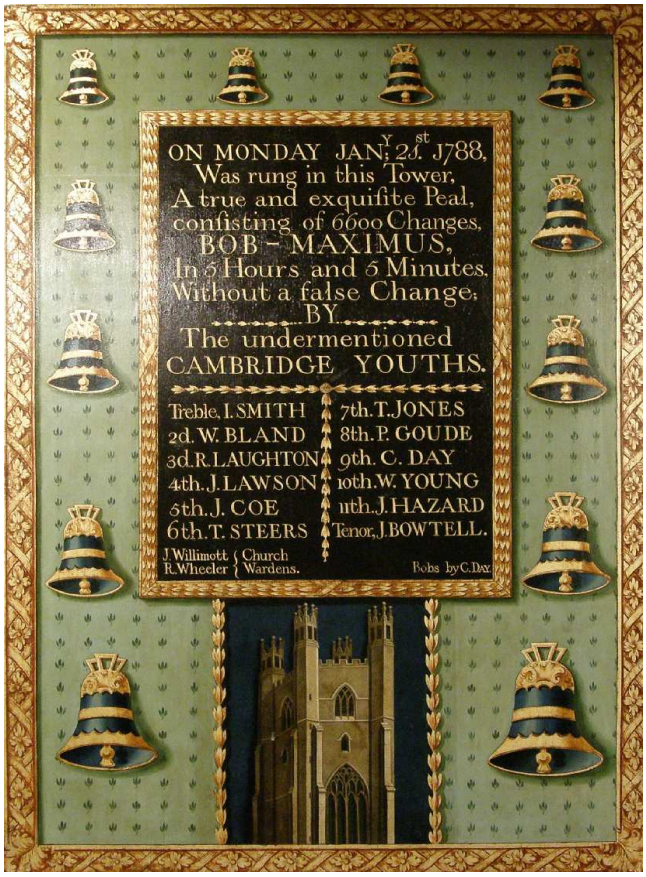
The University Church of Saint Mary the Great

The 1788 Peal Board



The Restored Peal Board

Some Notes on its Construction and Conservation

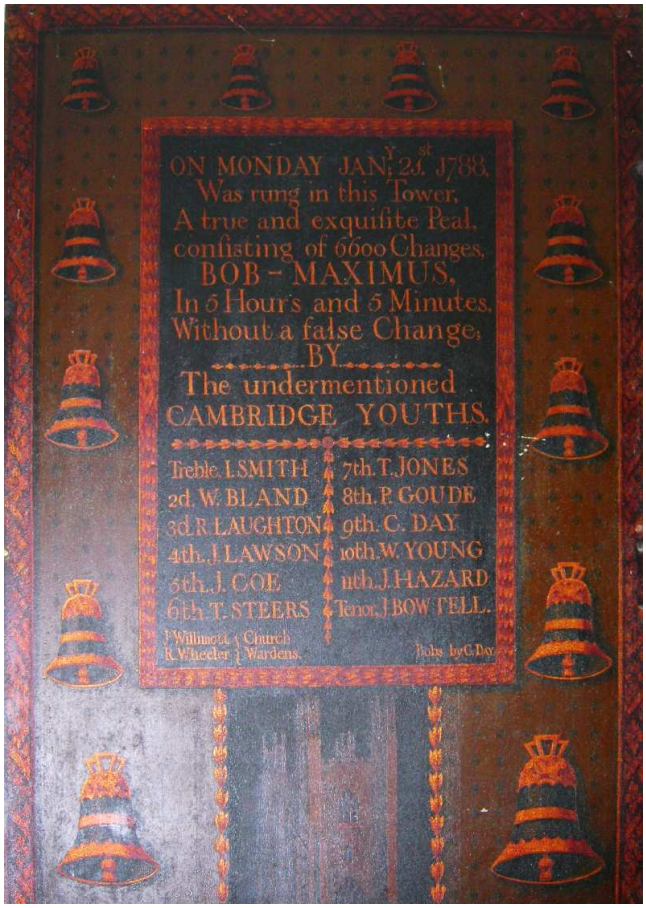
by

Frank H. King

Cambridge **February 2011**

The Peal Board Shortly before Restoration

The photograph below was taken in the ringing room of Great S. Mary's on 2 April 2009, shortly before the room was refurbished as part of the project to install a new ring of 13 bells. The board is very dark and there is no hint that much of the background is a light blue-green colour. It is hard to see many of the details, especially those in the painting of the church tower at the bottom.



Photograph by Phillip Orme

Cover Photograph

The photograph on the cover was taken on 8 November 2010 when the conservation and restoration of the peal board were at an advanced stage.

Preface

The 1788 mahogany peal board in the ringing room of Great S. Mary's is large and richly ornamented. Its presence dominates the room.

A black and white photograph printed in Volume I of the Royal Commission on Historic Monuments (RCHM) in the City of Cambridge, published in 1959, is reproduced in Fig. 1. The board appears to be in good condition and the writing is readable.

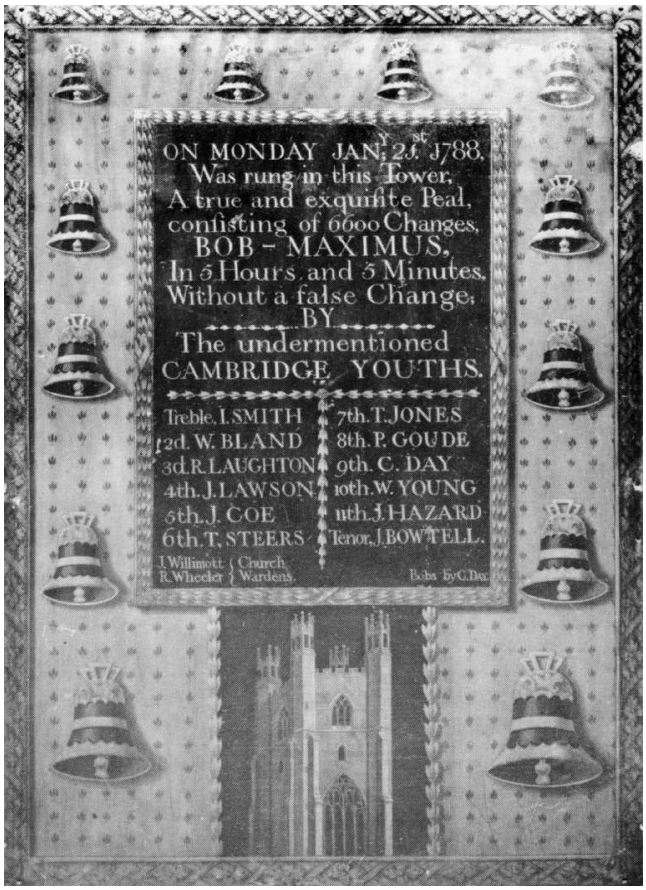


Fig. 1 — Copyright RCHM 1959

In the 1960s this peal board was sufficiently well known that it featured in a book simply entitled *Cambridge* by Michael Grant. Again, the board appears to be in good condition.

