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"Bartholomew's Half inch Reduced Ordnance Survey of England & Wales"

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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.

Bartholomew's Half-inch Reduced Ordnance Survey of England & Wales

Rob Wheeler

The *half-inch series* (as I shall refer to it for brevity) like most of the firm's other maps, was engraved on copper so far as the detail was concerned, being printed from a transfer to stone. Engraving was expensive but it produced crisp detail and, because the plates were only used for printing transfers, that crispness remained to the end of the life of the series in the 1970s.

The fullest account of the series, by Tim Nicholson,[1] concentrated on layer colouring. Because so much of the cost was tied up in the plates, this article includes the earlier unlayered versions as well. In that respect it follows Eugene Burden,[2] who attempted to list all the early printings, based on the firm's Print Record, now part of the Bartholomew Archive at NLS.

Updates were added to the copper throughout the life of the series, with superseded material being deleted as necessary. One consequence is that the plates may have started life in the 1890s but in their current form they show the maps as they were in the 1970s (*Figure 1*).

Figure 1.: Plate for sheet 29 showing M3 with Hook exit.
(NB: image reversed for legibility)

Because maps could be produced by 'patching up' - taking transfers from multiple plates and joining them on the transfer paper - the plates were not rigidly tied to particular map sheets. Instead, they were based on blocks of the OS New Series, normally 3 sheets by 3. This gave a grid of

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[1] Tim Nicholson, "Bartholomew and the Half-inch Layer Coloured Map 1883-1903", *Cartographic Journal*, 37(2), 2000, 123-145.

[2] Eugene Burden, "Early Issues of Bartholomew's Reduced Ordnance Survey of England & Wales", *Sheetlines* 56,22.

non-overlapping plates which often corresponded directly to a published map (apart from the overlaps) but not always. For example, the block pattern produced a plate, 'Thames Estuary' with part of Essex, part of Kent, and water in between; south of this was a plate 'Dunge Ness' which covered that part of Kent south of Dover (*Figure 2*). When the firm came to produce a map of Kent, it joined a patch from the southern part of 'Thames Estuary' to one covering the northern part of 'Dunge Ness'; by using a non-standard paper size it was able to create a map of the whole county outwith the London suburbs.

