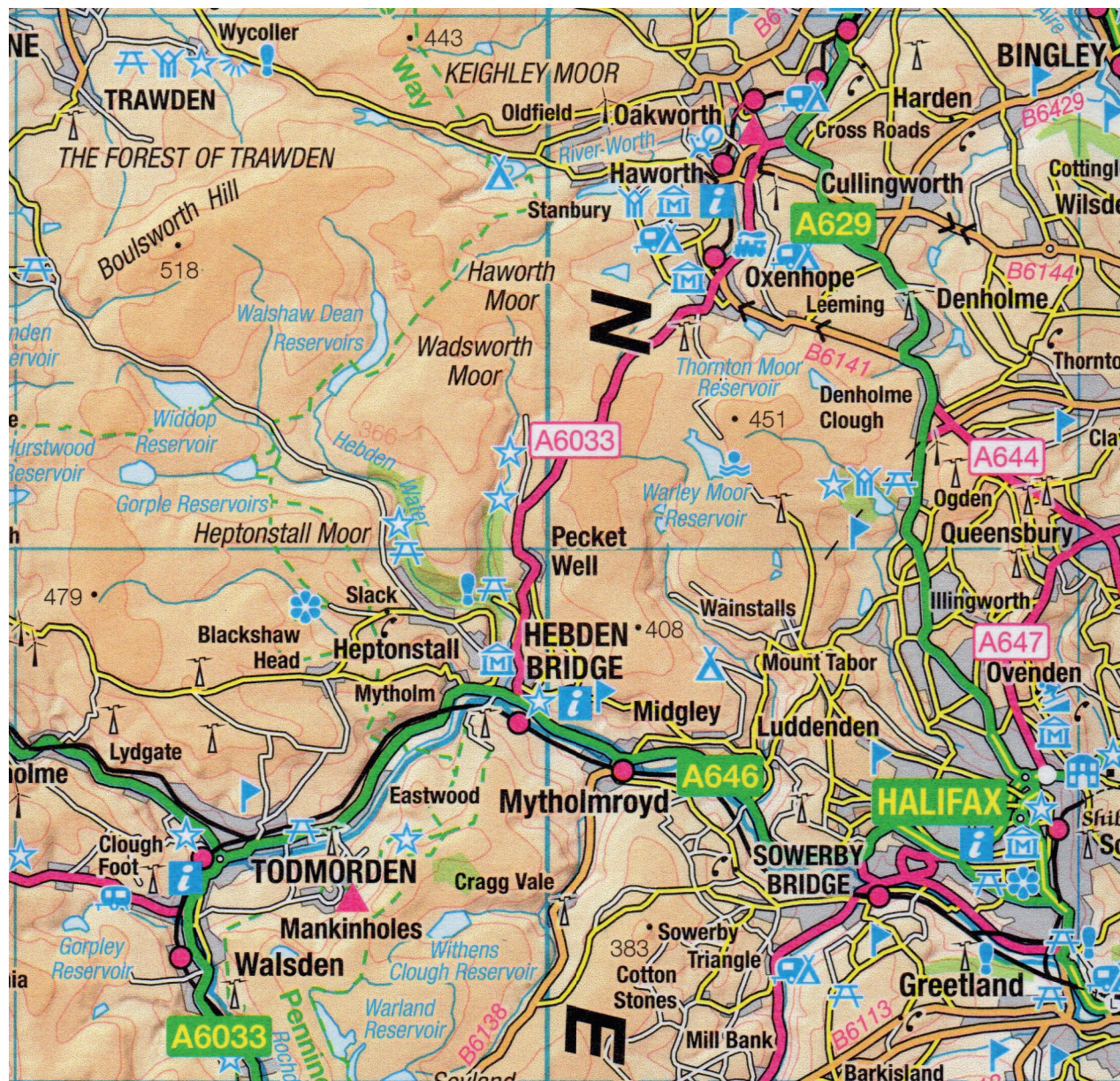


Sheetlines

The Journal of
THE CHARLES CLOSE SOCIETY
for the Study of Ordnance Survey Maps

Number 107

December 2016



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Published by
The Charles Close Society for the Study of Ordnance Survey Maps
www.charlesclosesociety.org

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Printed by Winfield Print & Design Ltd

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The British Library has a major exhibition *Maps and the 20th Century: Drawing the Line* running until 1 March. The Society has arranged a tour on 16 February (free of entry charge). Numbers are limited and booking is essential; to join, please contact Bernard Anderson, details opposite.