Unfortunately, by the 1970s, the surface had become very opaque and, at a cursory glance, the peal board was a rather uniform dark brown.

Following the installation of the new ring of 13 bells in 2009, it was decided that a number of improvements should be made to the rooms in the tower and to the Ringing Room in particular. The restoration of the panelling was a high priority and a new carpet was laid shortly afterwards too.

The work on cleaning, conserving and restoring the historic peal boards, started with the 1788 board, the biggest and the best.

The work was undertaken by a local conservator, Julie Crick. Before she started, her colleague, Bo Killander, devised a new way of hanging the board. No screws or other fixings go through the board itself and no part of the hanging arrangement is visible from the front.

This document gives a description of the peal board and offers a record of the cleaning and restoration.

The text has been checked by Julie Crick who made numerous helpful comments, all of which have been acted on.

1 — The Peal

A peal is a performance on bells which involves ringing 5000 or more changes and typically takes about three hours to ring. A particularly significant peal may be commemorated by a peal board which is displayed in the ringing room where the peal was rung.

Given its size, the 1788 peal board provides remarkably little information beyond the bare facts about the peal that it records. The details given include the date, the number of changes, the method, the time taken and the names of the ringers. The ringers are described as Cambridge Youths. This is a reference to The Society of Cambridge Youths which was founded in 1724 and whose members are the local bellringers at Great S. Mary's.

The board notes that it was 'A true and exquisite Peal' and that it was rung 'Without a false Change', but one rather hopes that all peals are true and therefore without a false change.

The attribute 'exquisite' may or may not have been merited but the peal was certainly noteworthy in other respects. This was the tenth peal to be rung at Great S. Mary's and the first peal of Maximus, a peal in which all 12 bells take part in the changes. The ring of bells had been augmented from 10 bells to 12 bells in 1770 so it had taken eight years to achieve a peal of Maximus.

The ringers could have rung a peal by ringing just over 5000 changes but they chose to ring many more than the permitted minimum. The longest peal to be rung at Great S. Mary's, prior to 1788, was of 5610 changes and had been rung in 1770. It is possible that the ringers wanted to exceed this number of changes by an appreciable margin.

Longer peals of Maximus had been rung elsewhere by 1788 but this was the longest peal of Plain Bob Maximus ever rung. It remained the longest such peal until Christmas Eve, 1966, when a peal of 10,080 changes was rung on handbells.

A report of the 1788 peal was published in the local newspaper, *The Cambridge Chronicle and University Journal*, on Saturday, January 26, 1788, which was just five days after the performance. A transcript of this report is given in the Appendix at the end of this document and it is fulsome in its praise of the quality of the ringing.

A current member of the Society of Cambridge Youths, Richard Smith, who supplied much of the information above, has drawn attention to a puzzle concerning later reports of this peal. In particular, a report which is almost word-for-word identical to that in *The Cambridge Chronicle* was published in the August 1796 issue of *The Sporting Magazine*. The only significant difference is that the date of the peal is given as July 30, 1796.

The Sporting Magazine report seems to have been widely copied with the result that the 1796 performance is listed in some records as the 14th peal at Great S. Mary's. There has to be considerable doubt about the 1796 peal. It seems likely that all accounts of it stem from a misreporting of the 1788 peal.

It is possible that *The Sporting Magazine* simply got the date wrong but the reported date is less than a month before the publication date, August 1796. Why was the magazine purporting to report recent news when the event actually took place well over eight years previously?

This puzzle is still unresolved.

2 — The Carpenter's Work

The peal board is made from five panels of mahogany and, overall, is 1508 mm high, 1023 mm wide and 20 mm thick. A large panel at the top, whose grain runs horizontally, lies across two other large panels, whose grain runs vertically. At the sides, there are two narrow panels which form the vertical edges of the board as a whole.

Additionally there are two chamfered pine battens at the back which are screwed to the large panels. These give support to the assembly and are also used for hanging the board. There is no frame round the board.

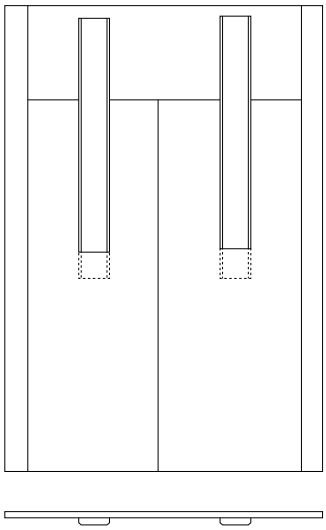


Fig. 2 — Rear Elevation and Plan of the Peal Board

Fig. 2 is a schematic view of the rear of the peal board and shows the five panels and the two battens. A plan view of the board and the battens is at the bottom of the figure.

The figure is to scale and shows a number of asymmetries. The narrow panels are not quite the same width and the two large vertical panels are not the same width either.

Wood is an anisotropic material and the dimensions along the grain and across the grain are affected differently by changes in temperature and humidity. Accordingly, it is regarded as bad practice to have a large panel with its grain running at right-angles to the grain of other panels abutted to it. Fortunately, mahogany is a very stable timber and there is no sign that the top panel has parted from the lower panels.

In the 18th century, carpenters had reasonably good planes and cabinet scrapers but, by modern standards, their glues were poor. The battens help to hold the top panel against the other large panels but do not help to hold the narrow panels to the large panels.

It is possible that the carpenter used dowels and the conjectured positions of three dowels are shown by broken lines on the left-hand side of Fig. 3.

Another technique was to use loose tongues. The familiar tongue-and-groove flooring has tongues which fit into grooves. If two grooved edges face each other a tongue that is common to both can be inserted. This is called a loose tongue.

