that he is perfect in the hunting-course upon six bells, as any addition to the number to which one is accustomed

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is perplexing at first. I strongly advise my pupil to hunt by counting his place alone, according to the rules given in Chapters VI. and VII. The eye can take in with ease motions far more rapid, and far more numerous and more complicated than those of six bell ropes around a circle; and there is no real difficulty in accustoming yourself to follow the man who followed you, until you work your way into the sixth place. Then to see five ropes move, and to follow that which moves fifth; to see four ropes move, and to follow that which moves fourth; to see three move, and to follow that which moves third; to see two move, and to follow that which moves second; to see one move, and to follow that one; then lead, counting your way down as described already. No other plan ensures so 'good a sight of ropes,' which means ease and readiness in watching other bells; or lays so secure a foundation for all future work.

To perfect the learner in hunting, the first lead, *i.e.* first twelve changes, of the course should be rung over and over again. Or the changes may be commenced thus, 2 1 3 4 5 6, when the lead will repeat itself if the place-making be omitted at the thirteenth change, and thus every bell will hunt continuously without ever coming into rounds. But as the back-stroke lead of the treble produces 1 2 3 4 6 5, they can readily be brought out into rounds by signal from the conductor. Whichever way this lead be rung, it should be repeated many times without stopping, so as to prevent the learner

Changes upon Six Bells.

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acquiring the idea that his hunting begins at some particular point of the work, and to set it before him as a continuous path among all the other bells.

RULE OF THE METHOD.—All the bells hunt until the treble comes back to the lead. That which the treble turns from the lead, makes second's place and leads again; the bells above second's place make a single dodge.

The plain course thus rung, contains sixty changes; of which I give the first lead entire, and the lead ends of the remainder.

The learner should, at once, write out this plain course for himself, when he will be able to see that at each leading of the treble the bells are arranged in three couples. The treble and the bell which she takes off the lead form one couple, another pair is dodging in three-four, and the third pair is dodging in five-six. So that a man who can ring bob-singles, or this method upon four bells, has only to learn the additional work of dodging in five-six up and in five-six down, in order to be able to ring upon six.

RULES FOR RINGING.—(1.) By meeting the treble.

1	2	3	4	5	6
2	1	4	3	6	5
2	4	1	6	3	5
4	2	6	1	5	3
4	6	2	5	1	3
6	4	5	2	3	1
6	5	4	3	2	1
5	6	3	4	1	2
5	3	6	1	4	2
3	5	1	6	2	4
3	1	5	2	6	4
1	3	2	5	4	6
1	3	5	2	6	4
	*	*	*		
1	5	6	3	4	2
	*	*	*		
1	6	4	5	2	3
	*	*	*		
1	4	2	6	3	5
	*	*	*		
1	2	3	4	5	6

If you pass the treble in one-two, make second's place and lead again.

If you pass the treble in two-three, dodge in three-four as you go up.

If you pass the treble in three-four, dodge in five-six as you go up.

If you pass the treble in four-five, dodge in five-six as you come down.

If you pass the treble in five-six, dodge in three-four as you come down.

(2.) The course method. After making second's place, dodge in three-four down ; at the next lead, dodge in five-six down ; at the next lead, dodge in five-six up ; at the next lead, dodge in three-four up ; and then begin again with making second's place ; or, expressed shortly, make seconds ; dodge in three-four down, in five-six down ; in five-six up, and in three-four up.

This work on six bells should be compared with that on four. It will be seen that much which has been learned already, holds good still. For instance :—Besides the rule that the bell which the treble takes off the lead, makes second's place and leads again. The bell which goes behind on the treble has a second blow behind, and dodges in three-four down. The bell which is turned away from the last place by the treble is also taken off the lead by the treble.

It is a rule invariable on any number of bells, that if you dodge behind as you go up, you dodge with the bell which you find in the last place ; if

you dodge behind as you come down, you strike a second blow in the last place, and dodge with the bell which comes up to you. Directions are given below by which to find the partner with whom to dodge.

The plain course should be rung repeatedly until the learner be quite familiar with the work ; but it will be well if he change his bell sometimes, because as the same bells will of necessity be met in the same order, again and again, men are certain to learn their part by heart at all events to a great extent, and therefore to trust to their memory rather than acquire the power of looking for and finding their bells.

The learner should know both the above rules for ringing so perfectly as to have them quite at his fingers' ends, and be able to commence working with either at any point. He should make use of them both, and he will find, naturally, that they assist each other mutually. For instance :—Supposing a man has dodged in five-six down ; he knows (by the one rule, the course-method) that he will dodge at the next lead in five-six up ; therefore he knows also (by the other rule) that when he strikes in the third's place, the treble will meet him in fourth's, and he is spared the trouble of looking for her. Other points may be remarked with advantage,—such as the place in which the treble is met after a man has finished dodging in five-six or in three-four, and up or down respectively, because meeting the treble separates the

dodging bells and warns the bell which strikes her to go down to the lead at once. Knowledge of such details not only gives confidence by assuring the practitioner that he is doing right, but may often save him from a mistake as to whether he is to hunt up or to hunt down after dodging; or may enable him to put right a partner who is in doubt. At the same time, it will be more useful to a learner to work out these matters for himself, by a careful study of the figures than that I should do it all for him.

BOBS AND SINGLES.—At a bob, the fourth

EXAMPLES.

A Bob.

* * * *
 3 5 1 6 2 4
 3 1 5 2 6 4
 1 3 2 5 4 6 B
 1 2 3 5 6 4
 2 1 5 3 4 6
 2 5 1 4 3 6
 * * * *

A Single.

* * * *
 3 1 4 2 5 6
 1 3 2 4 6 5 S
 1 3 2 4 5 6
 3 1 4 2 6 5
 3 4 1 6 2 5
 * * * *

place is made instead of the second. The bell which was about to dodge in three-four up makes fourth's place, and returns to the lead. That which was about to dodge with it (*i.e.* in three-four down) comes down to the lead. That which was about to make seconds omits doing so, and hunts out behind.

At a single three bells lie still, viz., those in the third and in the fourth places in addition to that in the second place (which the treble has just taken off the lead), and the former, that which should have dodged in three-four down, *goes back behind*;

while the latter, that which should have dodged in three-four up, returns to the lead. The bells

(a) At a bob.

If you pass the treble in one-two, hunt out behind and back again.

If you pass her in two-three, make fourth's place and return to the lead.

If you pass her in five-six, hunt straight down to the lead.

(b) At a single.

If you pass the treble in one-two, make second's place, and return to the lead.

If you pass her in two-three, make fourth's place, and return to the lead.

If you pass her in five-six, make third's place, and go back again behind.

If you pass her in three-four or four-five the work is unaltered by either bob or single.

In ringing by the course method. (a), At a bob. Three bells only are affected, viz., those which respectively run in quick to the lead and out quick to the last place or behind, and that which makes fourth's place. Of these the first two do at the lead next after the bob the work which they were prevented from doing by the bob, the other dodges in five-six down. Or the work of the first two is lengthened by one lead, the work of the bell which made the bob is lengthened by two leads.

(b) At a single.

The bell which makes second's place is thrown forward one lead in her work, that which makes third's place, is thrown back one lead, that which makes fourth's place works as after a bob. The bells

above fourth's place are again unaffected. In other words, at the plain lead next after a single, the bell which, in her regular work, was about to make second's place, now dodges in three-four down, that which was about to dodge in three-four down, now makes seconds, that which was about to dodge in three-four up, now dodges in three-four down.

I must add that, in my opinion, it is far easier to ring by meeting the treble than to burthen the memory with all these variations.

TO FIND THE BELL WITH WHICH TO DODGE.—If you dodge in five-six up, your partner will be the bell which you took off the lead ; if in five-six down, that which took you off the lead ; the treble excepted in each case. If you dodge in three-four up your partner is the bell which you meet next after the treble as you go up ; if in three-four down, that which you passed in three-four up, or that which you find in three when you come down into four. Also the bell which makes second's place and takes the treble off the lead dodges invariably in three-four down, so she has ample warning of her work, and time in which to look out for her partner.

ON PRICKING BY THE LEAD ENDS.—Changes on bob minor are pricked thus, a plan which economises time and labour. Take the first plain lead end, and write it down in a line immediately below

the round, thus :
$$\begin{array}{cccccc} 1 & 2 & 3 & 4 & 5 & 6 \\ 1 & 3 & 5 & 2 & 6 & 4 \end{array}$$
 It will be seen by

comparison of the two lines of figures that the bells

have been removed as follows : that which was in second's place, viz., the 2, into fourth's place, that which was in third's, viz., the 3, into second's, that which was in fourth's place, viz., the 4, into sixth's, that which was in fifth's place, viz., the 5, into third's, that which was in sixth's place, viz., the 6, into fifth's. The treble is at the lead, of necessity, and therefore, as she is always in the same place at the lead end, further notice of her may be omitted. Let us continue to work according to the rule thus indicated, and transpose the lead end 3 5 2 6 4 in the same manner as that by which it was obtained. In this case the 3 will be moved from second's place into fourth's ; the 2 from fourth's into sixth's ; the 4 from sixth's into fifth's ; the 6 from fifth's into third's ; and the 5 from third's into second's place, 5 6 3 4 2. Transpose once again in the same way, 6 4 5 2 3. Repeat the process once again, 4 2 6 3 5. Repeat it yet once more, 2 3 4 5 6. Thus all the lead ends of the plain course have been obtained in a few lines ; and when any lead end is known, the next plain lead end may be written off at once.