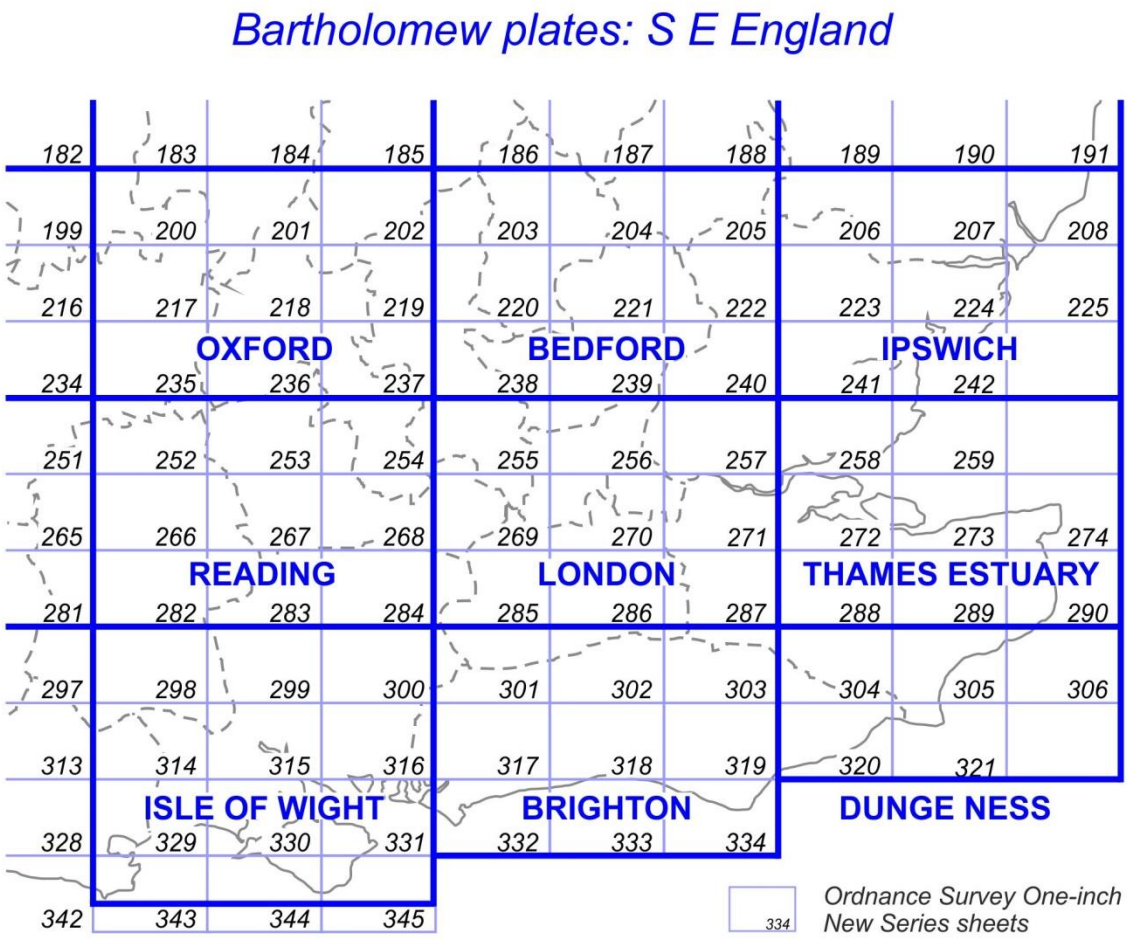

Figure 2. Plates in SE England.

The early sheets

As first produced in 1891, the series was unlayered and almost uncontoured - having just a 500ft contour. Visually, they were pleasing maps - *Figure 3* - with brown main roads, green woods and parks, blue water, grey vignetting to pick out county boundaries, and a pink for built-up areas. This last tint was the least successful, being applied inconsistently, and not really adding much to the black detail.

In terms of utility, the series was more questionable. The problem was that the New Series - and as yet the Revised New Series had not been

authorised - made little distinction between minor roads and footpaths. The experienced user can usually tell the difference from clues in the engraving; but the clues seem to have been too subtle for Bartholomew's draughtsmen. In consequence the maps showed a lot of roads that were unusable or even defunct.

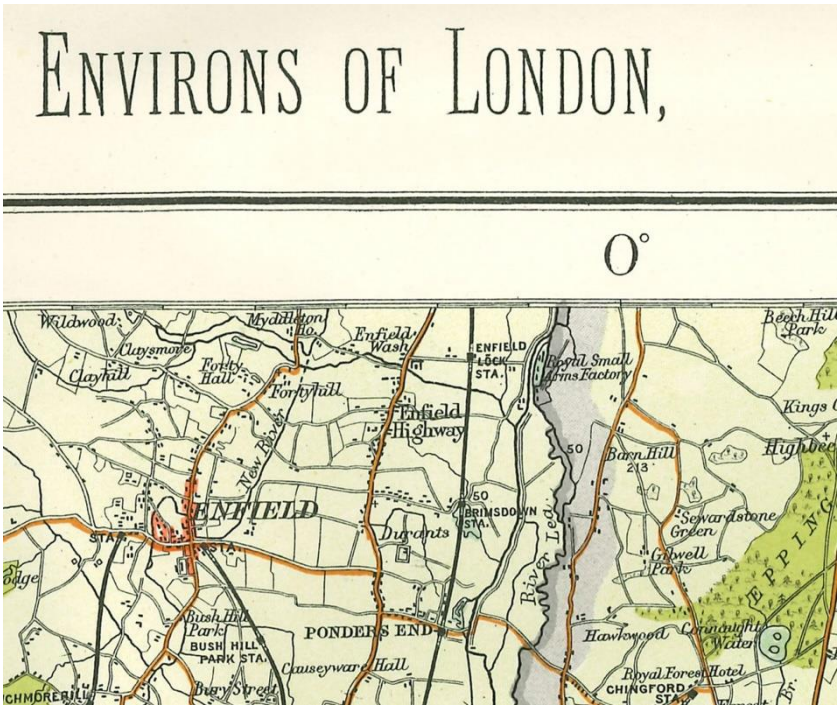

Figure 3. Environs of London, 1891.

The maps were included by WH Smith in their Travelling Maps series and that is the form in which most copies seem to survive. They all duplicated titles already available in that series at the quarter-inch scale; they sold at 2s cloth, compared to 1s for the quarter-inch. So by paying double the price, the user could have a map which looked much nicer, covered a smaller area of ground, and whose additional detail was unreliable. Sales appear to have been poor: none of the early sheets went to a reprint in that form; and a copy of the London sheet is known with covers dating from 1897 or 98.

The London sheet is quite a discovery.[3] Printed 27 May 1891 (2045 copies) it was the first of the sheets to appear. It was not listed by Eugene Burden because it never became a numbered sheet - for reasons that will be explained. It was followed in the next couple of months by Environs of Brighton with Sussex Coast and Watering Places of Kent, fancy titles for what were in essence maps of Sussex and of Kent.

