

## The Bells of St. Martin's, London

*On 12th May I attended a lecture at the Royal Institution in London entitled "The Bells of St. Martin's". It was given by David Hardwick, Ph.D., D.I.C., who is Senior Tutor of the Department of Civil Engineering at Imperial College. He is also a churchwarden of St. Martin-in-the-Fields.*

The Royal Institution in London is a very august body, and it was necessary to dig my dinner-jacket out of its mothballs merely to attend the lecture, which started at precisely 9 p.m. and lasted for precisely one hour, which is an ancient tradition. I expected to see the place packed with ringers, but in fact I only met two that I knew: Bill Cook and Derek Sibson. The latter had done much of the manual labour of installing the new ring, as well as donating the treble in memory of his son.

The lecture started with a description of the old ring at St. Martin's. They had been there for two-and-a-half centuries, cast by Rudhall. They were originally designed as a ten, but an extra two had been squashed in to form a ring of 12. There had been many problems over the years, and some of the bells had been recast. The speaker pointed out that the church had obviously always been short of money, because it was mentioned in "Oranges and Lemons": "You owe me five farthings said the bells of St. Martin's!". Ten years ago an appeal was started to improve the fabric, and the ringers began to agitate to have the bells rehung, because they were extremely difficult to ring.



*The victorious SUGCR team: (l to r) Roy Mould, Nicholas Kimber, Simon Dixon, Judith Godfrey, Rupert Howes, Rhoda Mottram.*

### Thirteenth time unlucky

The annual Winchester District 6-bell striking competition took place on the rainy morning of Saturday, 29th April, at Holy Trinity, Wonston. The ringers were able to shelter in the church and were treated to a local art exhibition while awaiting their turn. The house adjacent to the church was made available to the judges - David and Pam Manger from Kent - and they were most grateful for the luxury this provided, particularly the coffee and biscuits!

Eight teams entered in all: two each from Bishopstoke and Southampton University and one each from Winchester Cathedral, Hursley, New Alresford and Broughton. General ringing after the competition was followed by a service at the neighbouring church of Stoke Charity. A ploughman's lunch was provided by the ladies of Wonston at Micheldever Church Hall, after which followed the quarterly meeting and the results.

David Manger complimented all the bands on the high standard of ringing, and he hinted that

There followed an explanation of how a bell is rung, with colour slides taken at very short time intervals, almost like a slow cine, showing first a bell swinging round through handstroke and backstroke, followed by a similar sequence showing the ringer handling the rope. There was a short description of change-ringing, with a recording of rounds, call-changes and methods on 12 bells. I quote: "Peals consist of over 5,000 changes, and are rung when the Vicar can be persuaded to spend a day in the country!".

St. Martin's bells, it seems, had always been difficult to ring, and it was decided that the cause was the movement of the tower as the bells were rung. A seismograph was borrowed from the Whitechapel Bell Foundry, and the tower was found to sway about 2 mm. (which is less than occurs in a high wind). The effect on the bells, however, was considerable. Some graphs of the horizontal forces transmitted to the tower by a swinging bell were shown. The tower has its own natural frequency of vibration, however, and it is the effect of this on the swing of the bells which makes them difficult to ring. The movement tends to add or subtract to the motion of the bell to such an extent that the ringer had to over-pull by about 11% in order to be sure that the bell was fully under control. The lecturer produced a splendid model of a rigid tower, with a bell swinging at the top, and demonstrated that it rang absolutely regularly when left to swing on its own. He then removed some of the strengthening tie-bars, to make the tower flexible, and repeated the experiment. The bell now swung irregularly as the movement of the tower affected the swing. It was a most convincing demonstration, which earned a round of applause from the audience.