The bob changes are made with equal ease : the first lead end, if plain, is 3 5 2 6 4 ; if made with a bob, it is 2 3 5 6 4. Thus the bob transfers to second's place the bell which would otherwise have been in fourth's : and, by so doing, moves up to the third and the fourth places those bells which would otherwise have been in the second and the third

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places. Therefore a plain lead end is converted into a bob change by simply erasing the figure in that fourth place, and rewriting it in the second place.

The single is yet simpler : it affects two places only, the third and fourth : and is produced from a plain lead end by merely transposing the bells in those places. Thus, plain lead end, 3 2 4 5 6 ; single, 3 4 2 5 6. Hence we obtain these memoranda : To write a plain lead end move the bells thus,—from second's to fourth's ; from fourth's to sixth's ; from sixth's to fifth's ; from fifth's to third's ; from third's to second's.

The lead end being thus known, to convert it into a bob change move the bell from fourth's to second's. To convert it into a single, move from fourth's to third's.

ON CONDUCTING.—It is impossible to call bob minor by memory alone, as may be done upon grandsire doubles, therefore the conductor must ring the observation bell himself, or else watch her work. As the young conductor will naturally begin with calling by his own bell, and may not wish to ring the tenor, I give below a variety of touches called by some of the smaller bells.

The proper moment for calling a bob or a single is that at which the treble is about to strike in the second place. And the lead at which a call is uttered is known by the position of the observation bell, according to the rule by which the touch is arranged.

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But there are yet two more technical expressions to be mastered.

THE TERMS 'RIGHT' AND 'WRONG.'—A bell is said to dodge 'the wrong' when she is in fifth's place at the lead end; and to dodge 'the right' when she is then in tenor's place. In the case of the tenor, 'home' is equivalent to 'the right.' These expressions may have originated in the idea that it is correct to begin at the hand-stroke, and, therefore, that the bell which dodges into fifth's at back-stroke and out at hand dodges wrong; that which goes in at hand and out at back dodging the right way. I append several examples of these expressions, and advise the learner to prick the following touches by the rules alone, using my figures merely to test the correctness of his own. And if, as is to be assumed will be the case, he is by this time expert at pricking; he will prick from lead end to lead end as described above, and will know by the position of the observation bell the lead at which the call is due.

When ringing, the conductor may remember that if he wishes to call the observation bell to dodge 'the wrong,' he will call the lead after she has dodged in five-six down.

If he wishes to call her to dodge 'home or the right,' he will call the lead after she has dodged in three-four down, or the lead after she has made fourth's place if there was a call the previous lead.

Also, as was explained in treating of grandsire doubles, the position in which he meets the treble

as he comes down from the sixth or tenor's place towards the lead, will enable him to know by his own bell the moment at which the treble is about to strike in the second place, and, therefore, the moment at which to call a bob or a single. It will be seen by the figures that if you pass the treble in six-five down, you must call immediately after leading at the hand-stroke, as she will then have struck in third's place, and will be about to strike in second's. For the same reason, if you pass her in five-four down, you must call after your own blow in second's place as you come up. If you pass her in four-three down, you must call after striking in fourth's place up. If you pass her in three-two, you call after your first blow in sixth's place, or behind. If you pass her in two-one, *i. e.*, take her off the lead, you call after your blow in fifth's place as you are coming down again. And we obtain the following memoranda : If I see the treble in five, I call after my hand lead, in four, after two up, in three, after four up, in two, after six up, in one, after five down ; each place lower, two blows later.

TOUCHES FOR PRACTICE.—As the plain course in bob minor contains sixty changes, the expression 'two courses' is equivalent to 120 changes, and 'three courses' to 180 changes. It is usual to print the bob changes only, that is, the back stroke treble leads at which a bob or a single has been made. I have frequently given all the lead ends because I am writing for beginners.

If small numbers are attached to the lines of

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figures, these indicate the number of leads after the last bob change at which the next call is to be made. The half-peal (360) is the maximum which can be obtained by bobs alone; it is then necessary to introduce a single.

THREE COURSES.

CALL THE OBSERVATION WRONG, RIGHT, WRONG, RIGHT.

Bell 2. The Observation.	Bell 3. The Observation.	Bell 4. The Observation.
<u>2 3 4 5 6</u>	<u>2 3 4 5 6</u>	<u>2 3 4 5 6</u>
3 5 2 6 4	3 5 2 6 4	3 5 2 6 4
5 6 3 4 2	5 6 3 4 2	3 5 6 4 2 B
5 6 4 2 3 B	6 4 5 2 3	5 4 3 2 6
6 2 5 3 4	6 4 2 3 5 B	4 2 5 6 3
2 3 6 4 5	4 3 6 5 2	2 6 4 3 5
3 4 2 5 6	3 5 4 2 6	2 6 3 5 4 B
3 4 5 6 2 B	5 2 3 6 4	2 6 5 4 3 B
3 4 6 2 5 B	5 2 6 4 3 B	6 4 2 3 5
4 2 3 5 6	5 2 4 3 6 B	4 3 6 5 2
2 5 4 6 3	2 3 5 6 4	3 5 4 2 6
5 6 2 3 4	3 6 2 4 5	3 5 2 6 4 B
5 6 3 4 2 B	6 4 3 5 2	5 6 3 4 2
6 4 5 2 3	6 4 5 2 3 B	6 4 5 2 3
4 2 6 3 5	4 2 6 3 5	4 2 6 3 5
2 3 4 5 6	2 3 4 5 6	2 3 4 5 6

THREE COURSES BY THE BOB CHANGES.

CALL THE OBSERVATION WRONG, THREE TIMES.

Bell 2. The Observation.	Bell 4. The Observation.	Tenor. The Observation.
<u>2 3 4 5 6</u>	<u>2 3 4 5 6</u>	<u>2 3 4 5 6</u>
5 6 4 2 3 ³	3 5 6 4 2 ²	2 3 5 6 4 ¹
4 5 6 2 3 ⁵	6 3 5 4 2 ⁵	5 2 3 6 4 ⁵
6 4 5 2 3 ⁵	5 6 3 4 2 ⁵	3 5 2 6 4 ⁵

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CALL HER RIGHT, THREE TIMES.

2 3 4 5 6	2 3 4 5 6	2 3 4 5 6
<u>3 5 6 4</u> 2 ³	2 3 5 6 4 ¹	4 2 3 5 6 ⁵
6 3 5 4 2 ⁵	5 2 3 6 4 ⁵	3 4 2 5 6 ⁵
5 6 3 4 2 ⁵	3 5 2 6 4 ⁵	2 3 4 5 6 ⁵

Each of these six touches, excepting the last, runs out at a plain lead.

The tenor the Observation, unless another bell be named as such:—

2 Courses by the
Lead-ends.

2 3 4 5 6
B 2 3 5 6 4
3 6 2 4 5
6 4 3 5 2
4 5 6 2 3
B 4 5 2 3 6
B 4 5 3 6 2
5 6 4 2 3
6 2 5 3 4
2 3 6 4 5
B 2 3 4 5 6

Call, once the wrong, and once the right repeated.

3 Courses by
Lead-ends.

2 3 4 5 6
3 5 2 6 4
5 6 3 4 2
6 4 5 2 3
4 2 6 3 5
B 4 2 3 5 6
2 5 4 6 3
5 6 2 3 4
6 3 5 4 2
3 4 6 2 5
B 3 4 2 5 6
4 5 3 6 2
5 6 4 2 3
6 2 5 3 4
2 3 6 4 5
B 2 3 4 5 6

Call a Bob when 5 and 6 dodge together behind.

5 Courses by
Bob Changes.

2 3 4 5 6
2 3 5 6 4 ¹
4 5 2 3 6 ⁴
2 4 5 3 6 ⁵
5 2 4 3 6 ⁵
5 2 3 6 4 ¹
3 5 2 6 4 ⁵

Once the wrong; thrice the right; and twice the wrong.

72c. Call when the 6th dodges
behind, unless the 5th
be with her.

Then a single.

2 3 4 5 6

2 3 5 6 4¹

4 5 2 3 6⁴

4 5 3 6 2¹

3 4 5 6 2⁵

2 5 3 4 6⁴

2 5 4 6 3¹

4 2 5 6 3⁵

3 5 4 2 6⁴

3 5 2 6 4¹

s 2 4 3 5 6⁴

Repeated.

One the wrong, one the right, and one the wrong;
twice repeated.

5th, the Observation.

Call when she is behind,
unless the 6th be with her.

Then a single.

2 3 4 5 6

6 4 2 3 5

6 4 3 5 2

2 3 6 4 5

6 2 3 4 5

6 2 4 5 3

3 4 6 2 5

6 3 4 2 5

6 3 2 5 4

4 2 6 3 5

s 2 4 3 5 6

Repeated.

One the right, one the wrong, and one the right;
twice repeated.

XVII.—**Changes upon Seven Bells,—5040 in number. Grandsire Triples.**—Everything which has been said of grandsire-doubles applies, so far as it goes, to grandsire-triples. The man who has learned to ring upon five bells, has only to become accustomed to the increased number of ropes and to the additional dodging in six-seven, he will then be able to ring upon seven bells.

THE COURSE BELL is a very valuable aid in ringing upon seven bells and upwards; it can be employed in all methods and upon all numbers. The course-bell is that which you turn away from behind; she will be your guide from that moment until you come down to the lead. Keep your eye upon the bell which you turn from the last place.

At every change allow one bell to strike between that bell and your own until you see and hear her (your course bell) lead ; then strike her at the back stroke as you come down into two, and lead yourself. If the first lead of the plain course be studied it will be seen that, the 7 courses 6, 5 courses 7, treble courses 5, 2 courses treble, 3 courses 2, and 4 courses 3.