For the next two years the only developments seem to have been responses to specific customers. Perhaps the poor sales of the first three sheets were blamed on the distribution arrangements and a decision was

[3] Acc. 10222/PR/17 folio 101. I am grateful to Chris Fleet for searching the Print Record: the listings do not give scale, and *Environs of London* was a common title.

taken that no further sheets should be issued until new arrangements were in place. However, in 1892 a *County of Surrey* sheet was printed, showing Parliamentary constituencies. This constituency information was on a red stone; but within the non-metropolitan part of Surrey the red constituency boundaries were reinforced by dotted lines on the black. John George Bartholomew would observe in his evidence to the Dorington Committee that registration errors were unavoidable; therefore anything where accuracy was important needed to be engraved, with colour used merely to emphasize and enhance. The implication is that constituency boundaries within non-metropolitan Surrey needed to be shown exactly. The map was printed 6 June 1892; voting in the General Election of that year was in July. It looks as though the map had been prepared for use by canvassers for one of the parties: when a constituency boundary runs along a road it really is important that canvassers should know which constituency they are in. The map could be made up from a large part of the London plate along with the northern portion of the Sussex plate to its south, so little additional engraving was required: just the constituency boundaries and a small extrusion SW of Farnham to ensure the whole of Surrey was included.

What happened in 1893 was at the other end of the country. A *History of Northumberland* Committee was preparing a parish-by-parish history - a local development that anticipated the national *Victoria County History*. Each volume would require a map showing the parish or parishes covered, the townships into which they were divided, and as much topographical detail as possible. It looks as though a member of the committee was familiar with Bartholomew's half-inch Scottish maps, which for some counties (*eg* Dumfriesshire) showed parishes, and asked for a Northumberland equivalent but showing townships as well - a unit that did not exist in Scotland. Bartholomew was happy to oblige, putting the township information on a red stone but engraving parish boundaries (and names) on copper. The use of the Scottish series as a model led to railways reverting to ladder-pattern, but also to a much more useful contour interval.[4] Each volume required only a small portion of the county to be engraved and the price the Committee was charged for the map was probably sufficient to pay the entire engraving cost of each portion.

One adverse consequence of these opportunistic special projects was that the plates acquired boundaries which were considered too troublesome to delete. Thus Northumberland continued to show the names and boundaries of its ancient ecclesiastical parishes right up to the demise of the series in the 1970s; and likewise Surrey continued to show the boundaries of the 1885 constituencies. I suspect Bartholomew was fairly relaxed about this: Northumberland merely followed the pattern set by some of the Scottish counties; as for Surrey, there was a long tradition of

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4 Acc. 10222/PR/20a fol 12b; PR/26b fol 116a.

copper plates marked with barely discernible boundaries that related to something that no longer mattered.

In 1894 a new route for sales was tried. Bartholomew had an established relationship with the Norwich firm of Jarrold and had already produced a Norfolk map for them. This was joined by Essex and Suffolk maps from the half-inch series. The format followed the pattern set by London, except that parks were now rouletted.

In 1895 a South Devon sheet was produced, in layered form.[5] In June, Surrey was re-issued in layered form. Print runs were just 1500: although the layered half-inch had established itself in Scotland, there may have been doubts about its appeal in England. But the experiment was a success: both sheets went to a reprint in the autumn of 1896. Even if we assume that most sales were over the summer so this represents two years' demand, it is nevertheless clear that these sheets sold far better than the unlayered ones. This was about the time that bicycling was taking off as a popular acivity. Hills mattered more to cyclists than to pedestrians, and layer-colouring made it easy to assess a potential route as to the amount of hill-climbing that might be required. The following year a North Devon sheet was added and the Sussex and Kent sheets were re-issued in layered form. Thereafter there was no looking back. From the autumn of 1897 the sheets bore numbers, a clear declaration of intent to cover the whole of England and Wales, something eventually achieved in 1903.

The sheets were generally arranged in vertical columns corresponding to the plates. Because the Surrey sheet wholly duplicated coverage of the London and Sussex sheets, it would have been logical to drop it. But Surrey sold well in its layered form; sales of London (still unlayered) were miserable in comparison. Whilst a layered London might have sold better, part of the appeal of Surrey must have been that it included the North Downs, whereas London would only include their northern slopes. Thus the decision seems to have been taken to retain Surrey and drop London. By minimising the north-south overlaps in this column it was possible to recover the east-west alignment of sheets by the time the line through Hull was reached (*Figure 4*).

Once the decision had been taken in 1897 to cover the whole country, there seems to have been a change to the process followed. Hitherto, a draughtsman had produced a *model*, presumably at the half-inch scale, and the engraver followed this model. There was rarely any generalisation, rather a selection of features and names that could be omitted. The draughtsman produced a free-hand version of the OS and often his copying leaves something to be desired. In contrast, for the sheets issued after 1897, the engraver seems to have worked directly from a photographic reduction of the OS on which features not to be shown had been erased or

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[5] Or re-issued: see later discussion.

crossed out. So if a road was to be shown, it appears as an exact reduction of the OS. One side-effect is that far more names are included than hitherto along the right-hand edge of the plate and, because names on the half-inch took up proportionately more space than on the one-inch, far more names are allowed to break the eastern neatline of the plate. (The western neatline was broken more rarely because names are generally placed to the right of the objects in question.)

From the size of print runs and their frequency, it is clear that sales steadily increased; and what might have seemed a commercial failure in 1892 could now be regarded as a massive success.