A skilled carpenter would not carry the tongue to the ends of the boards thereby ensuring that the tongue would would be fully hidden. Such tongues were known as stopped tongues and a conjectured stopped tongue is shown on the right-hand side of Fig. 3.

Central heating can cause timber to shrink and dowels and stopped tongues can be exposed. Fortunately for the peal board, there is no central heating in the ringing room and no sign of any dowels or stopped tongues can be seen.

Notwithstanding the poor quality of the glues and the absence of a frame, there is little sign that the panels are separating. Moreover the five panels form a remarkably flat whole, both front and back.

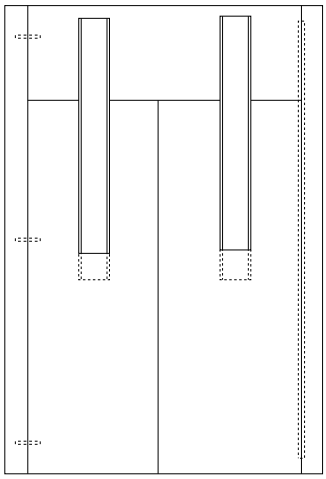


Fig. 3 — Conjectured Dowels or Loose Tongue

Rub marks on the rear of the board suggest that the battens were originally a little longer than they are now. The broken lines in the figure show the conjectured original lengths.

In 1952 a new ceiling was constructed which reduced the headroom above the board. The lower ends of the battens rested on the parapet of the panelling and these ends had to be trimmed so the board could be lowered a little.

This trimming was not well executed and more was cut off one batten than the other. In consequence, the weight of the board on one side was taken by a screw that was driven through the board near one of its vertical edges. This eventually led the board to split.

3 — The Artist's Work

As delivered by the carpenter to the artist, the peal board would have been bare and untreated wood.

By preliminary inspection, by observation during the cleaning process, and by knowing how artists worked in the 18th century, it is possible to form a fair idea of how the original artist set about his work.

It is not known where this work was undertaken. The artist may have worked in a studio or on site. In 2009, the board was found to be too big to take down the spiral staircase that leads from the ringing room but that was probably because the handrail which was fitted in the 1950s has reduced the room for manoeuvre. Without the handrail the board might just fit.

Although one cannot be sure where the board was painted, there is faded writing on the back of the board which gives a name and date: Chas Freeman Jan 13th 1789. See Fig. 4. The name is very likely that of the artist and the date is possibly the finishing date, about one year after the date of the peal.

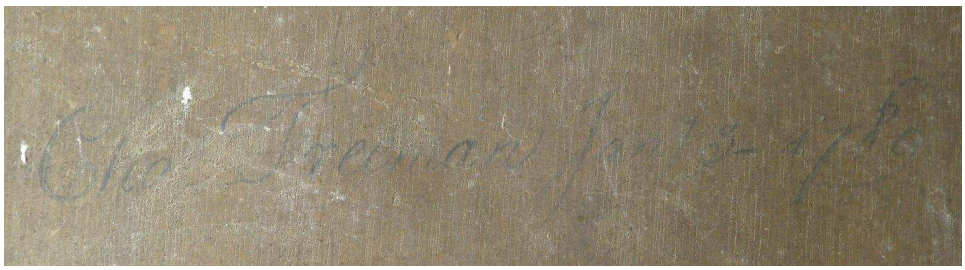


Fig. 4 — Chas Freeman's Signature

The artist's first task would be to apply some form of primer. In those times, artists used a thin oil paint layer which would be tinted and it was common to use scraps of unused paint. After priming, the surface may have been off-white, grey or brown.

The back of the board is a dull grey colour and this is could be the original primer with a layer of varnish on top. It makes sense to treat both the front and the back for the purposes of balance. Any tendency for the paint to cause the panel to warp is reduced by treating both sides.

The next task would have been to mark out the principal areas on the board. These are shown in Fig. 5. A common technique (still in use today) was to use chalk lines which were stretched over the surface and pinged onto it.

The colours of the three major regions would then have been applied in oil: the black background in the central region, the light-blue background round most of the outside and a dark-blue background for the painting of the church tower in the lower central region.

The painted details would also have been applied using oil paints.

A considerable quantity of gold leaf was used in executing this peal board. In particular, the outside border and the internal borders have gold leaf bases.

In the late 18th century some kind of tinted mordant or size was normally applied as a means of fixing the gold leaf. In this board, there is no evidence that such a tinted mordant was used and the artist probably drew the lettering in clear gold size. The gold leaf would then have been applied to the size and the surplus gold rubbed off.

Although the board has no frame of any kind, the artist has painted shadows on two of the inside edges of the outside border to give a *trompe l'oeil* effect. The imagined light source is above the board and to the left and the border appears as a frame that stands out from the board itself.

The inner frame and the two sides of the lower central region are likewise given shadows and these are hinted at schematically in Fig. 5.

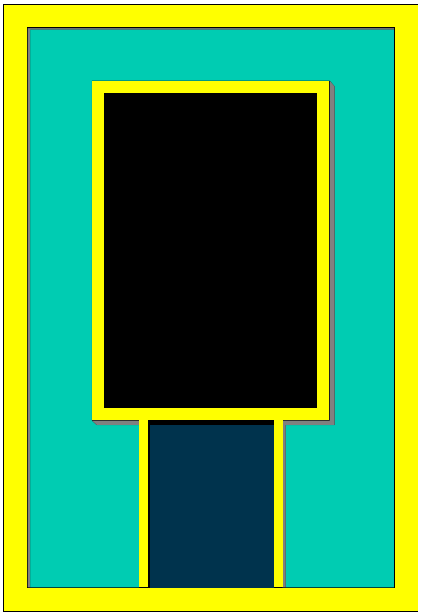


Fig. 5 — Front Elevation and Outline Design

Much of the gold leaf is itself over-painted to give a further three-dimensional texture to the framing. The over-painting was achieved by applying a pigmented resinous oil layer on top of the gold leaf. This is referred to as tinted glazing.

Most of the features on the peal board are clear from the cover photograph. The light-blue background is ornamented with small trefoils, almost giving a wall-paper effect.

Twelve bells of twelve different sizes are painted on this background. From left to right and top to bottom they are in increasing order of size and presumably represent the twelve bells in the tower from treble to tenor.

The crowns and cannons of the bells are ornamented in gold leaf and there is further gold leaf round the waists and lips of the bells. Gold leaf is also used for the balls and flights of the clappers. Continuing the shadow effect, the artist has shown the clappers casting shadows on to the soundbows and the bells casting shadows onto the background.