The course-bell will be useful at other times also, besides while hunting. If ever you are in perplexity as you are coming down, look for your course-bell and follow her down, allowing one bell to strike in between her and your own bell ; she will guide you safely down to the lead.

At the same time, I believe that men who have once learned to ring by counting their place, will work by that rule in preference to any other, and will employ the course-bell only when in doubt. It is nevertheless of great value to conductors ; and a mistake can often be corrected by directing the man in error to course such and such a bell. I have not mentioned the course-bell earlier, because my belfry experience has made me feel very strongly the danger of entrusting a beginner with any ' aids ' whatever. Men trust to them and to memory, and thus fail to acquire any real or intelligent grasp of the subject. Shipway mentions, as a frequent occurrence in his day, that men followed their course-bell with so little attention, that while they allowed time for another to strike between her and their own, they were altogether ignorant which bell

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thus interposed. I believe that one chief reason why, out of all the many men in England who can ring, so few comparatively either can ring well or ever will do so, is, that they are insufficiently grounded at the outset. They work by a 'rule of thumb' which they do not understand, and therefore cannot vary, nor apply to any method but that for which it is taught to them. And no man can become a really good ringer unless he will take the trouble to understand the work which he has to do, and will learn how to do it for himself, without depending on another to show him the way.

THE RULE OF THE METHOD upon seven bells is exactly the same as upon five ; so also are the rules for making bobs and singles. Therefore I refer my reader to the chapter on 'Grandsire-Doubles.'

I now give three examples, viz. the first lead and the lead-ends of (A) the plain-course ; and the lead-ends of (B) a bob, and of (C) a single, interposed between plain leads.

Changes upon Seven Bells.

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A							B						
1	2	3	4	5	6	7	1	2	3	4	5	6	7
2	1	3	5	4	7	6	1	2	5	3	7	4	6
2	3	1	4	5	6	7	&c., &c.						
3	2	4	1	6	5	7	6	4	7	3	1	5	2
3	4	2	6	1	7	5	6	7	4	1	3	2	5 _B
4	3	6	2	7	1	5	7	6	1	4	2	3	5
4	6	3	7	2	5	1	7	1	6	2	4	5	3
6	4	7	3	5	2	1	1	7	6	4	2	3	5
6	7	4	5	3	1	2	1	6	7	2	4	5	3
7	6	5	4	1	3	2	* * *						
7	5	6	1	4	2	3	1	6	4	7	3	2	5
5	7	1	6	2	4	3							
5	1	7	2	6	3	4							
1	5	2	7	3	6	4							
1	2	5	3	7	4	6							
* * *													
1	2	7	5	6	3	4	1	2	3	4	5	6	7
* * *													
1	2	6	7	4	5	3	1	2	5	3	7	4	6
* * *							* * *						
1	2	4	6	3	7	5	1	7	6	2	4	5	3 _S
* * *							* * *						
1	2	3	4	5	6	7	1	7	4	6	3	2	5

TO RING BY MEETING THE TREBLE.

(1.) At a plain lead.

If you meet her in one-two, make third's place and return to the lead.

If you meet her in two-three, dodge in four-five as you go up.

If you meet her in three-four, dodge in six-seven as you go up.

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If you meet her in four-five, dodge in six-seven as you come down.

If you meet her in five-six, dodge in four-five as you come down.

If you meet her in six-seven, run in the plain hunt.

(2.) At a Bob.

If you meet the treble in one-two, make third's place, and return to the lead.

If you meet the treble in two-three, make third's place and return to the lead.

If you meet the treble in three-four, dodge twice in four-five up.

If you meet the treble in four-five, dodge twice in six-seven up.

If you meet the treble in five-six, dodge twice in six-seven down.

If you meet the treble in six-seven, dodge twice in four-five down.

(3.) At a Single.

If you meet the treble in one-two, make second's place and lead again.

If you meet the treble in two-three, make third's twice over, and return to the lead.

If you meet the treble above third's place, work as at a bob.

TO RING BY THE COURSE-METHOD.—After making third's place, dodge in four-five down, then in six-seven down, next in six-seven up, and then in four-five up. A bob or a single shortens this work by one lead; but there are, as in grandsire-

doubles, bells to which this does not apply, viz. At a Bob, that which the call throws out of the hunt, that which the call throws into the hunt, and that which, in its regular work, was about to make third's place and go to the lead again. At a Single, the first two of these three.

See also the explanations given at pp. 42, 43. A bell may be in the hunt for five leads.

The learner will notice that the course-method is of much greater use on seven bells than on five, or six, because of the increased length of the course. I would urge him to be on the watch for all memoranda which may help him in his work, *e.g.* to notice which bell is in the hunt after each call (it is that met next after the treble), which bell he is coursing, and the place in which he meets the treble when he has finished dodging.

TO KNOW THE BELL WITH WHICH TO DODGE.—If you dodge in six-seven up, your partner will be the bell which you took off the lead, *i.e.* your course-bell ; if in six-seven down, the bell which took you off the lead. If in four-five up, your partner will be at a plain lead, the bell which you meet next but one after meeting the treble, *i.e.* next after the bell in the hunt ; but if there be a call, then the bell which you meet next after the treble, *i.e.* that which is called out of the hunt. If you dodge in four-five down, your partner is the bell which you see in the fourth place when you strike in the fifth. If you cannot find her, then dodge by counting alone, until, at your last dodging blow in

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fourth's, you strike the treble, which warns you to go down to the lead at once.

It will be of use to notice also which bells you may neglect, as those with which it is impossible that you should have to dodge, and the place in which you meet the treble after dodging in six-seven, both up and down, so as to be assured that you are doing right. But I fear lest I should perplex if I give too many directions.

ON PRICKING AND CONDUCTING TOUCHES.—The short method of pricking, which has been explained in the chapter on bob minor, can be applied to grandsire triples also. If, in the plain course, we compare the round with the first lead end,

$$\begin{array}{ccccccc} 2 & 3 & 4 & 5 & 6 & 7 & . \\ \hline 2 & 5 & 3 & 7 & 4 & 6 \end{array}$$
 ; we see at once that the latter is pro-

duced from the former by this formula :—‘Move the bells from 2 to 2, 3 to 4, 4 to 6, 5 to 3, 6 to 7, 7 to 5.’ And that all the five lead ends can thus be written off, each from that which preceded it : but pricking becomes very complicated when bobs are introduced.

DEFINITIONS.—The bell which, at the back-stroke lead of the treble, strikes in the second place, is said to be ‘in,’ because she is ‘in the hunt with the treble.’

That which strikes in the third place, is said to be ‘before,’ because she has just made third’s and is going to lead again.

In the fourth place, is said to be ‘out,’ because

that is the position into which a bell is brought when compelled by the call to dodge twice in four-five down, and go out of the hunt.

In the fifth place, is said to be 'in the middle,'—she is dodging in four-five up.

In the sixth place, is said to be	} These two expressions are explained in Chapter XVI.
'wrong.'	
In the seventh place, is said to be	
'right,' or 'home.'	

Expressed briefly :—

In.	Before.	Out.	Middle.	Wrong.	Right or Home.
2	3	4	5	6	7

Now prick the first lead with a bob, and compare the two rows of figures.

From rounds we get $\begin{array}{ccccccc} 2 & 3 & 4 & 5 & 6 & 7 \\ \hline B & 7 & 5 & 2 & 6 & 3 & 4^1 \end{array}$; and it is evident that by means of the bob the following alterations have been produced :—

The bell which was in the position known as 'in,' *i. e.* in the hunt, has been called to the position known as 'out,' *i. e.* has been called 'out of the hunt.'

The bell which was 'before,' has been called to 'the wrong.'

The bell which was 'out,' has been called to 'the right,' or 'home.'

The bell which was 'in the middle,' has been called 'before.'

The bell which was 'wrong,' has been called 'to the middle.'

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The bell which was 'right,' or 'home,' has been called 'in,' or 'into the hunt.'

Now, let the learner write out for himself the table, which shows the effect produced by a bob, and also the rule of the touch which he wishes to prick, thus :—

In.	Before.	Out.	Middle.	Wrong.	Right Home.
2	3	4	5	6	7
7	5	2	6	3	4

And as an example 'call the 7th before, wrong and home. Repeated.'

Let him then prick from lead end to lead end, by the directions given above ; and as each row of figures is produced let him notice whether the observation bell has come into such a position that the bob will bring her, at the next lead end, into the position required by the rule of that touch, thus :—Call the 7th before, wrong and home. Repeated.

2	3	4	5	6	7	
2	5	3	7	4	6	{ The 7 is now in the 'middle;' therefore call a Bob, because it will bring a bell from 'the middle' to the position 'before.'
6	7	2	4	5	3 ² B	
3	4	6	5	7	2 ¹ B	{ The 7 is now before ; so call a Bob to bring her 'wrong.'
3	5	4	2	6	7	
3	2	5	7	4	6	
3	7	2	6	5	4	
3	6	7	4	2	5	{ The 7 is now 'out;' therefore call a Bob to bring her 'home.'
5	4	3	2	6	7 ⁶ B	

The small figures indicate the number of leads between the calls, also the number of leads during which the bell in the hunt remains in the hunt.

This touch contains 16 leads ; the learner should complete the other half for himself. Any similar touch can be pricked in the same manner, *e.g.* Call 5 twice before, and twice in the middle, repeated.

There is another mode of pricking much shorter, but not nearly so useful to the beginner.