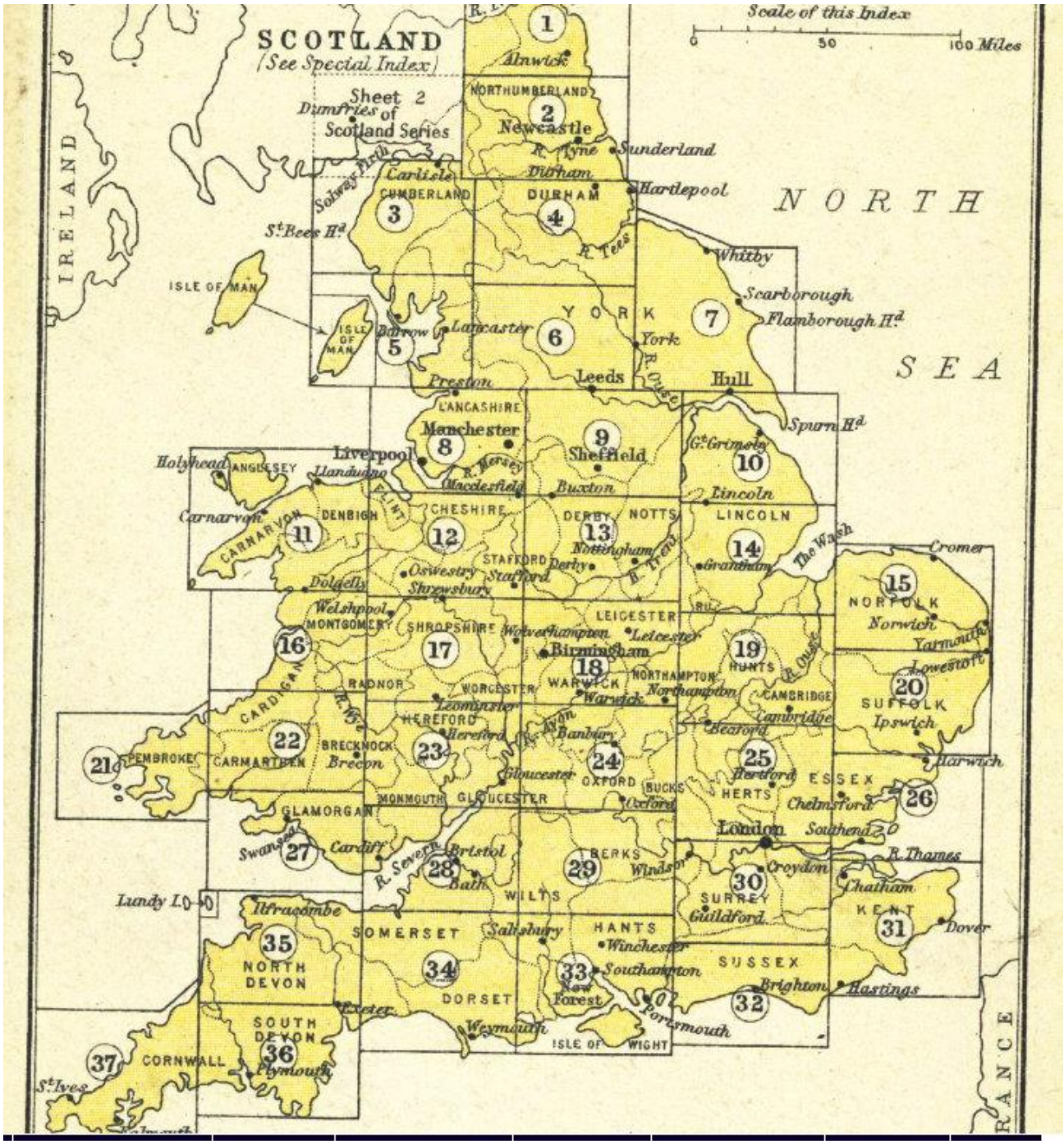

Figure 4.

Digression: the South Devon precursors

The appearance of the South Devon layered sheet in May 1895 might at first seem a major leap to a new part of the country, but the firm's production of half-inch sheets for the area has a long history. It starts with the acquisition of a plate by Cary made 1813 from the one-inch Old Series of 1809 and updated - perhaps in the 1830s - to show the new coastal turnpike road (now the A379) approaching Torquay from the north. Torquay was immensely fashionable so was a priority for updating. At this stage, the turnpike followed what is now the St Marychurch Road all the way to the town centre. This was added, rather coarsely, to the original plate. Babbacombe Road, the present-day approach, did not yet exist.

