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“Masked balls”

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The Charles Close Society was founded in 1980 to bring together all those with an interest in the maps and history of the Ordnance Survey of Great Britain and its counterparts in the island of Ireland. The Society takes its name from Colonel Sir Charles Arden-Close, OS Director General from 1911 to 1922, and initiator of many of the maps now sought after by collectors.

The Society publishes a wide range of books and booklets on historic OS map series and its journal, *Sheetlines*, is recognised internationally for its specialist articles on Ordnance Survey-related topics.

Masked Balls

Rob Wheeler

Figure 1 (*below left*) shows an extract of an engraved map of 1796, before the Ordnance Survey had produced its first map. It shows *detail* – roads and rivers – and *names*. The engraver has tried to position names where they are clear of detail, but he hasn't tried all that hard and, if the two intersect, neither gives ground to the other.

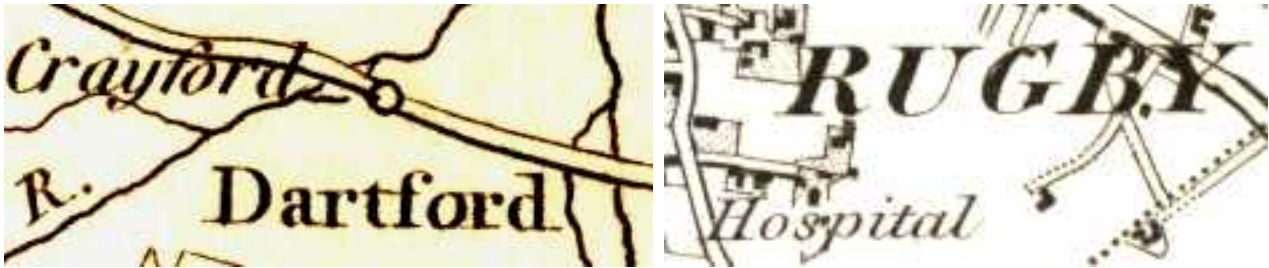
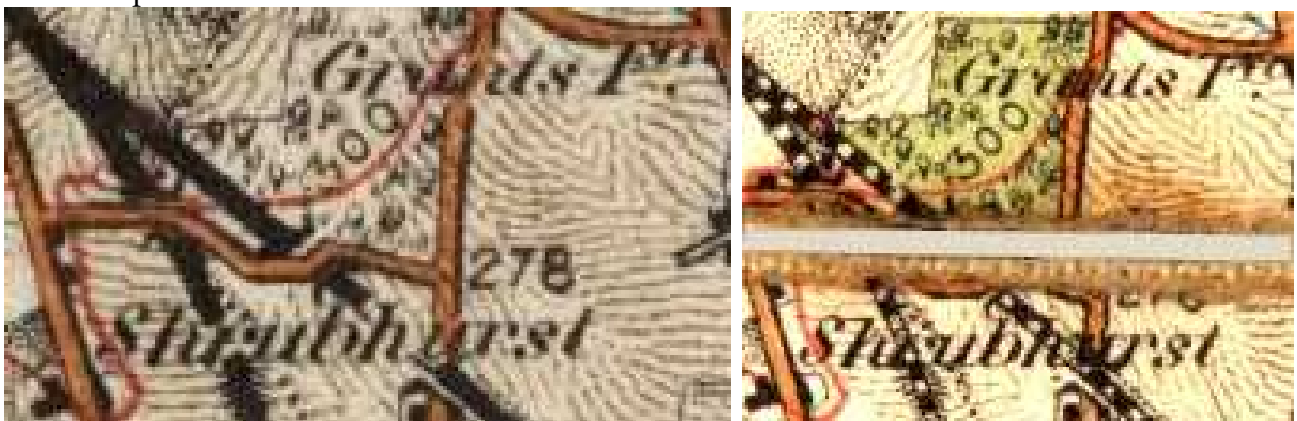