Many churches get over this problem by lowering the bells in the tower. Apparently if you halve the height of the bells, the movement of the tower is reduced by a factor of two cubed; i.e. by a factor of eight. In order to calculate the effect of this, David Hardwick made use of an extremely simple but effective accelerometer to measure the acceleration of the fabric at different levels in the tower. It consisted of a long horizontal tube full of water, with a smaller diameter tube sticking up vertically at each end. It worked because of the inertia of the water in the main tube. When the latter was moved endwise, the water tended to remain stationary, so

the top teams were very close indeed. The final results still came as a surprise though: the Winchester Cathedral band, having won the trophy for the past 12 years, were beaten by half a fault by the Southampton University "A" band with their toe-tapping Bob Minor. Bishopstoke "A" were third, followed by Hursley, New Alresford, Bishopstoke "B", Southampton University "B" and Broughton.

The afternoon ringing continued at Micheldever, while the gallant losers, reluctant to lose sight of "their" trophy, made sure it was going to a good home. One thing's for certain - the competition will be even tougher next year. N.K.

### Method named

The following method was rung to two extents on Saturday 29 April 1989 at Nutfield, Surrey and the band wish to name it RELIANT MINOR.  
Plain Minor Collection No. 568.

Reliant Minor: x16.56.16x56 1e12.

Thames Ditton. \* \* \* JONATHAN LANE.

Laundresses steam along the Reckitts Blue line. (for oldies)!

the level went up in the tube at one end and down at the other, and the acceleration was proportional to the movement of the water. It was found that the maximum movement was just above the bells. Because of various factors, such as the position of the clock and of the organ, it was impracticable to lower the bells more than 4.5 metres. It was calculated (using the cube relationship) that this would reduce tower movement by half.

The ringers wanted the bells rehung, but it was pointed out that this was the oldest ring from a single foundry in the country, so the conservationists began to agitate. At this point Australia came to the rescue, by requesting the bells for a new ring at Perth, and at the same time offering to donate enough copper and tin from Australian mines to cast a complete new ring of 12 for St. Martin's, as well as a sharp second, to enable a top light octave to be rung.

To pay for the new installation £130,000 was required. Some of the money had been raised already but it needed a further £95,000, so an appeal was started. The Cumberland Youths did many sponsored activities to raise the money, as well as a seemingly endless round of coffee mornings, sales, etc. The ringers also saved £10,000 by amateur help, lowering the bells, preparing the tower, raising the new bells, etc. Again I quote: "You couldn't have a more professional group of amateurs". A grillage was prepared in the tower at the level where the new bell frame was to be installed, and 15 tons of concrete were pumped in from a giant mechanical praying mantis.

We were the shown some diagrams and pictures of the Whitechapel Bell Foundry, and the process of casting a bell was explained. Bell metal consists of 77% copper to 23% tin, and some photomicrographs were projected of pure copper, pure tin, and bell metal. The grain boundaries in the latter were small and irregular, which stops dislocations from propagating through the metal. This is why bell metal is so much harder and tougher than either of its constituent metals. There was then a short discourse on tuning bells, stating the harmonics which are used, with photos of a bell being tuned. There were then some photos of the bell frame being assembled for testing before being bolted to the grillage in the tower, followed by pictures of the bells standing on the floor of the church to be blessed, before raising them into their positions in the new frame.

When the great day came for ringing the bells for the first time, measurements were taken of the tower movement, and it was found that the sums had been wrong, because the movement, far from being reduced to a half, was now imperceptible! This could be due to the inertia of the extra mass of 15 tons of concrete in the new grillage. The result, however, was extremely pleasing after all the hard work which had gone into the project, and the bells and ringers are now in close harmony. The bells no longer say "You owe me five farthings".

Dr. Hardwick ended with less than a minute to go before his statutory hour was up, and received prolonged applause for an excellent and most interesting lecture. There was also a very comprehensive exhibition about bells and bellringing in one of the rooms at the Royal Institution. Most of the audience went round this, and since they were nearly all non-ringers, it is possible that some of them may be interested in learning to ring as a result. The writer did his best to "spread the gospel" to those around him, several of whom seemed quite interested in the idea. I hope the seeds will bear fruit.

ALAN GRIFFIN