Then Bartholomew produced his own reduction - *Figure 5*. It shows 'Babbicombe Road', and sundry other place names thereabouts have been added to the Old Series names. In particular, three mansions on the outskirts of Torquay standing in substantial grounds appear: Bishopstowe to the north, Kilmorie to the east and Pilmuir to the west. All were at least ten years old when the military-inspired large-scale survey was done in 1863 and all appear on the six-inch sheet Devon 116 published 1869; furthermore this sheet uses the spelling 'Babbicombe Road', so seems quite likely to have been the source for the Torquay updates. Note, however, that this was not a general revision of Torquay based on the six-inch, but miscellaneous changes made to a reduction from the Old Series one-inch.

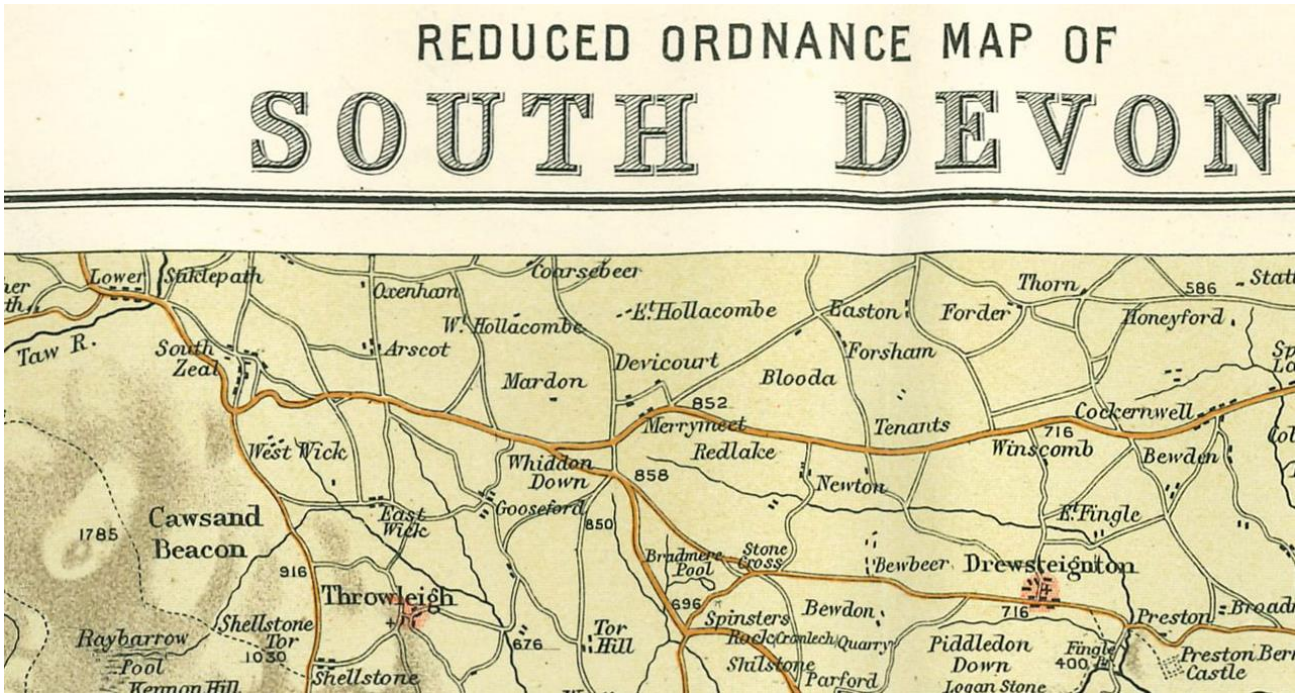

Figure 5. South Devon (Acc 10222 PR20b fol 133b) of 1894.

Visually, the map is quite pleasing. The engraving is neat. Railways, as always, have been added to date, still in ladder-pattern and picked out in red. Main roads are brown, water blue, and built-up areas pink; but there is no green. Hills are in grey, presumably on a separate stone and using a

hill-shading technique unlike almost anything else the firm produced at this scale. There is a copy of March 1894 in the print record, which notes that just 525 copies were produced. This can scarcely have been a new product at this date, not least because so small a print run would make a derisory contribution towards engraving costs.

This provides the background to a sheet that Tim Nicholson describes, whose heading reads "New Reduced Ordnance Survey of England & Wales" (top left) "South Devon" (top centre) and "By John Bartholomew, FRGS" (top right). All this is consistent with the early unlayered half-inch sheets described above, but this sheet was contoured. Of that, there can be no doubt, because Tim records a note apologising for approximate contours around Plymouth (where the OS omitted them on security grounds). Brown roads were described as 'main driving roads' rather than 'driving and cycling roads', the term used on the 1895 map. For this reason, Tim considered the map was earlier than May 1895; he seems to have regarded the map shown at *Figure 5* as indicating that it was no earlier than April 1894. But he failed to find a copy in the Print Record. That alone would not be a problem: Eugene Burden records a couple of half-inch states that do not appear in the Print Record, so clearly it is not absolutely complete. But producing a map requires labour, paper, ink and printing presses; and the firm expected the use of these to be booked. Chris Fleet has very kindly searched the Order & Cost Book, the Day Book, and the Job Register for this period without finding anything that might be a reference to this job. I am inclined to assume, therefore, that it is somewhat earlier in date and that its existence was perfectly compatible with a 'top-up' print run for an obsolete Old Series product that some customer was still attached to.