Figure 2 (*above right*) shows an extract from OS Revised New Series sheet 184. The engraving is far superior but the same principle is followed. A fairly superficial inspection of different series suggests that the first systematic departure from this came with the introduction of the Revised New Series in colour. For this edition, multiple-track railways were redrawn in solid black. Carrying such a railway over a name was liable to render it illegible, and because the line was being drawn afresh in litho it was no trouble to stop it short of the name. Figure 3 (*below left*) shows the 'Second Coloured' sheet 287; figure 4 (*below right*) shows the same extract from the Third Edition, which retained the old engraved detail. Normally the new railway symbol would simply obliterate the old, but where it was broken – as for the name *Shrubhurst* – it would have been necessary to clean off the old detail, a fiddly job but one that was being done elsewhere. More interestingly, this cleaning off was not limited to railways. The removal of the casing of roads where they cross a name is not so easy to spot, but *Grants Fm* on the same extract provides an example. Note particularly the way the road borders to the north of the name come right up to the letters on the 3rd edition; note also the eastern border visible between the two minims of the 'n' – as a result of a kink in the road it is parallel to them. In contrast, on the second edition the road casing stops well clear of the lettering, while the sienna road fill carries on uninterrupted.



The next development came with the use of dimensionally-stable film for scribing, a technique still being used on the CCS's early visits to OS. Different films were used, not just for the different colours but for different types of information within a colour. In particular, (black) lettering was normally on a different film from detail, even though it would in due course be combined with it to produce a single plate for printing.

Combining two films could be done simply by placing them in coincidence and re-photographing, and this can be thought of as the logical operation OR. Taking a negative corresponds to the logical operation NOT. The operation AND can be derived from these, since $A \text{ AND } B = \text{NOT}(\text{NOT}(A) \text{ OR } \text{NOT}(B))$.

By photographing out-of-focus and with a degree of under-exposure, an image could be coarsened, so that lines became wider while the overall scale remained unchanged; let us call this operation BLOAT. If one now replaced the detail film by Detail AND NOT(BLOAT (Lettering)) that automatically created a 'hold-out mask', removing just as much detail as was necessary to create a white halo around the lettering.



This technique was used when the Second Series 1:50,000 was drawn in the mid 1970s. Figure 5 (left) shows an extract from Sheet 115(A). Note the way that the road border reappears as a mere dot in the middle of the 'b' of Rachub: this is something that would never have happened with

manually broken detail and it tends to improve its legibility. Note also the way the wood boundary is broken for the 'O' of Ogwen. Masks were produced from black, blue and red lettering. Note also the '+' symbols for chapels: detail is broken around these too, whereas the 'b' of Rachub is allowed to run into a '+' without any break. It would appear that some black symbols (churches, position of antiquity, public telephones) were treated as lettering rather than detail so far as masking was concerned. The masks (or probably a single composite mask) were applied to black detail only; other colours were unaffected.

So far, so good. The story now moves on to the late 1970s, a time – viewed in retrospect – when new ideas at OS were greeted with uncritical enthusiasm. The *Routemaster* 1:250,000 was born in this era and was an early application of 4-colour printing. One of the new ideas was for a themed series of photographic covers: nine different road bridges were selected, one lying within the coverage of each sheet; the back cover carried a paragraph explaining the engineering or historical significance of the selected bridge. Historical engineering structures tend to appeal to CCS members so it is perhaps surprising that this aspect of the series has never attracted attention in *Sheetlines*. The appeal of such photographs to casual map purchasers was perhaps more muted, and the pictures were replaced

about 1985¹ by picture-postcard scenes of more general interest.

But the development of relevance to this article was the extension of masking beyond black detail. The table below lists for black, red and blue lettering respectively, which films were masked in respect of that colour lettering.² (Ignore the entries in blue for the present.) Thus enough black detail was omitted to give lettering in all three colours the desired halo; for other films the treatment varied according to the colour of lettering. The question mark in respect of magenta appears because its use as solid colour is so sparse. Thus I could find no instances on the maps which would show whether masking was used, although it is difficult to see why the extra work should have been undertaken to so little purpose.