John King invites members to join him on 'A Central London cartographic meander', a walk visiting sites where old and unusual maps are on public display and also taking in some locations of cartographic relevance and pointing out some of the underground elements of the city not revealed on most maps. To keep numbers manageable, the walk will be held twice, on Saturday 4 March, repeated on Saturday 18 March, starting at Victoria Station at 10.30 and lasting about two hours. Contact Bernard Anderson stating which date you would prefer.

It is hoped to arrange a map-exploring expedition to Belgium / the Netherlands in Spring 2017 and anyone wishing to express an interest in this should contact Bernard Anderson. Further visits to archives, libraries and collections throughout Britain are being planned for later in the year. Details will be posted at www.charlesclosesociety.org/latest as well as being emailed to members (see below) and will appear in April *Sheetlines*.

Two versions of Ordnance Survey *Old Series* one-inch sheets 1 to 90 (south of Preston-Hull line) are now available for viewing on the Society website, selectable from an index map or by the *CCS Sheetfinder* interface. One version dates from 1830s, before the building of the railways, the other dated 1860s. Details at www.charlesclosesociety.org/oldseries. In addition, thanks to the efforts of Chris Fleet at National Library of Scotland, one-inch *Revised New Series (England and Wales)* maps are now available for viewing on *Sheetfinder* at www.charlesclosesociety.org/CCS-sheetfinder.

The Society regularly communicates with members by email. In some cases, emails are being bounced back as undeliverable due to erroneous address. If you have not been receiving our emails and wish to do so, please notify us at info@CharlesCloseSociety.org.

The 2017 AGM is in Lincoln on Saturday 13 May. Full details with April *Sheetlines*.



Steve Burry, Managing Director of Dennis Maps (left) welcomes CCS Chairman Gerry Zierler on the occasion of the Society visit (see page 38).

Is Britain on the move?

Mark Greaves¹

Australia has recently announced a 1.8m shift in its mapping coordinates, to compensate for the country's 7.5cm shift north each year. Inevitably the question is why, and could the same thing happen here?

In Australia, the shift is to take into account the growing difference between maps (and the coordinate reference system they're based on) and the system used by satellite positioning (GPS). It's a fact that the world is constantly shifting on tectonic plates, but maps (and their users) like fixed coordinates that don't change. Before GPS, this was simple to achieve as most positioning and mapping was created from fixed ground points in a coordinate reference system tuned to a particular country. In Great Britain our fixed points included the very familiar trig pillars and we have a mapping coordinate reference system called OSGB36 National Grid which is fitted closely to our little bit of the Earth. Tectonic plate movements had little or no impact on the mapping coordinates or fixed points because they all moved "as one" and generally stayed the same shape.

GPS is a global system and requires a coordinate reference system that has a good average fit to the whole Earth, and also has to change to keep up with the shifting of tectonic plates – it is effectively 4D (3D + time). The GPS coordinate reference system is WGS84 and is perfect for GPS, but perhaps not ideal for large- or mid-scale mapping because it moves (albeit slowly). Also for WGS84 the fixed point is not trig pillars on the ground, but satellites in orbit at approximately 20,000km and travelling at approximately 14,000kmph!

The differences between regional systems, such as OSGB36 and WGS84 means that GPS-derived coordinates have to go through a mathematical operation, known as a transformation, in order to fit them correctly on the map. Australia's mapping system was updated in 1994, and fixed to the ground at that time, to be directly compatible with WGS84. However time and tectonic plate movement have taken their toll, and the mapping system and WGS84 have now drifted apart to a level that might be noticeable to a wider group of users other than geodesists and geologists. Hence everything now being dragged 1.8m to the north!

So, what's the position (forgive the pun) in Great Britain?

The situation for us (and most of Europe) is not so bad. Europe's GPS compatible datum, ETRS89, is fixed to the European tectonic plate at the time 1 January 1989 and moves by around 2.5cm each year. In theory, GPS-derived coordinates are now about 70cm away from where they should be in the ETRS89 system.

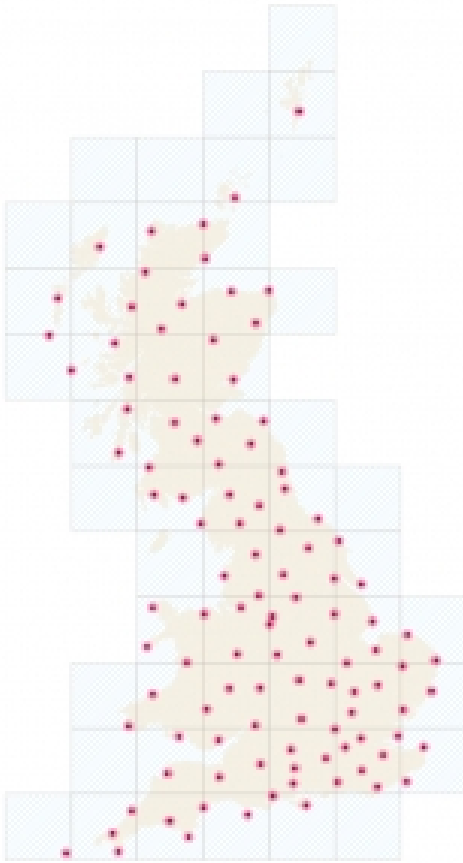
For most consumer users the 70cm difference is swamped by the accuracy limits of their receiver (phone, satnav etc) which are only accurate to within a few