The lettering on the peal board is confined to the central region where details of the peal are are given. All the lettering is in gold leaf and, unsurprisingly, the layout, abbreviations and punctuation appear a little dated.

The list of names showing which bellringer rang which bell is reproduced in Fig. 6. The abbreviations 2d. and 3d. are not used today but from 4th. onwards the abbreviations are familiar. The unabbreviated words 'Treble' and 'Tenor' are followed by commas.

Fig. 6 — The Names of the Bellringers

Most of the lettering in Fig. 6 could be that of a present-day sign-writer though the digits '7' and '9' have descenders and the digit '6' appears to be a little over-size.

These days one would write 'Conducted by' rather than 'Bobs by' to indicate the name of the conductor, the person responsible for the ringing. It is no longer customary to note the names of the church wardens.

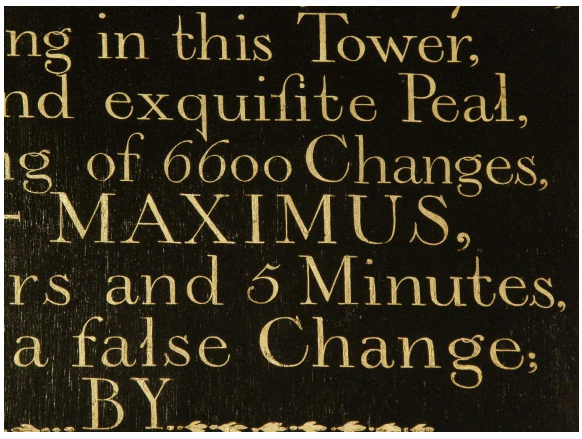


Fig. 7 — Old-Style Lettering

Elsewhere there are lettering features which are not generally seen today. The detail in Fig. 7 includes two instances of a lower-case 'l' ornamented by an extra downward stroke to the left. These letters are used in the words 'Peal' and 'falſe'.

There are other 18th century peal boards in Great S. Mary's with this style of lower-case 'l' and it is possible that it is a variant of the looped version of the letter, ℓ, but with the loop closed up. There is no obvious connection with numerous variants of the letter such as the Polish, ł, or the pound-sign, £.

Interestingly, the 'l' used in the names of the church wardens is the familiar version.

In Fig. 7, the letter 's' in 'exquisite' resembles a modern 'f', a common way of writing 's' at the time. This form is used for the first 's' in 'consisting' (see Fig. 14) but not for the second.

The lower central region of the peal board is occupied by an interesting painting of the tower of Great S. Mary's. This is discussed at some length later.

When the painting and gilding were complete, the artist added a final layer of varnish. This would have been clear varnish and it would have had a slight oil content.

4 — The Ravages of Time

During the cleaning process it became clear that two further layers of varnish had been applied in the 19th century. These layers had such a distinctive signature that it is almost certain that they were applied by the same person. They were thick layers of lightly tinted varnish.

It was quite common in Victorian times to treat paintings in this way. The peal board may have been deemed too flamboyant and, by slightly darkening its surface, the board would be considered to have a more venerable appearance.

Contrary to what had been expected, there was no obvious evidence of 20th century varnish. It seems that the two layers of 19th century varnish were largely responsible for the pronounced darkening noticeable in the photograph on the inside of the front cover but that this darkening held off until the later half of the 20th century.

The details in the painting are still clear in the RCHM photograph published in 1959 and reproduced in Fig. 1 and there has been some speculation that the severe darkening of the varnish was brought on by the installation of fluorescent lights in the ringing room in the 1950s.

These lights give off more ultra-violet light than incandescent bulbs and ultra-violet light is known to darken varnish. Such lights are now frowned upon by art galleries and museums.

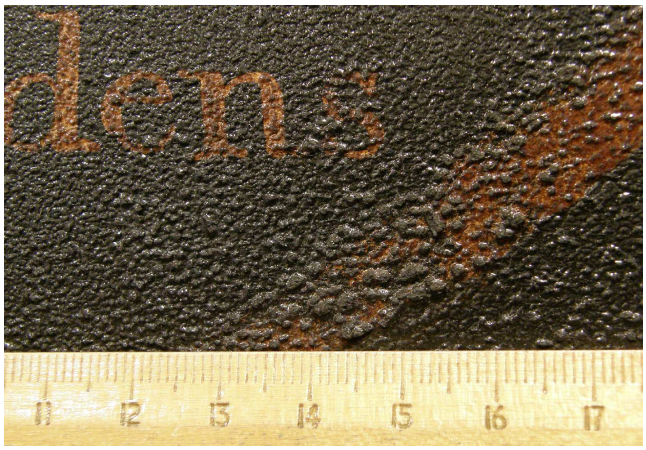


Fig. 8 — Example of Serious Alligatoring

Varnish is less elastic than oil paint and while small changes in dimension caused by variations in temperature and humidity can be accommodated by paint, varnish tends to crack and to coalesce into blobs. The appearance can be a little like that of an alligator's skin and the effect is sometimes known as alligatoring.

An extreme example of alligatoring is shown in Fig. 8 where a ruler which is divided into centimetres and millimetres shows the size of the blobs. Interestingly, the alligatoring is more pronounced where the varnish is over gold leaf than where it is over paint.

This photograph shows a detail of another 18th century peal board in Great S. Mary's before cleaning. The 1788 peal board had already been cleaned at this time.

Apart from the overall dark appearance, the peal board suffered a number of more physical injuries. Much of the damage was the result of poor hanging.

Iron retaining brackets had been used to hold the upper part of the board to the wall and these had rubbed against the gold leaf.

More serious damage was caused by drilling holes through the mahogany so that screws could be used to secure the board to the wall. Most of these holes were near the edge of the board and there were some serious splits.

When the ceiling was lowered in 1952, the board had to be lowered too and a new set of holes was drilled into the mahogany. As a result of incompetent measuring, a single screw supported half the weight of the board. Unsurprisingly, this screw caused the most serious split.

In the bottom left-hand corner of the board a small piece of the mahogany had split off and was missing. This damage is shown in the photograph in Fig. 9 and two large holes are also clear. The upper one is associated with a split in the wood.

Fig. 9 — Damage to the Bottom Left-Hand Corner

Some other minor blemishes in the gold leaf are noticeable too.