	Black L	Magenta L	Blue L	Blue screen, dense
Black detail	Y	Y	Y	N
Black screen	N	Y	Y	Y
Magenta detail	N	?	N	?
Magenta screen	N	Y	N	N
Yellow	N	N	Y	N
Blue detail	N	Y	Y	N
Blue screen, faint	N	Y	N	Y
Blue screen, medium	N	Y	N	Y
Blue screen, dense	N	N	N	

Actually, it is difficult enough to see what purpose was served by masking anything other than the black detail: the *Landranger* series manages perfectly well without it. The added complication may seem harmless enough. The problem is that tidy masking depends on exact registration during the masking process, and registration in preparing the *Routemasters* left a lot to be desired, though few maps were as bad as my B edition of Sheet 9, of which an extract



appears at figure 6 (left). There is a vertical misalignment here of about 1.5mm with the consequence that the masking of both blue screen (for sea) and of the black grid-line comes well below the road number. Road numbers superimposed on woodland could look odder still. Recall that road numbers at

¹ Pencilled date on cover cards in CCS Archives, OS 255.

² Based on inspection of 'B' editions.

this date were to appear red, so are magenta with yellow; the green of woods is blue screen with yellow. Thus there was no reason to mask yellow. Figure 7 (*below left*) shows a road number near Lyndhurst on this same sheet. The clearing in the wood produced by the mask is consequently filled in yellow. Note that the masking of solid blue did not suffer this alignment problem. These two examples also serve to demonstrate that road numbers stand out perfectly well against sea or wood without any masking.



All this may seem bad enough, but worse was to come. The 'C' edition of this sheet introduced a green rectangle to highlight Primary Town names - ie those that would be signposted as destinations of Primary Roads. Primary Town green was a bluer shade than wood-green, involving a denser screen of blue overlain on yellow. What was to be done if this rectangle intersected a wood? The answer, probably inevitable, was that the rectangle should take priority over the wood tint. This was achieved by preparing the denser blue screen on a separate film and masking the other blue-screen films with it. The black screen was also masked. This is shown by the entries in blue in the table above.

For this, a tidy result depended on much more precise registration than was needed for a halo. This was rarely achieved. Figure 8 (*above right*) shows the effect where the rectangle overlays sea. In this case we have a white fringe to the rectangle on the top and right-hand sides, a dark fringe on the other two sides where medium and dense blue screens coincide.



This was not the only problem introduced by revision. If a few new road numbers were introduced, did all the masks need to be re-done? Looking at the 'B4096' that appears at SU0168, I think the answer must have been 'yes'. The 'C' edition also introduced an Old English 'M' for ancient monuments. This appears to mask the medium-blue screen but nothing else. Moreover the masking is odd – see Figure 9 (*left*) – in that the space between the legs of the 'M' is wholly white but there is little or no white to either side. This applies consistently across the sheet. I believe that this represents a rectangular mask applied manually.

To continue the history of *Routemaster* masking through the numerous successive editions would be as tedious for the reader as it would be laborious for the author. More interesting is the question of how things went astray. A couple of 'Sixth Series' proof sheets in the CCS archives³ throw some light on this.

The first is stamped with the date 3 October 1977 and is a traditional 7-colour

³ OS 211 16 & 17. Evidently the *Routemaster* name had yet to be devised.

sheet broadly similar to the previous series. The '2nd Proof' is dated 6 December 1977, introduces yellow for built-up areas and drops the boundaries for woods. Brown has been replaced by screened red on yellow but green appears to be retained as a separate colour with a series of screens used both for hypsometric tinting and for woods. The red lettering is masked on various films, including the blue screen used for sea; no masking for blue lettering is being done yet. The result looks most unsatisfactory, the principal problem being confusion between woods and the hypsometric tinting. I suspect that dealing with this and eliminating the green plate took everyone's attention; minor difficulties with masking were, shall we say, masked.

Colby's grave

Below is the inscription on Colby's memorial in St James' cemetery, Liverpool Cathedral, visited by the Society in July.

Sacred to the memory of Major General Colby RE of Pant Y Deri
Pembrokeshire.

His powerful mind and superior scientific achievements were devoted to that great work with which his name will ever be associated, the Ordnance Survey of Great Britain and Ireland, the charge of which was confided to him by the Duke of Wellington.

Nor was it by this illustrious individual alone his abilities were acknowledged. He was known and valued by most of the distinguished men of his time, was a member of the Royal Societies of London and Edinburgh, of the Royal Irish Academy and of other learned bodies.

Knight of Denmark and an honorary LLD of the University of Aberdeen.

Born at Rochester September 1st 1784, he died suddenly at New Brighton near Liverpool October 2nd 1852 leaving a widow and seven children who mourn their irreparable loss.



Too bad the stonemason didn't have auto-correct turned on