No doubt funding will eventually be found for digitising or calendaring these Bartholomew records; until then, the origins of both the hill-shaded Old-Series *South Devon* and the contoured New-Series one must remain a mystery.

Joining Scotland and England

The pattern of the English plates and their names would be consistent with an original intention to engrave the whole of England as a reduction of the New Series, so on the Cassini projection. A set of English maps with white space corresponding to Scotland and a set of Scotttish maps with white space corresponding to England would mirror what the OS did; but Bartholomew (or his sales people) saw this as unsatisfactory. The trouble was that Scotland, being on the Bonne projection, would not fit against England.

A solution of sorts was to recognise that Scotland formed a solid mass on the Bonne projection and was already engraved. The parts of England away from the border, once engraved on Cassini, would equally form a solid mass. It is plausible that all the complete New Series sheets - *ie* those containing no part of Scotland - were to be engraved thus. This would

produce a zig-zag line below which everything would be on Cassini and above which a certain amount of fudging - 'shining up' was the term often used - would fill the space up to the border. Such a process required two things:

a. The position of this zig-zag line relative to the Scottish border needed to be fixed. There was no 'correct' solution: it was a matter of finding a position where the fudges would be least noticeable. Once this position had been fixed, the zig-zag line and the Scottish border would serve as an overall control for what was done in between them.

b. Either (i) an overall model for the whole intermediate area would be drawn, which the engravers would follow; or (ii) the intervening area would be drawn as a series of sections, corresponding for example to particular half-inch sheets, but with provision made for shining up at their edges, so that the fudges of the different sections agreed at their joins.

One of the things that influenced events was that the old unlayered Scottish sheets were all in existence by 1891 and included substantial portions of England, albeit mostly as white space. Their conversion to layered form, which normally involved the extension of detail to their neatlines, was more advanced than the English series. It also reduced the amount of copper needed to employ so far as possible what at present were white areas rather than engraving on new English plates.

All this applied to the whole border area. I want to concentrate now on the Holy Island plate and the Scottish plates to its west (*Figure 6*) because there are irregularities in that plate as it stands at present, which I hoped to explain.

The first development came in April 1894 when the new, layered, version of the Berwick & Haddington sheet appeared,[6] including for the first time full detail within Northumberland. This sheet was smaller than the old version, stopping a mile west of the former eastern neatline and well short of the former southern neatline. In fact it stopped 2 miles short of the southern neatline of the Berwick plate. This plate edge adjoined the northern edge of The Cheviot plate, which was the basis of the Moffat and Hawick sheet. Thus, until this southernmost fringe of the Berwick plate was engraved it was impossible to produce the next Scottish sheet to the south - or at least if it were produced it would not even abut the Berwick sheet, let alone have the customary overlap. So there must have been some compelling reason for not engraving the entire plate; and that reason was almost certainly (b)(ii) above - leaving a band for any necessary adjustment to match what was being done when The Cheviot was extended. There is no indication of (a), and in particular no sign of any control for the map's extension. The view was perhaps taken that for an extension that never exceeded 11 miles the absence of control would not be a problem. Perhaps

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6 Acc. 10222/PR/20b fol 158d

it wasn't. What certainly was a problem was that the position of the English Cassini material relative to Scotland needed to be fixed so as to facilitate the best all-round fit; it could not be driven solely by the needs of northern Northumberland.