The *trompe l'oeil* shadow of the left-hand edge of the frame, cast by an the imagined light source, can be seen and, parallel to this shadow, is a vertical line. This is the join between the narrow panel on the left-hand side of the board and one of the main mahogany panels. This join doesn't count as damage.

5 — Cleaning

An early goal was to clean off the varnish and to expose the original paintwork beneath. There are many solvents that will remove varnish but one has to apply the solvent in such a way that it does not harm the paint layer below. Unfortunately, alligatoring complicates the process.

The top diagram in Fig. 10 shows an exaggerated cross-section of a fragment of the board. The light-brown block is the mahogany base and the thin light-blue band is the paint layer. The three dark-brown lumps are cross-sections of blobs of varnish.

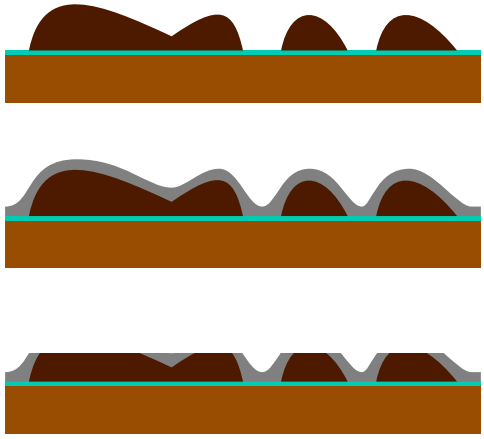


Fig. 10 — Blobs of Dark Varnish

Any solvent applied to the blobs in the top figure would have run into the spaces between the blobs and there would have been a danger of damaging the paint. By way of a slight paradox, Julie Crick's first step was to add another layer of varnish! This is the grey top layer in the middle diagram of Fig. 10.

She used Paraloid B72 which is a robust synthetic varnish which ran into the gaps between the blobs and over the tops of the blobs too.

The next step was to give the entire surface a light sanding. This step is a little like knocking the tops off spots. The varnish protected the valleys but not the peaks.

The sanding procedure is an unusual approach but it can be used safely when a painting is very flat and, by good fortune, the mahogany has remained almost perfectly flat over the centuries.

After this, a 3% solution of Ammonia in water was used, an inorganic solvent. The Paraloid B72 (now confined to the valleys) is resistant to this solvent but the exposed blobs were not. The Ammonia had the effect of swelling the old varnish and reducing the blobs to leave a more even thickness of varnish overall. It was then safe to remove the remaining varnish with a mixture of 30% Isopropyl Alcohol in White Spirit.

This is a painstaking process. The solvents are applied using cotton-wool swabs on sticks and care has to be taken over timing. If the solvent is applied for too long, there is a

danger of leeching out components from the oil medium of the paint. If the solvent is not applied for long enough the unwanted varnish is not removed.

Fig. 11 shows Julie Crick at work in the Ringing Room at Great S. Mary's. She is applying a solvent to the top part of the peal board using a swab. Bottles of solvent are seen in the foreground and a bright lamp is on the floor in the rear background.

Fig. 11 — Julie Crick at work

As an experiment, another conservator's solvent, Cellosolve, which is a Glycol Ether, was tried over a small test patch but found to be too aggressive.

Almost all the solvents that were used are volatile, inflammable and toxic, so care has to be taken when working with them.

At the end of the cleaning stage, the original art work was fully exposed in all its glory.

6 — Restoration

These days, it is standard practice to cover the original work with what is known as an isolation layer. Any touching-up or repairs goes on top.

The idea is that any future restoration can begin by removing the isolation layer with gentle solvents and, with it, anything on top that is not original.

The isolation layer applied was another coat of Paraloid B72 varnish. This is a clear varnish and has been in use for many years now. It is not expected to darken for a very long time.

With the isolation layer in place, attention next turned to the physical damage to the board. The holes, missing fragments and rubbed away gold leaf, are known as losses and these were attended to one by one.

The larger splits in the wood were repaired simply by using a water-based glue. The missing fragment from the bottom left-hand corner of the board was made good by carefully shaping a new piece of mahogany and gluing it to the board.

Most of the losses, such as holes for screws, splintered wood, and injuries from iron brackets were made good by filling with beeswax.

When new gold leaf was required it was, in many cases, applied directly to the beeswax. In other places a quick-setting gold size was used.

The touching up of the painted areas was achieved by using Larapol A81 as a binder to which appropriate pigments were added. This was applied to the coloured areas and was also used as tinted glazing on the gold leaf.

The materials used by the conservator for varnishing and in-painting (touching-up) do not cross link over time and remain readily soluble in solvents that are safe to use on the painting.

When the whole board was fully restored, a final layer of Regalrez 1094 Hydrocarbon Resin was applied. This was mixed with a tiny amount of Cosmolloid Wax. By adjusting the mix, one can tune the glossiness of the finished result anywhere from matt to full gloss.

7 — Original Mistakes

There are a number of small mistakes and blemishes in the restored peal board which have been left alone.

Conservators are happy to make good losses and this includes repairing splits and knocks which have been incurred over the years. By contrast, if a conservator spots an imperfection which was present from the beginning and which the original artist either did not notice or chose to ignore then no attempt will be made to disguise the imperfection.

There are a number of such imperfections in the restored peal board and it is of interest to draw attention to some of them. A typical example is illustrated in Fig. 12 which shows a small detail of the board near the top right-hand corner. A little patch of gold can be seen which is clearly out of place.

Fig. 12 — Misplaced Gold

Fig. 13 shows a small blemish close to the middle of the board. There is a curious smear which runs from just below the letter E almost as far as the letter Y.

Fig. 13 — A Painted-Over Run of Glue

This smear is below the surface of the paint and it is possible that when the panels were glued together a small run of glue spread over the board and was not scraped off. This glue remained on the board and was covered in primer and then paint.

The artist probably didn't have very good lighting to work by and, noting the January date in Fig. 4, the work was very likely undertaken in winter. It would have been easy to overlook a smear of glue. Certainly it is quite difficult to see this blemish even in good light today.

In Fig. 14 there are two imperfections. There is a smear across the 'st' in 'consisting' and the gold leaf in the letter O of BOB is broken up.

The smear in this case is a scratch. It is possible that the artist knocked something against the paint when it was still wet. The gold leaf for the lettering has been applied over this scratch.