¹ The author is Lead consultant - Geodesy at Ordnance Survey.

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<https://www.ordnancesurvey.co.uk/blog/author/mark-greaves/>

metres. So the difference is not noticeable if you're out walking, or driving around the country.



OS Net locations across Britain

For professional users, like OS surveyors, a correction service is used with the GPS to get centimetre-level accuracy. We use OS Net. This means they are automatically positioned in ETRS89 via the correction service so the 70cm drift is accounted for. A transformation is then used to get from ETRS89 to OSGB36 National Grid to be compatible with OS maps.

Clearly though, the problem of WGS84 drift relative to the mapping system is not unique to Australia and will eventually effect all countries. The drift happens at a constant rate but the increased use of GPS, plus other satellite positioning systems and the associated receivers becoming more accurate, means that the drift is likely to become more noticeable to more users.

What's the answer?

There are a number of options. Mapping in each country could stay on a "local" system such as OSGB36, then an additional transformation could be employed to first go from WGS84 to ETRS89 and then on to OSGB36. Or all mapping could be based on ETRS89 and simply keep the time evolving WGS84/ETRS89 transformation. Or, transform all mapping to a WGS84 compatible system (at a certain point in time) and have coordinate jumps every few decades to keep up with WGS84. This is not an ideal answer and it seems Australia are only doing this once before implementing another system in 2020.

An alternative might be to have a dynamic "4D" coordinate system that constantly evolves like WGS84 and users become used to all coordinates and map data having a time stamp plus the availability of a transformation to bring coordinates into a common time frame if so desired.

For now, Ordnance Survey, and other mapping agencies in Europe, are all planning for the future when this becomes an issue and will be considering, in consultation with users, the best way to deal with it.

Two interesting maps for 'OS225'

Richard Oliver



The 225th anniversary of the official foundation of the Ordnance Survey is being celebrated with far less fanfare than was the bicentenary in 1991: the main tangible souvenirs appear to be the two limited-edition maps that are the subject of the present comment.¹ Some background to the production of the maps is given by Christopher Wesson in *Maplines*, and this has been drawn on here.² Both are based on current OS digital data.

The map of London (*figure 1, above*), at 1:31,680 and filling most of a 1000 × 890 mm sheet of paper, is intended to be in early nineteenth century style, and superficially it appears to fit the bill. Yet which style? The original Ordnance Survey style was monochrome, based on engraving on copper, and is exemplified by a range of maps, from the set of four Old Series 1:63,360s covering Essex of 1805 to the 1:10,560s of northern Britain that were appearing fifty years later: yet here principal roads are infilled a pale sienna. Now it is true that copies of these and similar maps are often encountered so treated, yet this colouring was an unofficial addition. Hatched infill and south-and-east-side 'shading' of buildings is 'authentic', but there is no corresponding shading either of principal roads or of water: the line-gauge for the building-shading seems rather heavy anyway, and is accentuated by the lack of the other shading. Railways are shown by an approximation to the 'ladder' symbol adopted in 1836 or 1837 for the one-inch, supplemented by single-line-with-crossbars, but no earthworks or bridges are shown: the result lacks integration, and looks like the box-ticking addition of

¹ *Western Highlands (225 anniversary special)* and *London (225 anniversary special)*: these two titles can be ordered from os.uk/maps: they are £12.99 each, including dispatch costs.