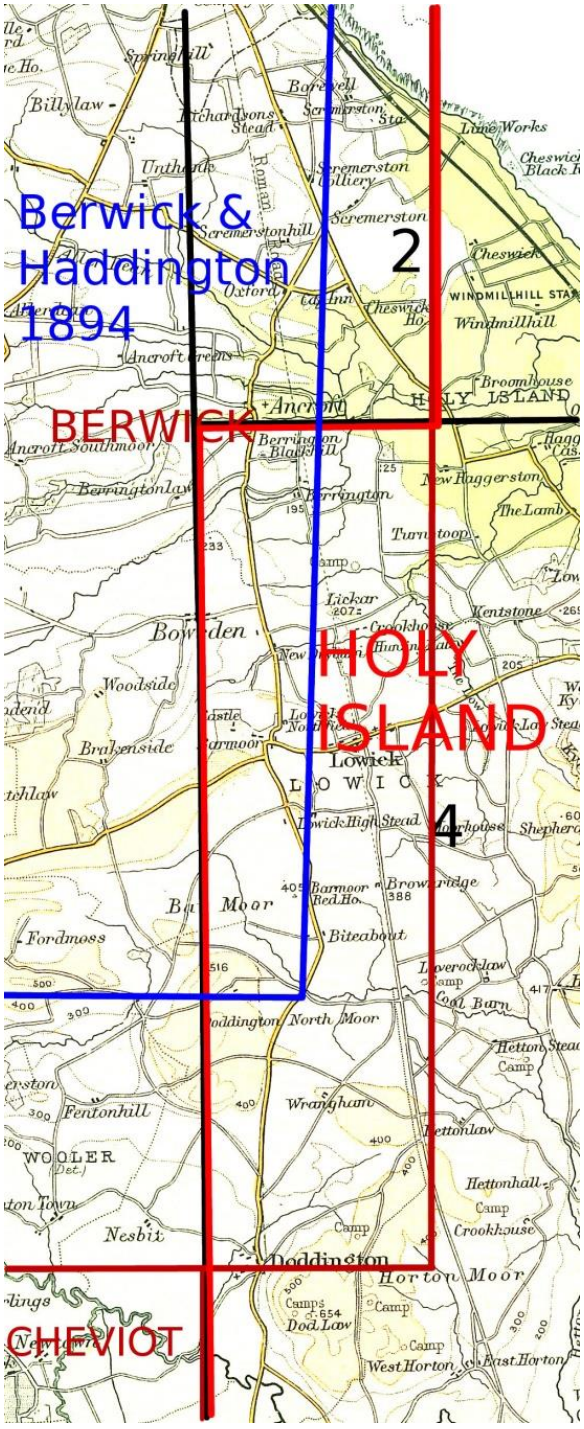

Figure 6. Holy Island and Berwick. OS New Series sheetlines are in black, Bartholomew maps in blue, Bartholomew plates in scarlet (English series) or magenta (Scottish).

The fixing may have been done after 1894, but it was certainly done by 1897 when the English Sheet 1 was produced. The 'zig-zag line' in this area ran mostly along the edges of New Series sheets wholly in England - the northern and western edges of sheet 4 and the western edge of sheet 6 - but it also included a portion of sheet 2 that could not be accommodated on the Berwick plate. And, most seriously, the fixing placed those sheets almost half a mile further north compared to the best local fit.

These sheets were engraved on the Holy Island plate as a direct reduction of the New Series. Everything to their west was to be taken from the Scottish plates - Berwick and The Cheviot. (We know this because the join of patches is visible in places.) The problem was that there was a step-change of almost half a mile where the two sets of plates met. This required shining up along the fringes of both plates. It was a fairly crude process which must have been based on local models that were little more than freehand sketches of how to resolve particular difficulties. Thus, around Barmoor Castle and Bowsden, junctions on the main N-S road had been shifted northwards on the English plate, so roads joining them from the west - ie from the Scottish plate - needed to be realigned from their true, easterly, course so as to run almost in a north-easterly direction. Wooler was divided between The Cheviot and Holy Island plates, and became very distorted. *Figure 7* shows Bartholomew's representation on the left and the Revised New Series on the right. The triangle of streets that formed the western edge of the built-up area lies at the NW corner of the town in reality but at the SW corner on the half-inch. In other places the adjustment is less noticeable: around Doddington little of importance crossed the fault line; and along the Sheet 2 line a similar distortion of roads east of Scremerston affects features to which no one paid much attention. The treatment of the East Coast Main Line at this point is quite skilful: major railways cannot be given tight turns and here the loss of almost half a mile is accommodated by subtle adjustments of angle which leave the position of the railway relative to the coast more or less where it ought to be.

Figure 7. Wooler.

In 1899, a new version of the Berwick sheet was produced.[7] This time it extended south right to the edge of the Berwick plate (which must of course have been engraved by 1897 when the English sheet 1 was produced). Its eastwards extent was unchanged from 1894. As in 1894 it was to be produced solely from the Berwick plate, even though it overlapped the English Holy Island plate.

The adjustments made to the Berwick plate in 1897 to make it agree with Holy Island introduced discontinuities with the remainder of the Berwick plate - its eastern fringe. Those adjustments were part of the firm's topographic database; consistency with Holy Island had to be maintained. Therefore alterations were made to the eastern fringe of the Berwick plate so that it agreed with the altered part further west. But work in 1899 was kept to a minimum. Thus the 1894 work within Northumberland had used a 500ft contour interval (which actually meant a complete absence of contours). For the 1897 production of Sheet 1, a much closer interval had been engraved, but only on the part of the Berwick plate to be used for that sheet; the eastern fringe still had no contours. What happened in 1899 was that a couple of contours that related to layer changes were added on the stone. They were intended as far as possible to agree with the warped detail rather than following the original New Series contours; but of course such contours could only be estimated.

As a consequence, for this small part of Northumberland there were two half-inch depictions: an official one used for the England sheets (*Figure 8b*), and a Scottish one used for the Berwick sheet and the Scottish atlas (*Figure 8c*). These were based on the Holy Island plate and the eastern fringe of the Berwick plate respectively. Both were deficient in one way or another: the 1894 depiction (*Figure 8a*) agrees best with the New Series. This situation seems to have continued at least until the 1920s.