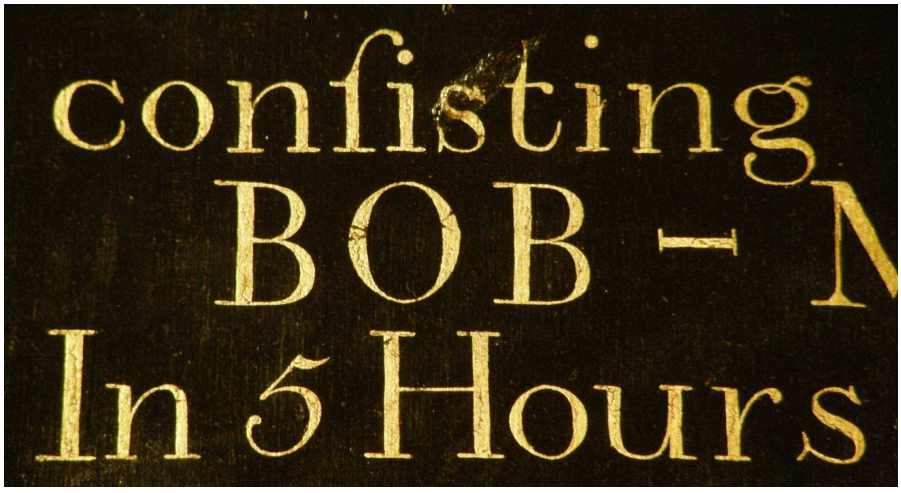


Fig. 14 — A Scratch and Poorly-Applied Gold Leaf

In the letter O of BOB the gold leaf has not been applied very well. Gold leaf is very difficult to work with partly because it is so light. Ideally, it should be applied in a totally draft-free room because the slightest movement of air can fold a piece of gold leaf over on itself and make a mess.

This can also happen if the gold leaf is transferred too quickly. Simply moving it through the air makes it fold up and crease. There is evidence of such folding on both the left and right-hand sides of the letter O.

The mistake illustrated in Fig. 15 is of particular interest because this one was corrected by the artist. The figure shows detail of the bottom right-hand corner of the peal board where the largest of the 12 bells is depicted.

On close examination, one can see what almost looks like a curved crack in the bell running down the left-hand side. The crack is parallel to the left-hand margin of the bell and appears to form the original margin. The implication is that the bell was originally drawn about four-fifths of its final size.

This bell represents the largest bell in the tower, the tenor, which is always significantly larger than the second largest bell. It is possible that a bellringer, looking at the first attempt, pointed out that the bell was too small and asked the artist to make it bigger.

The ringer of the tenor was John Bowtell who is known to have had a strong personality. He would have been very pleased to have rung such a heavy bell in such a long peal and might, perhaps, not have been too happy to see his bell incorrectly emphasised. It would, of course, be carrying speculation too far to suggest that it was John Bowtell who pointed out the error!

Fig. 15 — Alteration to the Largest Bell

Fig. 15 also nicely shows the painted shadow of the bell as a whole and the shadow of the clapper cast onto the soundbow.

8 — Rehanging the Peal Board

It has been noted that much of the damage to the peal board was the result of poor hanging. For most of its life the board was held in place by iron brackets and screws. Holes were drilled through the mahogany board and since the artwork extends to the very edge of the board these holes went through the gold leaf too.

A new hanging arrangement was designed by Bo Killander and this is illustrated in the drawings in Fig. 16 and in the photographs in Figs 17 and 18. No fixtures are attached directly to the mahogany board.

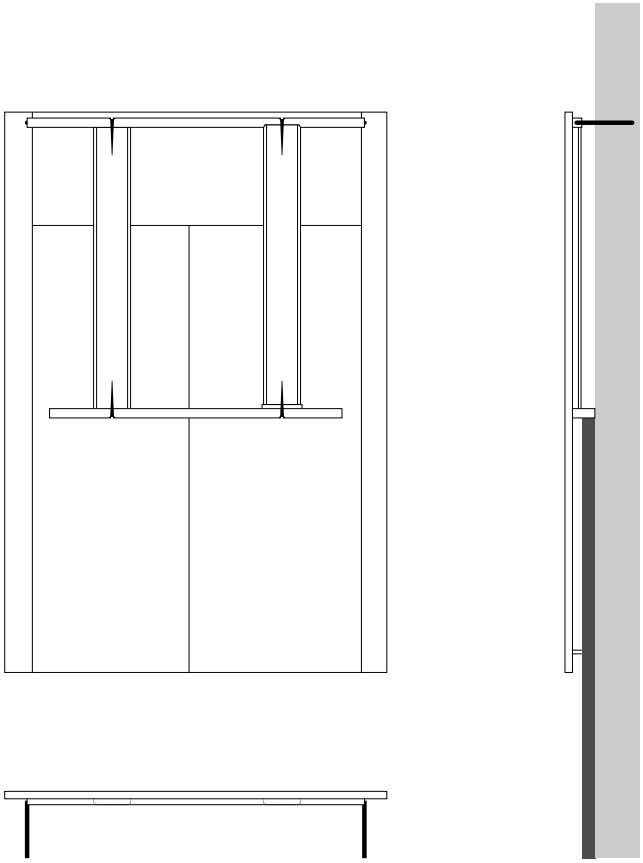


Fig. 16 — First-Angle Projection of the New Hanging Arrangement

Two new battens were prepared and these were fixed to the original vertical chamfered pine battens by screwing into the end-grain of the original battens. The two new battens show up clearly in Fig. 17. Note that the lower batten required a packing piece on the right and that the upper batten required a small section to be cut out on the right.

The lower part of the wall of the ringing room is covered in panelling and the upper part of the wall is rendered clunch. The top of the panelling forms a narrow shelf, 37 mm wide, and the new lower batten sits on this shelf. The weight of the peal board is transferred via the vertical battens to the new lower batten and thence to the shelf.

The right-hand view in Fig. 16 shows a cross-section of the peal board against the clunch wall. The wall is shown in grey and the panelling is shown as a dark vertical strip abutting the wall. The lower batten is shown sitting on the top of the panelling. This batten is located by means of two vertical pins which extend upwards from the shelf into location holes in the batten.

The location pins are not indicated in Fig. 16 but they can be seen in the photograph in Fig. 18 where they show up against the light background of the rendered clunch wall. These pins are screwed into the shelf that forms the top of the wooden panelling. The lower half of the photograph shows the dark wood of the panelling.