A single is produced from the bob-change by transposing the bells in the second and third places, thus :—

6 7 2 4 5 3 B
7 6 2 4 5 3 S

But I do not think it necessary to say much about singles at present, because a half peal, or 2520 changes, can be obtained by bobs alone.

ON CONDUCTING.—Two expressions remain to be explained, viz., To call a bell into a certain place ‘with a double,’ means that you call by the position of the observation bell, so as to bring her into the place specified, and that you call again at the next lead, no matter what the position of the observation.

To call the observation ‘in and out at two, or at three, &c.,’ means that she is to be called into the hunt, and called out again, at the second or the third lead, &c., after she has been called in.

THE CONDUCTOR'S MEMORANDA.

If told to call the Observation Bell.		Call the lead after		When coursing the Treble.	
Out of the Hunt . . .	.	Out of the Hunt . . .	.	Out of the Hunt . . .	.
Into the Hunt with a Bob .	.	Into the Hunt with a Bob .	.	Into the Hunt with a Bob .	.
Before . . .	.	Before . . .	.	Before . . .	.
Middle . . .	.	Middle . . .	.	Middle . . .	.
Wrong . . .	.	Wrong . . .	.	Wrong . . .	.
Home . . .	.	Home . . .	.	Home . . .	.
Into the Hunt with a Single .	.	Into the Hunt with a Single .	.	Into the Hunt with a Single .	.
Before with a Single . . .	.	Before with a Single . . .	.	Before with a Single . . .	.

Dodging in six-seven up.

Dodging in four-five up, or the Middle.

Dodging in the six-seven down, or the Wrong.

Making third's place.

Dodging in four-five down.

Dodging in four-five up, or the Middle.

Dodging in six-seven up, or the Right.

The above table was first published by Mr. Troyte in 1869 ; it should be studied carefully, and it may be summed up thus : out, when coursing, in, after six-seven up, before, after four-five up, middle, after six-seven down, wrong, after third's, home, after four-five down.

If a man notices the place in which he meets the treble when coming down, he will be able to know by his own bell the moment at which the treble is about to strike in third's place, and therefore the moment at which the call is due. See page 45. The condensed memoranda for triples are as follows :—

Meet treble when in seven, call when in two, in six after leading ; five, three ; four, five ; three, seven ; two, six down.

When men have rung the plain course, the next step is to ring the three courses ; this is given below, together with a few other simple touches for practice. The two touches which I selected as illustrations of the mode of pricking will be useful for this purpose also. But as soon as a company of ringers begins to make progress, they will need some book more advanced than mine.

The course of triples contains five leads (see p. 39) ; but the three courses contain only twelve leads, or 168 changes ; because there are three bobs, each of which shortens the course by one lead.

Touches of Grandsire Triples given by the Bob Changes :

168.

2 the Observation.

Call her, out, in and out, in and
out, in.

168.						
2	3	4	5	6	7	
3	4	2	5	6	7 ⁴	
4	2	3	5	6	7 ⁴	
2	3	4	5	6	7 ⁴	

Call 7 Home three times.

2	3	4	5	6	7
7	5	2	6	3	4 ¹
2	3	7	5	4	6 ³
6	5	2	4	3	7 ¹
2	3	6	5	7	4 ³
4	5	2	7	3	6 ¹
2	3	4	5	6	7 ³

350.

Call the 3rd, 4th, 5th, 6th, or 7th, Before
five times, *e.g.* the 5th.

2	3	4	5	6	7
7	5	2	6	3	4 ¹
6	5	7	4	2	3 ⁵
4	5	6	3	7	2 ⁵
3	5	4	2	6	7 ⁵
2	5	3	7	4	6 ⁵

The last call brings the bells back into the plain course at the change, which was prevented from coming up by the first bob, and of course rounds come at the fourth lead end without a call.

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350.

7th Observation.

Call her, in and out at 2, five times.

2	3	4	5	6	7
7	5	2	6	3	4 ¹
3	4	7	2	6	5 ²
7	6	3	4	5	2 ³
5	2	7	3	4	6 ²
7	4	5	2	6	3 ³
6	3	7	5	2	4 ²
7	2	6	3	4	5 ³
4	5	7	6	3	2 ²
7	3	4	5	2	6 ³
2	6	7	4	5	3 ²

This is the third lead end in the plain course, and the touch runs out without a call in two more leads.

The next is a very musical touch in three parts, taken from Mr. Hubbard's work. The calling is the same in each part, but is applied to a different bell in each part, viz., in the first part to the 7th, in the second part to the bell which at the first part end occupies the same place as the 7th in rounds, viz., the 6th, and similarly in the third part to the 4th.

504.

2 3 4 5 6 7	3 5 7 2 4 6	5 2 6 3 7 4
7 5 2 6 3 4 ¹	6 2 3 4 5 7 ¹	4 3 5 7 2 6 ¹
5 2 7 6 3 4 ⁴	2 3 6 4 5 7 ⁴	3 5 4 7 2 6 ⁴
7 3 5 2 4 6 ³	6 5 2 3 7 4 ³	4 2 3 5 6 7 ³
3 5 7 2 4 6 ⁴	5 2 6 3 7 4 ⁴	2 3 4 5 6 7 ⁴
1st part end.	2nd part end.	3rd part end.

1st part, 7th in and out at 4. Repeated.

2nd part, 6th " " "

3rd part, 4th " " "

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It is hoped that this arrangement of the parts (in which each part end is carried forward successively) will attract the attention of the young conductor to the regularity of the calling. He will also observe that the touch may be called by this observation.

1st part. The 4th twice right and twice wrong.

2nd part. The 7th. Ditto.

3rd part. The 6th. Ditto.

Or again,

1st part. The 6th twice middle and twice right.

2nd part. The 4th. Ditto.

3rd part. The 7th. Ditto.

Again, it may be called by one bell throughout, *e. g.*, by the 4th.

1st part. Twice right, twice wrong.

2nd part. Twice middle, twice right.

3rd part. In and out at four, twice.

Or by the sixth.

1st part. Twice middle, twice right.

2nd part. In and out at four, twice.

3rd part. Twice right, twice wrong.

Or by the seventh.

1st part. In and out at four, twice.

2nd part. Twice right, twice wrong.

3rd part. Twice middle, twice home.

The part ends of the 1st and 2nd parts of this touch are known respectively as the Queen's change

Changes upon Seven Bells.

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and Tittums change, and are universal favourites. The shortest touch into which they can be both introduced is one of 168 changes, produced by calling a single every second lead.

The next touch is one of 504 changes, in three parts, the parts placed side by side for the learner to see how they may be called.

2 3 4 5 6 7	3 4 2 5 6 7	4 2 3 5 6 7
<u> </u>	<u> </u>	<u> </u>
4 6 2 3 7 5 ³	2 6 3 4 7 5 ³	3 6 4 2 7 5 ³
7 5 4 2 3 6 ²	7 5 2 3 4 6 ²	7 5 3 4 2 6 ²
6 2 7 3 5 4 ¹	6 3 7 4 5 2 ¹	6 4 7 2 5 3 ¹
3 2 6 4 7 5 ⁶	4 3 6 2 7 5 ⁶	2 4 6 3 7 5 ⁶
One plain lead.	Plain lead gives	Plain lead.
3 4 2 5 6 7	4 2 3 5 6 7	2 3 4 5 6 7
1st part end.	2nd part end.	

Observe 5, 6, 7, all come into their places at the part end, and each does the same work in the 2nd and 3rd parts that it did in the 1st; hence any one of the three may be used as the observation; thus, call the 7th wrong, in and out, wrong, twice repeated; or call the 6th before, right with a double, out at 5, twice; or call the 5th right, before with a double, right, twice.

In the remaining touches it will be enough to give the first part only.

672 in three parts. Sixth the observation. Call her before with a double, in and out, in and out, before with a double, twice repeated.

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2 3 4 5 6 7

4 6 2 3 7 5³

5 3 4 7 6 2¹

6 2 5 4 7 3²

3 4 6 7 2 5¹

6 2 3 4 5 7³

7 4 6 5 2 3¹

4 6 7 5 2 3⁴

3 5 4 2 6 7¹

672, in three parts.

2 3 4 5 6 7

7 5 2 6 3 4¹

4 6 7 3 5 2¹

7 5 4 6 2 3³

3 6 7 2 5 4¹

6 7 3 2 5 4⁴

4 2 6 5 7 3¹

6 7 4 2 3 5³

5 2 6 3 7 4¹

Plain lead.

5 3 2 4 6 7

Part end.

882, in three parts.

2 3 4 5 6 7

7 5 2 6 3 4¹

2 3 7 5 4 6³

7 4 2 3 6 5³

5 3 7 6 4 2¹

6 3 5 2 7 4⁵

3 5 6 2 7 4⁴

4 2 3 7 5 6¹

3 5 4 2 6 7³

Part end.

This may also be called by the 7th, thus :

Wrong with a double,

Wrong with a double,

Home with a double,

Out at four leads and Home,

Twice repeated.

Call 7th.

In and out twice,

Before with a double twice.

All repeated twice.

Or call sixth,

Middle with a double twice,

In and out, twice.

All repeated twice.

Call 7th.

In and out at three, in and out.

Wrong twice.

Middle and right,

All twice repeated.

Changes on Eight Bells.

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A conductor often learns by heart, and carries in his memory the position of the bells at each part end, he then satisfies himself by a glance round the belfry at those times that the touch is being rung without any mistake. To describe his work when mistakes do occur is quite beyond the scope of this book.