The join between the Berwick and the Holy Island plates corresponded to the western edge of New Series sheet 4 for the full height of that plate. In contrast, the western neatline of the *present* Holy Island plate steps back a mile at the point where it abuts the Berwick plate and runs parallel to but to the east of the edge of sheet 4. All this represents a re-engraving at some date no earlier than the 1920s.

This article started with an engraved depiction of the M3. The Holy Island plate should serve to remind us that these plates were a living database and as such were subject to quite major re-engraving. Sometimes it is obvious, sometimes less so. Before declaring some feature of the plate to be original, it is important to compare the detail to an early printing. A few additions (especially of modern features like power lines) can be regarded as 'safe' but as soon as changes are spotted to a lot of 'ordinary'

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[7] Acc. 10222/PR/30c fol 215

detail like roads and woods, the possibility of wholesale re-engraving must be considered.

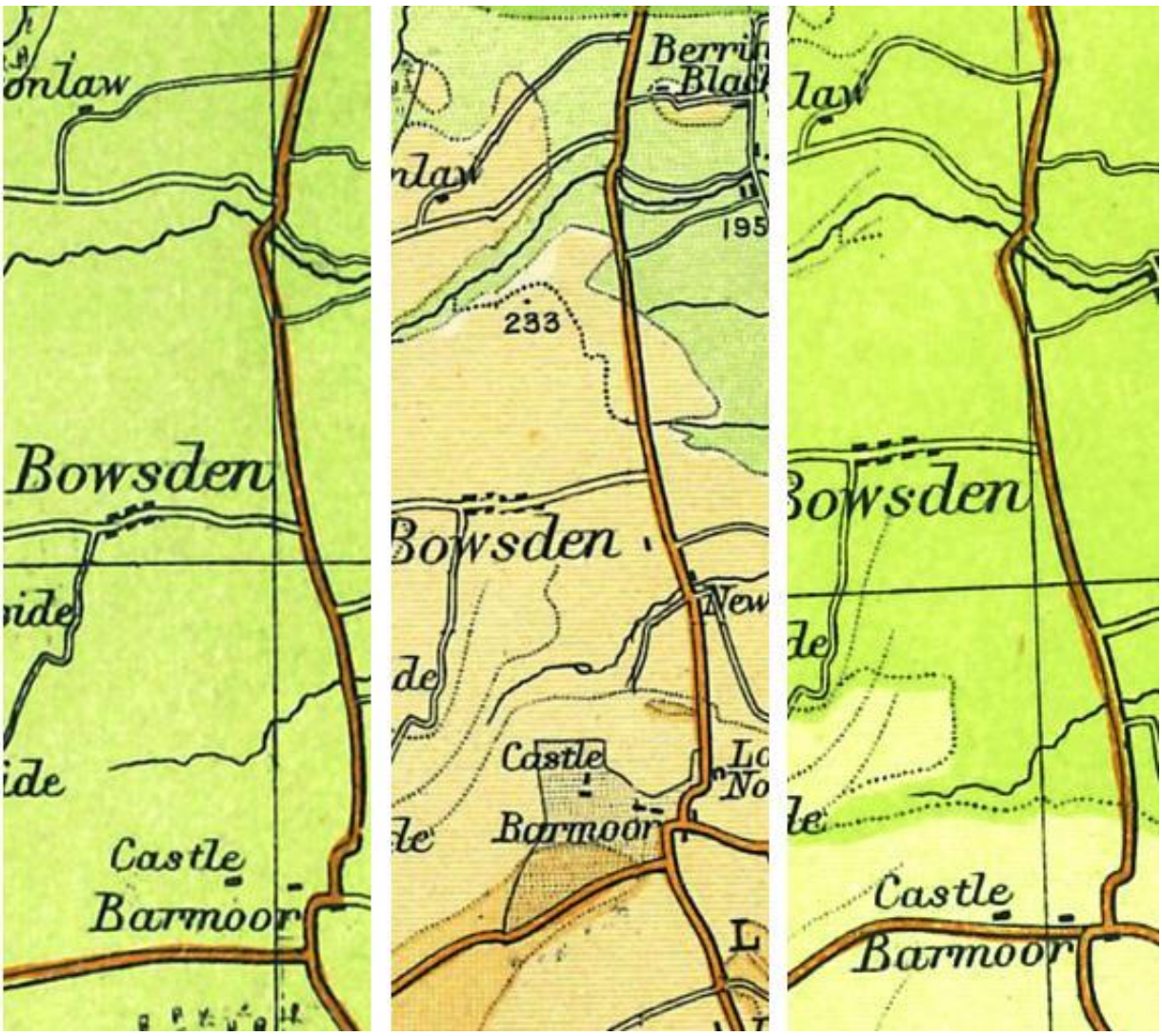

Figure 8 a,b,c Barmoor Castle