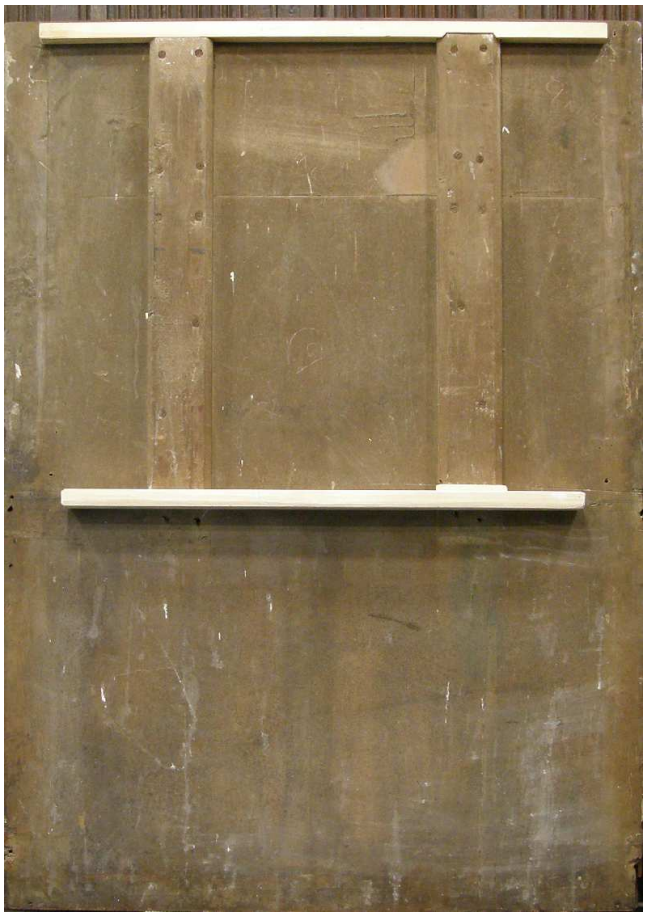


Fig. 17 — The Back of the Peal Board

Two holes were drilled into the wall at a high level and these accommodate two 12mm diameter stainless steel studs. These are shown clearly in the lower view in Fig. 16 where they extend downwards in the figure. In the right-hand view in Fig. 16 the near stud is shown as a horizontal black line at the top.

When the peal board is hung, it is lifted up above the shelf and then down so that the lower batten is located on the two pins. The outer ends of the two studs are then screwed to the upper batten, the screws being driven into the end grain of the batten.

As is clear from the right-hand view in Fig. 16, the upper part of the peal board is some distance from the wall, about 62 mm, but the lower part of the board is also some distance from the panelling, about 25 mm. To prevent the lower part of the board being accidentally stressed, there is a batten screwed to the panelling at a low level. This can just be seen in cross-section in the right-hand view.

One reason for having the board spaced out from the wall and the panelling is that there have been occasional floods. In storm conditions water has run down the inside of the wall and onto the panelling. With the board hung in the way that it is, there is little danger of it suffering from water damage.

Fig. 18 — Two Pins in the Panelling

9 — The Tower of Great S. Mary's

The painting of the church tower in the lower central region of the peal board is of particular interest because we may assume that it shows the upper two-thirds of the tower as it was in 1788. This detail of the peal board is reproduced in Fig. 19.

Fig. 19 — The Tower as depicted on the Peal Board

In the painting, the west face of the tower dominates but there is a foreshortened view of the north face too. Each of the four corners of the tower is surmounted by a turret and the turrets in turn are topped with finials which are capped by balls.

The north-west corner of the tower (to the left of the great west window) is shown with five vertical openings. These suggest a spiral staircase in this corner leading to the top. In reality, the spiral staircase is in the south-west corner (to the right of the window).

The heights of the five openings relative to the neighbouring architectural details are correct. Their incorrect positioning on the north-west corner is an intriguing mistake. If the artist executed the painting inside the ringing room he would have had to climb the spiral staircase many times and would surely have known which side of the window it was.

The painting shows a crenellated parapet and below this there are the louvred windows of the bell chamber. The 12 bells on which the peal was rung were hung in a bell frame on one level.

Below the louvred windows there are the small openings of the room below the bell chamber which is locally known as the Void. It is possible that there was bell frame in this room in the very early days when there were only four bells in the tower.

The west window is depicted in some detail. The ringing room floor is almost on a level with the springing points of the arched top of the window.

It is interesting to compare the 1788 painting with the earliest known engraving of the tower, that by David Loggan in 1690. This is reproduced in Fig. 20.

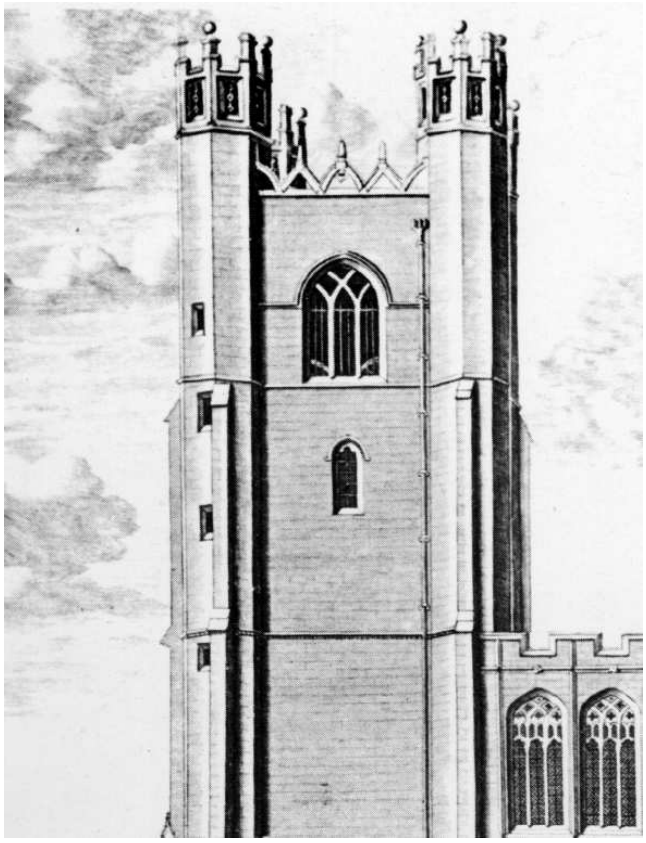


Fig. 20 — The Tower as seen in the Loggan Print of 1690

In this engraving, the south face of the tower is in profile. The south-west corner of the tower is now on the left and shows the top four openings for the spiral staircase correctly, even to the extent that the topmost opening is not quite aligned with the others.