XVIII. — Changes on Eight Bells, 40,320 in Number.—BOB MAJOR.—The rules of both the method and for making the bob are exactly the same as in bob minor; therefore it is unnecessary to print more than the lead-ends of the plain course. As 13,440 changes can be obtained by bobs alone, and with bell 7 coursing bell 8 throughout, it is unnecessary to employ the single, and the 'two tenors' (as they are often called) are never separated. Hence the work is much simplified; the course method of ringing is used with increased advantage owing to the increased length of the plain course, and the use of the course bell becomes almost necessary, owing to the greater number of ropes.

Lead ends of the Plain Course.							
2	3	4	5	6	7	8	
<hr/>							
3	5	2	7	4	8	6	
5	7	3	8	2	6	4	
7	8	5	6	3	4	2	
8	6	7	4	5	2	3	
6	4	8	2	7	3	5	
4	2	6	3	8	5	7	
2	3	4	5	6	7	8	

TO RING BY MEETING THE TREBLE.—(1.) The plain course.

If you pass the treble in one-two, make second's place and lead again.

If you pass the treble in two-three, dodge in three-four up.

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If you pass the treble in three-four, dodge in five-six up.

If you pass the treble in four-five, dodge in seven-eight up.

If you pass the treble in five-six, dodge in seven-eight down.

If you pass the treble in six-seven, dodge in five-six down.

If you pass the treble in seven-eight, dodge in three-four down.

(2.) At a Bob.

If you pass the treble in one-two, hunt out behind.

If you pass the treble in two-three, make fourth's place and return to the lead.

If you pass the treble in seven-eight, hunt down to the lead.

If you pass her in any other place, work as in the plain course.

TO RING BY THE COURSE METHOD.—After making second's place, dodge in three-four down, in five-six down, in seven-eight down, then in seven-eight up, in five-six up, and in three-four up.

A Bob lengthens this work by one lead as in bob minor (which see).

ON PRICKING AND PRINTING PEALS, &c.—The plain lead ends can be found, each from the lead end preceding it, by this formula. Transfer the bells, from two to four, four to six, six to eight, eight to seven, seven to five, five to three, three to two.

Changes on Eight Bells.

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At a Bob change : two to two, three to three, five to four ; the rest as above.

In Bob Major the tenor is invariably the observation bell, and she is called so, that at the back-stroke lead of the treble she shall occupy one of four places, viz., ' Before,' ' Middle,' ' Wrong,' ' Right or Home,' which are the places occupied respectively by the 3rd, 6th, 7th, and 8th bells in rounds, thus :

		Before.			Middle.	Wrong.	Right or Home.
1	2	3	4	5	6	7	8

As we prick from lead end to lead end, we must notice whether the observation bell has come into such a position that the bob will bring her, at the next lead end, into the position required by the rule of the touch. Therefore, if we are told to call the observation (1) Before, (2) Middle, (3) Wrong, or (4) Right, we must call the lead after she has been in (1) the third place, (2) the fourth, (3) the eighth, or (4) the sixth place at the lead end. Hence these memoranda :

If told to call her	Before	call the lead after she has	dodged in three-four up
	Middle		" " down
	Wrong		" seven-eight down
	Right or Home		" five-six down

Touches and peals of Bob Major are given, in order to save printing, not by the lead ends but by the course ends, that is, the lead ends at which the two tenors (*i.e.*, 7 and 8) are both at home in their own places, 7 and 8; then also the figures are reduced to five in number by omitting those which represent these tenors as well as the treble; thus, 5 2 4 3 6 is an abbreviation for the lead end, 1 5 2 4 3 6 7 8.

After a call has been made the bells are supposed to run on till a course end turns up, which is then recorded as resulting from the call, for instance: call the tenor wrong, and let the bells run on; we get this result expressed in the lead ends.

2 3 4 5 6 7 8

2 3 5 7 4 8 6 A Bob 1st lead produces the 'wrong.'

3 7 2 8 5 6 4

7 8 3 6 2 4 5

8 6 7 4 3 5 2

6 4 8 5 7 2 3

4 5 6 2 8 3 7

5 2 4 3 6 7 8

This last change is written 5 2 4 3 6, and is called the course end resulting from a bob the wrong.

The following course ends result from the bobs noted against each.

A Bob before results in	1 3 5 2 6 4 7 8,	written	3 5 2 6 4
A Bob wrong	„ 1 4 3 6 7 8	„	5 2 4 3 6
A Bob middle	„ 1 4 3 6 5 2 7 8	„	4 3 6 5 2
A Bob home	„ 1 4 2 3 5 6 7 8	„	4 2 3 5 6

Changes on Eight Bells.

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Bobs wrong and middle

result in . . . 1 4 2 6 3 5 7 8, written 4 2 6 3 5

Bobs wrong and home

result in . . . 1 4 5 2 3 6 7 8 „ 4 5 2 3 6

Bobs wrong, middle,

and home result in . 1 6 4 2 3 5 7 8 „ 6 4 2 3 5

Bobs middle and home

result in . . . 1 6 4 3 5 2 7 8 „ 6 4 3 5 2

The expressions Wrong, Before, Middle, and Home, are denoted by their initial letters, W, B, M, and H, and a whole touch would be

720.	W. B. M. H.
4 2 5 6 3	- - -
3 5 4 2 6	- - -
Twice repeated.	

In which each (—) would indicate a bob calling the tenor into the position pointed out by the letter above. So that the instructed ringer would understand that the tenor is called Before, Middle, and Home, and that these calls result in the course end, 1 4 2 5 6 3 7 8. She is then called Wrong, Middle, and Home, which results in the course end, 1 3 5 4 2 6 7 8, and that, when the whole has been twice repeated, the bells will come round at the 720th change.

Starting with rounds	2 3 4 5 6	we find a Bob before
gives course-end	3 5 2 6 4	this the Bob Middle
changes into	2 5 4 6 3	this the Bob Home
changes into	4 2 5 6 3	as given. The Bob
Wrong produces	6 4 5 2 3	Middle give us
	5 4 3 2 6	Home produces
	3 5 4 2 6	the Part-end given.

Repeating the calling for the 2nd part,

Bob before changes 3 5 4 2 6 into 5 2 3 6 4

Bob Middle . . . gives 3 2 4 6 5

Bob Home . . . gives 4 3 2 6 5

Bob Wrong, Middle, and Home

(see table) gives 5 2 4 3 6,

which is the Second Part end.

Repeating calling the third time as before.

Bobs before middle and home turn 5 2 4 3 6 into 4 5 3 6 2.

Bobs wrong, middle, and home turn 4 5 3 6 2 into 2 3 4 5 6 or rounds.

The Part ends can be found, each from its predecessor, by transferring the bells on the same principle which has been applied to the lead ends of the plain course. Thus: the calling of the first part of the above touch

turns 2 3 4 5 6

into 3 5 4 2 6. Transfer the bells by the same rule; and we obtain 5 2 4 3 6 the second part end. Repeat the process, and we obtain 2 3 4 5 6 the third part end.

Thus all that is necessary to describe to the initiated a touch of 720 changes on eight bells can be printed in three lines of five figures each, whereas the full lead ends of each part would require fifteen lines of eight figures each, or forty-five such lines in all.

In the same manner the calling of 5040 can be indicated most clearly in a very small compass, as in the following peal by H. Hubbard.

Changes on Eight Bells.

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W.	M.	H.		2	3	4	5	6	
I	I	I	gives	6	4	2	3	5	Since this calling turns 2 3 4 5 6
I			„	3	6	2	4	5	into 6 2 3 4 5, when repeated
I			„	4	3	2	6	5	it gives these part ends in
I	I		„	2	6	4	3	5	succession, viz. :
I			„	3	2	4	6	5	5 6 2 3 4
I			„	6	3	4	2	5	4 5 6 2 3
I	I		„	4	2	6	3	5	3 4 5 6 2
I			„	3	4	6	2	5	2 3 4 5 6
I	I		„	6	2	3	4	5	the first part end.
Four times repeated.									

Figures are often used instead of dashes to express the bobs, and when the same kind of bob is used twice in succession it is denoted by the figure 2, as in the following example.

A DATE TOUCH, 1856, BY H. HUBBARD.

W.	B.	M.	H.	2	3	4	5	6	
	2		I	3	5	6	4	2	{ i.e. two bobs before, and one home, bring up this course end.
			I	6	3	5	4	2	
			I	5	6	3	4	2	
I			I	3	4	5	6	2	
			I	5	3	4	6	2	
I		I	I	2	4	5	3	6	
			I	5	2	4	3	6	
			I	4	5	2	3	6	
									Repeated.

The Part ends.

Since the above calling from . . . 2 3 4 5 6
 gives 4 5 2 3 6
 When repeated we have . . . 2 3 4 5 6

As in bob minor, calls are made when the treble is about to strike in the second place, and if the conductor takes notice of the position in which he meets the treble as he comes down to the lead, he will be able to tell readily by his own bell the moment at which the call is due.

TOUCHES FOR PRACTICE.

I.	224.	W.	B.	M.	H.
	4 5 2 3 6	I			I
	2 3 4 5 6	I			I
II.	224.	W.	B.	M.	H.
	6 4 3 5 2			I	I
	2 3 4 5 6			I	I
III.	240.	W.	B.	M.	H.
	4 5 3 6 2	I	I	I	I
	2 3 4 5 6	I		I	I
IV.	336.	W.	B.	M.	H.
	4 2 3 5 6				I
	3 4 2 5 6				I
V.	336.	W.	B.	M.	H.
	5 2 4 3 6	I			
	3 5 4 2 6	I			
	2 3 4 5 6	I			
VI.	336.	W.	B.	M.	H.
	4 3 6 5 2			I	
	6 3 2 5 4			I	
	2 3 4 5 6			I	
VII.	448.	W.	B.	M.	H.
	4 2 6 3 5	I		I	
	5 6 4 2 3	I		I	I
					Repeated.