² Christopher Wesson, '225 years of Ordnance Survey', *Maplines: The Magazine of the British Cartographic Society* 27(2) (Summer 2016), 16-17

railways to Old Series sheets in their dotage in the 1880s. The tree symbols have been traced from originals, and look well in parkland, but lack the density characteristic of early OS one-inch depiction of woodland: the feeling is far more that of 1930s practice. (Most of these traits can be seen in figure 1.) Churches are shown by crosses; at least two windmills appear (Brixton and Wimbledon Common), and though an ‘original’ style is claimed, this example (*figure 2*)



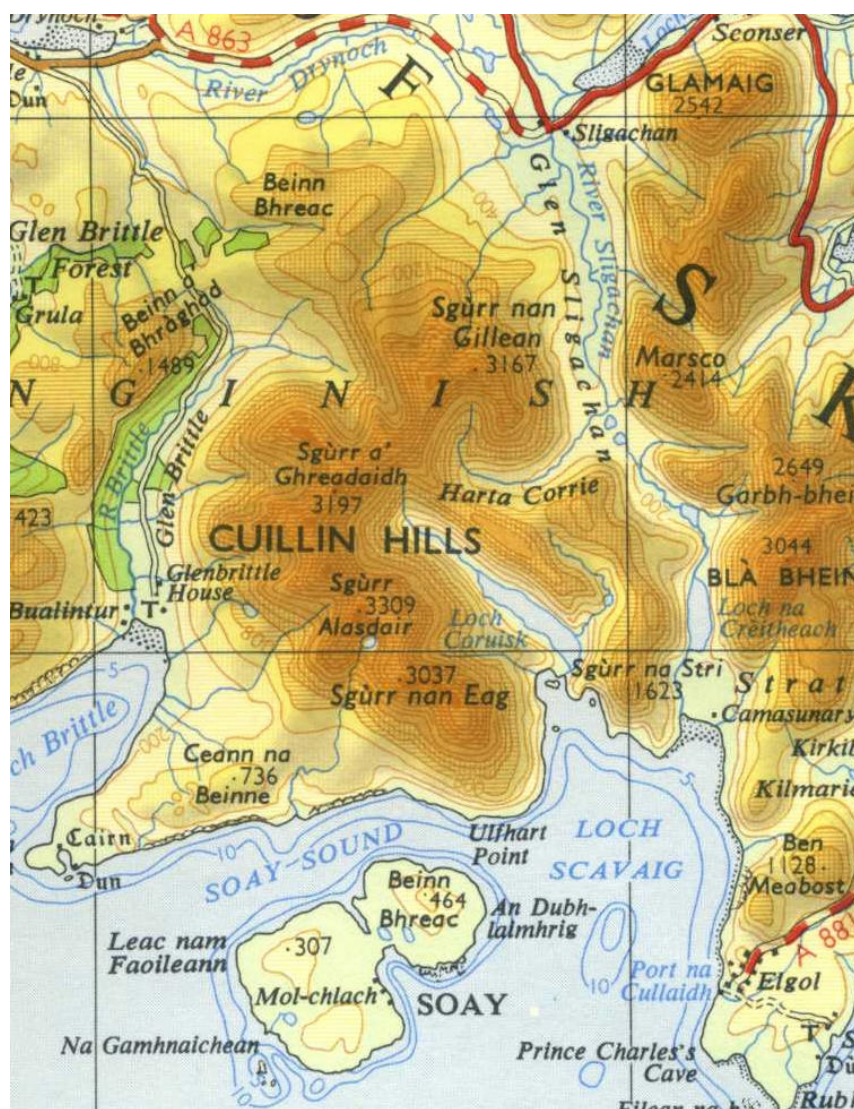
Figure 2 (far left). Windmill symbol at Wimbledon Common on London (2016).

Figure 3. Windmill symbol at Camberwell, from 1:63,360 Old Series sheet 7 (1822).

manages to look different even from the seemingly exhaustive range of designs used in the late 1830s.³ Whilst it is true that the OS made an attempt to distinguish tower and post mills, this was not original practice, before *circa* 1820, and standard OS practice from the 1880s to the 1970s was a ‘post-mill’ symbol (*figure 3*). The lettering is not wholly successful: it is neither a ‘modern’ style, of the sort used by the OS in the nineteenth century, nor an ‘old’ one used later, such as ‘Withycombe’ or Times. The treatment of names is open to question: why is Buckingham Palace treated as an ‘antiquity’? Why ‘The Regents Park’? (Old Series sheet 7 of 1822 has ‘Regents Park’, as today.) The scale is expressed as ‘Scale of Two Hands’: goodness knows why, as this is no recognised scale in any cartographic culture that I know of. What is wrong with ‘Two inches to a mile’?