Interestingly, only four openings are shown. The fifth opening down from the top is missing. Loggan engravings are meticulously accurate and it is possible that this opening was added after 1690 but before 1788. Today, the stonework of this fifth opening is a little different from some of the other four but there have been many repairs over the years and it is difficult to come to a firm conclusion.

The Loggan engraving shows the turrets, finials and balls as in the painting but instead of the crenellations there is a crested parapet with minor finials. The crenellations are the result of a remodelling which was carried out some time between 1690 and 1788.

Below the parapet, the bell chamber window is drawn without louvres. In their place there appear to be vertical bars.

There are two most intriguing features in the two bottom corners of the bell chamber window. At first glance these look like diagonal struts but the slight curve on these features suggest that they are really parts of the rims of two bell wheels.

In 1690, there were eight bells in the bell chamber and these wheels could be those of the two heaviest bells.

Fig. 21 — The Tower in 2010

Fig. 21 shows the same portion of the tower in 2010. The appearance is very much like that in 1788. The crenellated parapet is essentially unchanged but the finials and balls that topped the turrets have gone. These were removed in 1841.

Five openings are shown on the spiral staircase, as on the painting but on the south-west corner rather than the north-west corner.

The louvred windows, the Void windows and the great west window are all unchanged from 1788.

10 — Tracery in the West Window

For the most part, the 1788 peal board is very carefully laid out and the execution is of very high quality. By contrast, there is one notable instance of poor draughtsmanship which can be seen by comparing the tracery in the west window as it is with how it is represented in the painting.

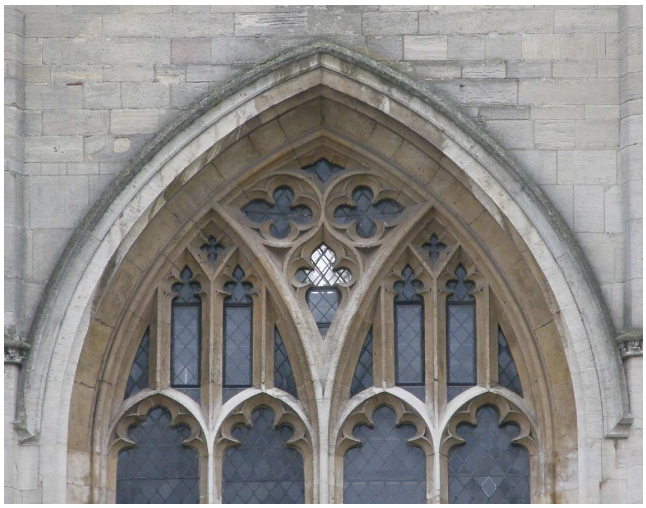


Fig. 22 — The West Window as it is

Fig. 22 shows a photograph of the tracery at ringing room level and Fig. 23 shows the same region as it appears in the painting.

Fig. 23 — The West Window as painted

It is very difficult to draw tracery accurately and students of architecture are sometimes set challenging examples as drawing exercises.

Readers who enjoy spot-the-difference puzzles can see many differences, large and small, between the tracery as it is in Fig. 22 and as it is in Fig. 23.

The artist has the enveloping arch a little too pointed and the details under this arch show poor attention to structural considerations. At the bottom of Fig. 22, there are four small arches, and four mullions rise up from the centres of the tops of these arches. The corresponding mullions in Fig. 23 rise up from points which are off-centre with respect to the tops of the arches and this is structurally unsound.

Fig. 24 — Tracery in the West Window

Fig. 24 is a composite drawing. The left-hand half of the drawing is a close approximation to reality and the right-hand half is a distorted version which reflects some of the errors in the tracery as depicted in the painting.

These errors should not detract from the appearance of the peal board as a whole. This is one of the finest historic peal boards in existence and, now that it has been cleaned and restored, it can be enjoyed by present-day bellringers as a distraction when ringing peals on the new bells.

Appendix — Cambridge Chronicle Report

The transcript below is of a report that was published in *The Cambridge Chronicle and University Journal* on Saturday, January 26, 1788, five days after the peal. This is the earliest known published account. Some later published accounts have almost identical wording but with the date shown as July 30, 1796 instead of 'On Monday last' which clearly refers to Monday, January 21, 1788, which is the date on the peal board.

Apart from the use of a modern typeface, the transcript is a close approximation to the original, with attention being paid to punctuation, spelling, hyphenation, abbreviations, spacing and line-breaks. In particular, the slightly erratic vertical alignment of the ordinal numbers has been copied.

> On Monday last was rung by the Society of Cambridge-Youths, at the tower of St. Mary the Great, in this university, a true and compleat peal of *Bob Maximus*, in 5 hours and 5 minutes, consisting of 6600 changes; which, for the regularity of striking, and harmony throughout the peal, was allowed by the most competent judges that heard it, to be a very masterly performance; especially as it was remarked, that in point of time, the striking was to such a nicety, that in each thousand changes, the time did not vary the 16th of a minute, and the compass of the *last* thousand was exactly equal to the *first*, which is the grand scope of ringing.
>
> The order in which they fixed, was as follows:
>
> | | | | |
> |---|---|---|---|
> | *Treble,* | I. Smith | 7th. | T. Jones |
> | 2d. | W. Bland | 8th. | P. Goude |
> | 3d. | R. Laughton | 9th. | C. Day |
> | 4th. | J. Lawson | 10th. | W. Young |
> | 5th. | J. Coe | 11th. | J. Hazard |
> | 6th. | T. Steers | *Tenor.* | J. Bowtell. |
>
> *Notary* in the steeple, P. Spencely,
>
> The time of ringing this peal shews, that the late Professor Saunderson's calculation is pretty accurate, respecting the time it would take to ring the whole number of changes on twelve bells, which he stated at 45 years, 27 weeks, 6 days and 18 hours, without intermission.

The principal details are exactly as on the peal board down to the abbreviations of the ordinals and the names of the ringers. One minor difference is that after '*Tenor*' there is a full stop in this report but there is a comma on the peal board.

The transcript was made from a microfilm copy in *The Cambridgeshire Collection* in the Cambridge Central Library.