On Raising and Falling.

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VIII.	560.	W.	B.	M.	H.
4	5 2 3 6	I			I
2	4 5 3 6				I
5	2 4 3 6				I
3	5 4 2 6	I			
2	3 4 5 6	I			
IX.	720.	W.	B.	M.	H.
4	5 3 6 2	I	I	I	I
3	4 2 5 6	I		I	
Twice repeated.					
X.	Five courses.	W.	B.	M.	H.
6	4 2 3 5	I	I	I	
5	2 6 4 3	I	I	I	
3	6 5 2 4	I	I	I	
4	5 3 6 2	I	I	I	
2	3 4 5 6	I	I	I	

XIX.—On Raising and Falling, or Ceasing in Peal.
 —Bells should be ‘rung down’ at the conclusion of each practice, and left with their mouths downwards. To leave them ‘set’ is, generally speaking, an idle and also a dangerous habit, especially where the ropes hang down to the ground-floor near a door of the church; ignorant persons may easily ‘pull a bell off,’ and meet with a bad or possibly even fatal accident. If it be necessary to leave the bells ‘upon their stays,’ the ropes should be secured under lock and key.

The learner should begin his practice on a bell when ‘set,’ and not trouble himself with raising her until he has acquired some proficiency. He may then take some lessons, the clapper being free, from

an experienced ringer. He will do well to watch the bell as she rises, and also his instructor as he works, so as to see both what is done and how it is done. He must next be shown how to hold the rope in his left hand, and practise until he acquires the knack of pulling correctly and of checking correctly, so as to regulate the swing of the bell in both directions, and also to let her take up the rope from the coil in his left hand, inch by inch, in the exact quantities required. Then let him raise, and fall the bell repeatedly, but always very gradually, so as to make each operation last several minutes.

Before the learner join the company 'to raise or fall in peal,' he may with advantage station himself in the bell-chamber and watch the bells while that feat is performed by the others. He will observe that each bell is swung through portions of the circle larger and larger continuously, or, in other words, is rung higher and higher, until she reaches a position in which she will balance mouth uppermost. The clapper strikes twice in each such motion, viz., at the moments when the bell has reached the highest point to which she is then about to go, and just before she begins to descend. The higher the bell rises, the more slowly will the clapper strike, that is, there will be a longer interval of time between any two blows; the lower the bell is rung the more quickly will the blows succeed each other. The ringer, by pulling his rope, can send the bell as much higher as he may wish, and

cause the clapper to strike slowly, or, by checking his rope, he can stop her ascent, and thus cause the clapper to strike at any instant which he may choose; at the same time, he, by so doing, causes the bell to drop and the blows of the clapper to follow one another more quickly.

Thus, as bells are raised, the time in which they are struck is at first very quick indeed, and gradually becomes more slow; as they are lowered, the time gradually becomes so extremely quick that it cannot be counted. The object is, of course, that the performance be throughout perfectly regular, and then the effect is extremely musical.

In actual ringing, the practitioner must watch the ropes and hands of the men below him, because to check correctly is as important as to pull in exact time and with the exact force. It is also necessary when the bell is low to pull and to check at each blow, because the clapper will otherwise swing inside the bell without striking.

In raising, if the practitioner find that his bell is too quick, *i. e.*, striking too near that next smaller than his own, he must pull a little harder. But if too slow, *i. e.*, too near that next larger, he must not check the rope, but endeavour to keep on at exactly the same rate: for this reason; all the bells are rising, hence the larger are going away from him and the smaller are coming up to him. Therefore, if he can only remain stationary, he will soon find himself striking at the correct interval. He must then go on with the rest. In the same

manner in falling, if he find his bell too quick, *i. e.*, too near those below him, she is too low, and he must, as before, endeavour to remain stationary until he hear his bell striking in right time; because as all the bells are going down, those below are going away from his, and will soon widen the interval if allowed to do so.

If the man next below get out of time, the learner cannot help and must not follow him; but must watch the bell next but one below his own and follow that; allowing, by ear, a space of time sufficient for his immediate neighbour to strike in between, if he can succeed in regaining his place.

It is unwise for one, not fully master of his bell, to raise her in peal, because to commence the evening badly is vexatious and dispiriting; also because a beginner in this work may gall his hands quite sufficiently to mar his after performance.

XX.—Rules for Ringing Societies.—As I have frequently been consulted on Rules for Ringers, I give the following specimen. These rules in their present shape are in use in a Municipal Town, which contains two Parish Churches, each possessing a fine ring of bells; but they embody the result of many careful experiments, extending over several years in both town and country parishes. See also Chapter XXII.

In some places it will be necessary to provide, under Rule 6, for the payment of wages forfeited in

order to ring. But this is better avoided if possible, and, when necessary, all wages should be paid at one uniform rate ; this is imperative, and the rate should be clearly understood and embodied in some rule or bye-law. The bye-laws afford a ready means of dealing with local circumstances : all money matters must be clearly understood from the very beginning.

THE HERTFORD CHANGE-RINGERS.

RULES.

1. That this Society consist of Ringing Members who attend practice, and of Honorary Members who subscribe not less than Ten Shillings and Sixpence annually to its funds.

2. That the Mayor of Hertford be President during his year of office. That the Clergy and Churchwardens of the Churches of St. Andrew and All Saints be Vice-Presidents *ex officio* ; and such other Official Persons as the Society shall appoint, by special vote, be Members.

That the management of the Society be vested in a Committee, to consist of six Members, one of whom shall be Secretary, elected by the Society ; and the Chairman, who shall be the Rector of St. Andrew's.

3. That the Annual Meeting of the Society be held in the Month of November, to audit the accounts and on general business. That at each such Annual Meeting all elected officers vacate their offices, but be capable of re-election. And that a special Meeting may be summoned, at the request of any three Members in the manner directed by the Bye Laws (Rule 8) ; but at such Special Meeting no business be transacted excepting that for which it is summoned, which shall be duly notified to all Members. All votes shall be taken by ballot.

4. Minutes shall be kept of the proceedings at all Meet-

ings ; also a Register of the Attendance of Members at practice. Any Ringing Member who shall be absent for three consecutive weeks shall be considered to have left the Society, and must be re-elected ; except in the case of illness or absence from Hertford. But it shall be in the power of the Society, by special vote, to grant exemption from this Rule for a definite time.

5. Candidates for admission must be proposed and seconded, their names entered in the Minute-book, and announced to the Society. They may then be admitted at the next practice night as probationers for one or two months ; during which time the Proposer and Secunder are to take part in instructing them. Probationers to be elected into the Society by the Ringing Members only. One black ball in four to exclude.

6. All fees earned by the Society for ringing are to be divided into equal portions, so as to allow of their being distributed as follows, viz. :—

The Bell Box to receive one share.

A Probationer, half a share.

Any Ringing Member who rang once only, that is to say, in the morning or evening alone, while others rang twice (*i.e.* in the morning and evening) or more than twice, half a share.

The remainder of those who rang, one share each.

Each Ringing Member shall have a right to ring on these occasions, if present ; and to take precedence in the ringing of a Probationer.

7. The Bell Box shall bear the expense of any ringing expedition or festival.

8. Bye Laws may be made, after due notice to all Members, at a Special Meeting summoned for the purpose ; such Bye Laws shall regulate all matters relating to the affairs of the Society for which no express provision is made in these Rules ; but they shall be reconsidered at the General Meeting next ensuing.

9. Any Member of this Society who shall take part in

any ringing in Hertford with any Band of Ringers not being members of this Society, on any occasion when a fee is given, shall be liable to expulsion.

XXI. The Church Tower.—The opinion was expressed, by a late Astronomer Royal, that a tower which will stand any wind which blows, will carry also any bells which are likely to be hung. I believe this to be the simple truth, and that no well-built and sound tower is injured by bells well hung. If a tower become unsafe, the causes will be some such as those which actually brought down that of Chichester in 1861, and from which that of St Albans was only just preserved a few years later. The towers have been increased to a height never contemplated by their original builders; they stand on piers of the style of 1150, or earlier; the main strength of which is in their outer shell, the core being only rubble, not masonry. This outer shell has been cut into, to enlarge the chancel arch, as at St. Albans; to accommodate a staircase, as at Chichester, or at Weston, Herts; or some other like carelessness has been allowed,—settlement ensues, cracks open, and the blame is cast upon the bells. Towers can rock to an extent really wonderful and yet be perfectly safe, so great is the elasticity of their material, especially of flint. Still, a bell-frame ought not to be built into the fabric so as to be part of it; but to stand, complete in itself, upon corbels, or upon a set off in the walls,—because it must have room to move under the tremendous strain of bells in full swing.

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At the same time, it is undeniable that mischief has been done in many a belfry,—as by recklessly cutting in order to squeeze into the tower a frame larger than it can hold properly, or of a shape which cannot fit the base of the spire. Often, also, an attempt has been made to strengthen a rickety bell-frame by wedges driven between it and the outer walls, an act which has a direct tendency to rend the building ; for the walls were not constructed to bear a lateral thrust. But both these sources of mischief may be avoided ; because there is no reason at all against one or more bells being placed above the others, either in a separate frame on corbels of its own, or in an upper division of the main frame. Neither is there any difficulty in strengthening a bell-frame to any degree necessary ; it can be drawn together from within by long bolts with square-threaded screws.

THE WINDOWS OF A BELFRY are expected to perform two contradictory functions, viz. to exclude rain and snow, while they also allow the sound to go out and spread freely. It is necessary to shut out the drifting rain, but while we do this we are very apt to shut in far too much of the sound ; whereas the bells, and the clock especially, are intended to be heard all around. Also a badly constructed window may pour the sound of the bells in one great volume into the street below, which, in a town, is very objectionable.

I have seen, at Clyst St. George, an ingenious application of the ordinary hopper-ventilator. The

upper two-thirds of the window are closed by a shutter, the lower portion is occupied by the hopper, within which the shutter can be opened on its hinges. This plan shuts out the rain effectually and allows a large exit for the sound, but must concentrate the sound on the churchyard. A very excellent plan has been adopted at the cathedral of Worcester. The central portion of the roof of that tower, which is covered with lead, has been raised about two feet above the general level, and louvres are introduced all round ; the parapet conceals this arrangement from below, and also protects these louvres from driving storms. But the windows, properly so called, of that belfry are by no means weather-proof.

Each tower and each window must be considered by itself, because some are much more exposed to storms than are others. But on the whole no plan seems to answer better than the louvre. Wooden louvres should never be made of oak, because the drip from oak will stain the stonework, but of good pitch pine. They should be $1\frac{1}{2}$ inches thick, rent not sawn ; say 18 inches wide, well grooved into their frame ; fixed at an angle of 50 degrees, 6 inches on a squared line from the upper face of one to the lower face of the next ; the ends of the grain pointing out of window ; the bottom louvre covered with lead, and laid to shed the water safely. This work may be drawn full-size on a wall ; it is intended for a bleak window, and to last indefinitely. If a louvre admits wet,

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add an upright ledge to the inner edge. Louvres are made of slate and of stone, where those materials are abundant ; also of glass, which would seem to have very much to recommend it, both in appearance and utility, but would I fear be expensive, because of course the size must be the same, whatever the material.

In modern work it is common to find the belfry floor covered with zinc and pipes laid to carry off the rain-fall. I doubt the necessity of this if the louvres be properly made ; and I know that these outlet pipes will get choked and be worse than useless unless they be large and laid without curves, in which case they will probably be very expensive.

It is quite necessary to shut out the birds by means of wire-work. In some cases safe nesting-places may be provided for them outside.

THE RINGING CHAMBER.—Its position must depend on local circumstances. The mere difference between upstairs and downstairs will not prevent abuse. I prefer the former, because I had rather ring elsewhere than actually in Church. In any case it should be fitted up in a style suitable to the rest of the building. It should be well ventilated ; a large grating may often be inserted for this purpose in the middle of the floor. Its walls should be decorated with appropriate texts and mottoes, as well as with the records of peals rung. There should be seats, hat-pegs, and mats to save from needless wear all ropes which touch the floor at the hand-stroke,—this is really very important. A

slate, or blackboard, and a frame for notices, are often convenient ; also a cupboard for the mufflers, &c. and the steeple-keeper's brooms and appliances, as some one must be responsible for sweeping and cleaning. Cocoanut matting has one great drawback,—it does harbour the dirt. Door-mats, also, should be provided, and the whole chamber treated as, what it really is, part of the consecrated building.

The best *artificial light* for a ringing-room is gas. The pendant should be in the middle, full seven feet six inches from the floor, but hung from a ball-and-socket joint, so that it can move if a rope should catch it. The light is then well above the eyes of the ringers, and the shadows are all thrown back out of the way. A separate gas-meter is advisable. If gas cannot be had, then candles in a chandelier appear to be most cleanly and convenient. The use of paraffin, or any other of the mineral oils, should be forbidden,—they are so dangerously inflammable.

THE CIRCLE OF ROPES.—It is quite indispensable to change-ringing that the ropes hang down in a ring, *i. e.* around the circumference of a circle, and so that each man who is ringing may easily see all the others. This can be managed very readily, and without obscuring the west window, even when the ropes are brought down to the ground-floor in front of it, by means of iron stays fixed as may be convenient, which carry 'thimbles' to guide the ropes. These thimbles

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should be lined with wood or leather, and measure full $2\frac{1}{2}$ inches in the clear inside. The ropes, when not in use, are drawn on one side to hooks in the walls of the tower.

It is very important that the ringers should hear their bells distinctly, and not be stunned by them. The sound within the tower is regulated by packing the floor of the actual belfry with sawdust or well-kneaded clay, over which a light floor is laid, with trunks or pipes for the ropes to pass through. It is a bell-hanger's clear duty to direct his employer's attention to this point at the first. For it will obviously be a very easy job if done while the work is in hand, but most troublesome and costly if left until everything is finished. But close all cracks effectually, or the dust will work down, and leave no inflammable material exposed to an accidental light. A candle dropped on felt burned Haileybury dome; therefore I dare not recommend its use, although it deadens sound thoroughly and is very handy.

It is often convenient that the ladder from the ringing-room to the next storey be fixed with one leg in a socket, so that it can be turned up against the wall, out of the way of the ropes. And some thought should be bestowed on the trap doors, and on the shaft for the descent of the clock-weights. It is very unpleasant to hear some bells speaking down through these openings far louder than the others; and yet more so to find yourself, as has been my own case, standing directly under a heavy clock-weight.

NOTES AND MEMORANDA.—In a belfry no one thing is so costly as neglect, or so mischievous as dirt. Therefore let the whole tower be thoroughly cleaned, then carefully examined. If there be any clear and obvious mischief at work, or if neglect has reigned for years, it will be wise to call in a professional bell-hanger at once, and to let him report fully and in detail on the condition of affairs in general.

Under ordinary circumstances, one of the first things to be done is to provide facilities for moving about among the bells. If a man climbs out of a bell-pit by the help of its wheel, he strains that wheel, and with very considerable force, in a direction which was never intended, and is very likely to do mischief.

If a bell rings heavily, look to its gudgeons; and if it be a large bell, look carefully to the portion of the frame on which it rests. If, as the bell is rung, the gudgeons move in the stock, be it never so little, if, as is not uncommon, the frame itself yields under the tremendous strain, it is impossible for the bell to ring properly. One bell may be injured by the fault of a neighbour. In my own tower, four bells hang with their gudgeons in one line; the outer bell dragged over its portion of the frame, and, in so doing, jammed the ends of the gudgeons of, I believe, all the other three.

If the clapper has worn deep holes in a bell, that bell is plainly in danger of being cracked, and it must be turned half round. If the clapper has

come down (as may be the case), and is striking below the sound-bow (or thickest part) and near to the lip of the bell, the danger, though less obvious, is equally real. In both cases it will be wisest to call in a good church bell-hanger.

A clapper is hung commonly by an iron strap passed through the crown staple and bolted by both its ends to the clapper, a piece of leather being interposed between the strap and the crown staple. At other times it is hung by means of a 'box' of elm or ash wood, never of oak which corrodes iron. In each case the object is the same—to avoid the destructive friction of two metals working on each other. In each case the suspender will wear out in time, and the clapper, becoming practically longer, will strike too low. The wooden block will probably be the more durable; but good leather, well greased, lasts a very long time, and when worn, it can be replaced at once by the village shoemaker, which is a considerable advantage; and neither plan should be left unwatched from year to year.

The clapper-balls, if flattened, should be re-forged, and a wire passed through the bolts to prevent the possibility of their nuts working off.

BELL ROPES break first at the fillet, or point where they pass through the sole of the wheel; the reason being, in my opinion, that the hemp is bent too sharply at each hand-stroke. Therefore a reel of about $1\frac{1}{2}$ inches diameter should be inserted in the groove, secured by a rivet to light plates of iron

fixed on each side of the shrouding, so as to increase as much as possible the curve around which the rope is carried; the parts which the rope presses may also be padded with leather. The Rev. H. T. Ellacombe's wide-mouthed fillet appears to secure the same result in another way. The ropes should also be well greased with mutton fat, quite free from salt, down as far as the tuffing; and this is done most effectually in the driest weather.

The other point at which ropes break, is that at which they hit the floor; and for this reason each ringer should have a mat.

GREASE.—There are various receipts. 'Mix three table-spoons full of the the best salad oil with 1lb. of pure lard, melted.' Lard oil, being an animal substance, is better probably than olive oil. Lard, as sold, is often mixed with salt, &c., therefore buy the 'flare' from the butcher and melt it down at home. Some persons recommend to mix a little pure brimstone, or blacklead with the grease; others, the use of railway axle-grease. The gudgeons need extra attention in very hot, and in very cold, weather; also care is needed, lest grit from men's shoes find its way to the brasses. For wood sliding over wood, use black lead alone.

THE STAYS AND SLIDERS should allow the bells to be set securely, but not to go much past the perpendicular,—this increases the labour of ringing, and is also dangerous.

If a bell cannot be heard owing to its being

above the others, a wooden pipe may be brought down from it to the ringing room.

FALSE CLAPPERING.—Large bells generally 'rise false,' *i. e.* with the clapper on the wrong side. As this can be prevented only by a check, or jerk, which entails a heavy strain on rope and wheel, it is perhaps best to set the bell and then go up and turn the clapper over. Of course this cannot be done always, and never when bells are raised in peal.

LOCAL TRADESMEN.—Everyone should wish to employ the people of the place ; but no man of any trade should be allowed to do work in the belfry unless he has been specially trained and taught. Bells are pendulums swung through the entire circle. A builder, carpenter, or smith, does not know how to hang a pendulum. The work requires absolute accuracy in very heavy materials. It is done in a belfry, generally cramped, dark, and difficult of access. Unless a man have in stock the proper wood, thoroughly seasoned, and unless he understand the business very thoroughly, he will waste a great deal of time, and he will satisfy neither himself nor his employer, and the ringers least of all. They will be sure to notice if a bell clappers false, rings heavily, or strikes unlevel. I could point to towers which verify these words but too completely. Seasoned wood cannot be bought at will.

It is the same with bell-ropes ; they are manufactured specially ; an ordinary rope-maker cannot

supply them. I have been entreated to give an order for a set, although the specimens shown me have been such that positively I would not have accepted them as a gift, subject to the condition that I must ring with them myself.

NEW WORK.—The sole of a bell-wheel should be $1\frac{3}{4}$ inches wide, the shrouding the same in height, and bevelled on the inside so as to provide a broad and deep groove. In coarse weather, hemp will become stiff, and then the ropes are very apt to miss the wheel. I would never use an iron stay if I could avoid it, nor make a wooden stay too strong: better break a stay than a bell. A bell-frame should be as compact as possible, say 3 feet 6 inches from the under side of the cill to the top of the plate, and strengthened by every device of the joiner's art. A frame tall in itself, and complicated, will be sure to work loose, then the bells must ring badly. If there be reason to distrust the tower, hang the bells for chiming alone. In any case let the towers be kept clean and tidy. The decorations of last Christmas are not such sacred relics that they need be preserved there, in addition, perhaps, to those of the previous harvest; and the sexton should have a proper shed for his tools. I have seen strange sights in the tower even when the body of the church has been cared for reverently.

ON CHIMING.—There are two patterns of automatic machines which play tunes on church bells, manufactured respectively by Messrs. Gillett

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and Bland and Messrs. Lund and Blockley. They are, of necessity, very costly. There are also two kinds of simple chiming apparatus, the one invented by the Rev. H. T. Ellacombe; in it the hammers strike inside the bells. It is worked wholly by hand, and therefore the chimes can be varied at will. The other apparatus is that of Messrs. Warner; the hammers strike, like that of a clock, outside the bells. They are worked by turning a drum in the room below, and, therefore, the chimes produced are those to which that drum is set. I have no personal experience of this machine. One pair of hands can thus chime a whole ring of bells.

I must suggest two cautions as to Mr. Ellacombe's apparatus. The fulcrum of the hammer should stand upon a block, which should be fixed to the floor *with short nails only*. Then if by accident the bell is swung against the hammer, these nails will be drawn, and no other mischief done; whereas if the hammer be fixed with strong screws, something must break, and it may be the bell. Secondly, two pulleys to each of the hammer-lines are guide enough if properly fixed; a third, under ordinary circumstances, only makes needless friction. And the pulley-wheels should be of wood, brass bushed, and say six inches diameter. They will then work easily.

CLOCKING.—Each bell-rope is drawn up and hitched round the tail of its clapper; the lower ends of all the ropes are gathered into one man's

hands, and thus all the bells are chimed. With these results: the sexton is spared some trouble; everything touched is dragged askew, the ropes, which cost, say 12s. each, are drawn over the sharp edge of the pulley-wheel and of the pulley-box; the clapper is dragged to one side, and thus all four, rope, wheel, box, and crown staple are worn unfairly, the guides for the ropes in the ceiling of the ringing chamber are cut into grooves, and, worst of all, many a bell has been cracked. Thus: as the rope and the clapper are, both of them, heavy, the blows upon the bell are rather severe. Repeated blows cause the bell to swing, and also cause its whole mass to vibrate. Then, at some unlucky moment, *bell and clapper meet*, (the bell swinging down as the clapper strikes up), the result is a very heavy blow, and also the clapper held tight against the bell; thus the vibration is checked and the metal rends under the strain.

Clocking should be prohibited absolutely. Let any man go to a tower where it has been long practised, and examine for himself the condition of the ropes, their guides, the pulley-wheels, and pulley-boxes. I describe that which I have myself seen.

XXII.—**The Ringers and Ringing.**—I would refer to the papers read at the Church Congress in 1876. I am thankful to say that it is no longer necessary to deal with the prejudice against ringing, so great is the improvement of late years. Ringers are now

recognised Church officers; it will be their own fault if the old troubles revive; the advance yet needed can be accomplished by those means which have won so much already, viz., the power of personal influence actuated by high principle.

PAYMENT.—Chiming for Service is done according to orders given, therefore some person must be responsible for the work, and he must be paid for his labour. At the same time, volunteers should be enrolled to help; each undertaking a fixed Sunday in the month. And if there be a chiming apparatus this can be done, because then there is some interest in an occupation which otherwise is very dull.

Speaking generally, a Company of Ringers can scarcely be kept together without 'encouragement' in some form, which must be decided by local circumstances. The time-honoured institution of Christmas-boxes has many and very grave drawbacks. In a rural parish and with a small company I used to guarantee each man 5s. at the end of the ringing season, *i. e.*, May, in exchange for the Christmas-box. The scientific ringer finds his reward in his art and the pleasure which he derives from it.

I have no belief in fines; they cause discontent and do no good that I can discover. Any rules in addition to those given on page 95, must be statements of some general principle to which appeal can be made, not mere resolutions which can be altered at will. If difficulties arise from old

ringers, I can only say, 'Be patient and forbearing, persevere with scientific change-ringing, let alone those who will not join your company. Opportunity will come to a man who can wait.'

SUNDAY RINGING.—It is in the power of the Ringers to render this a good or a bad practice. If the bells 'call God's folk to prayer and praise,' if the company take their place among the worshippers, and, after Service speed the congregation homewards with a well-rung touch, then an office is discharged to the parish at large similar to that of the organ and choir within the sacred walls. But if men ring on a Sunday, because it is their idle day, because they begrudge a few hours of their own time in the week, if they make the belfry a place of amusement and of lounging for those who do not attend Church Service, such Sunday ringing is an unmixed evil and must be forbidden.

A Company of Ringers may attend a neighbouring Church rightly and usefully, as may a Choir, or a private family of worshippers. But if they habitually go out to ring they do wrong, because the practice involves a failure of principle. It amounts to treating the Lord's house and the Lord's day as our own wholly for our own amusement and without reference to His service.

I suggest the following rules. Ring early in the morning on the five great festivals, viz., Christmas, Easter, Ascension, Whit Sunday, Trinity. On other Sundays keep the ringing subordinate to the Service, let it not exceed the hour in length. Ring

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only that which you have practised previously, let all the Ringers attend the Service, exclude rigidly from the belfry every idler. But I have always found this practical difficulty : a man who has been ringing wants to wash his hands, &c. before he comes to Church.

PRIZE RINGING.—At these gatherings men meet at the Church gate and enter the consecrated building to contend for money in the use of those bells which call the living to prayer and toll for the dead. I think that this bare statement carries with it the strongest condemnation of the practice. I may add that it has been proved to be absolutely useless for its pretended object, the encouragement of change-ringing. Gross abuses are practically inevitable. The experience of all clubs of cricketers, oarsmen, or athletes, proves that where money is the object of competition the spirit of gambling will creep in, and that those who provide the funds will expect to be repaid in some way. As there are no tickets to be sold at a prize-ringing, and no gate-money to be taken, there is no income for anybody excepting that ubiquitous personage, 'the enthusiastic publican.' Ringers stoop low if they accept his patronage, and Clergy are guilty of a very grave error if they allow prize-ringing in the Churches entrusted to their care.

THE OCCASIONS PROPER FOR RINGING may be stated thus :—Those on which there is Service, or on which there might be Service without impropriety. But if the occasion be such that one could

not open the Church and employ the organ and Choir without irreverence ; then I think that one cannot, without impropriety, open the tower and employ the Ringers and the bells. This definition is wide. It admits almost every occasion of interest or rejoicing to the nation, to the town or parish, and even many which belong to private families. It excludes all that are merely political, and very many others on which bells have been rung. But frontier questions will arise which must be dealt with by those directly concerned.

The control of the belfry is vested by law in the Parson, subject to certain limitations. Abuses are not likely to arise where parson, church-wardens, or any churchman of position and influence take interest in the ringers ; but if there be habitual apathy and negligence in the authorities, it is no marvel if occasionally there should be even riot and excess in those below.

MUFFLED PEALS are rung after the funeral of any person specially connected with the parish ; also at midnight on the 31st December, on which occasion it would be well to provide a form of prayer for use in the belfry as the old year passes away. The bells are muffled on the back-stroke side of the clapper, and rung very slowly. A letter in *Church Bells* of November 18th, 1871, from C. A. W. Troyte, Esq., describes fully the manner of ringing changes in whole pulls on muffled bells, and the beautiful effect of their plaintive music. Some skill is needed to muffle bells just enough,

but without overdoing it; and an ordinary company will do well, at first at all events, to attempt no more than a single lead, *i.e.* the plain hunting-course, in whole pulls.

The mufflers are made of thick leather, and are buckled to the clapper, exactly as are a horse's knee-caps to the animal's legs.

ANNUAL INSPECTION.—In conclusion, let it be remembered that nothing can go on properly without regular attention. Therefore let the whole belfry and all its contents, especially those working parts which are out of sight, be examined thoroughly once a-year,—say on the 1st October, before the ringing season begins. Repair immediately any accident, however slight. An inheritance so valuable as a Church Tower with a ring of Bells deserves care; and to no place does the proverb, 'Penny wise and pound foolish,' apply more forcibly.