The *West Highlands* map is intended to be a ‘replica’ of 1:250,000 Fifth Series sheet 4, edition B, of 1967: it is the work of Charley Glynn, which explains the ‘CG’ edition code bottom left. In many ways it is altogether more successful, partly no doubt because colour-printed hypsometrically-tinted maps are a familiar modern cartographic language. The most obvious difference between 1967 and 2016 is that the ‘replica’ uses a much heavier brown for the higher altitude tints: compare figures 4 and 5. However, ‘the devil is in the detail’, and this can be seen in comparing figures 6 and 7: notice on the ‘replica’ the sudden narrowing where the B8065 becomes ‘unclassified’, and the use of bold areas of stipple for buildings where the original has small individual black blocks. This is a relic of corner-cutting in digitising around 1989-90, not the analogue subtlety and graceful transition of twenty years earlier. The lettering of the ‘replica’ appears a good match for the original, until compared side by side: why, for example, have the island names been italicised? Nor is it clear why the paper seems to have artificial dirt on the margins.

³ Bill Bignell, *Mapping the windmill*, London: Charles Close Society, 2013, 71.



The coming of digital cartography has enabled alternative treatments of the same basic data to be readily explored, and anyone concerned with the possibilities of reimagination and revival of older styles will be interested in these two maps (A variation on this is relettering of analogue mapping: see Richard Oliver, 'A few notes on map lettering', *Sheetlines* 95, 33-42).

The London map is let down by a lack of thoroughness in researching the original style; the West Highlands map by some of the detail in the database. Nonetheless, I hope that someone from Ordnance Survey will 'try again' some time: faulty execution this time round should not preclude something more satisfactory in the future. Such restylings could be quite an interesting sideline, to say nothing of perhaps leading to redesigning of the main map series.

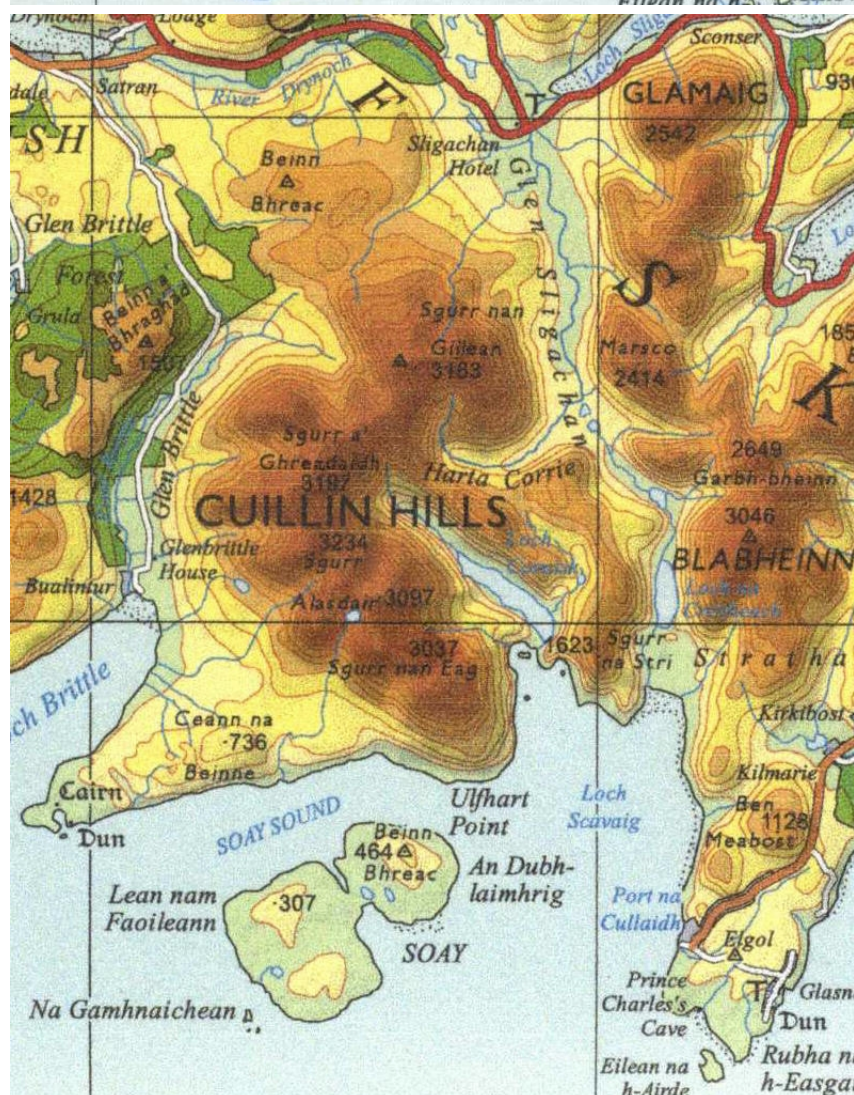


Figure 4 (upper):
The Cuillins, from 1:250,000
Fifth Series sheet 4, edition B
(1967).

Figure 5 (lower):
The Cuillins, from 1:250,000
Fifth Series sheet 4, version
'CG' (2016).

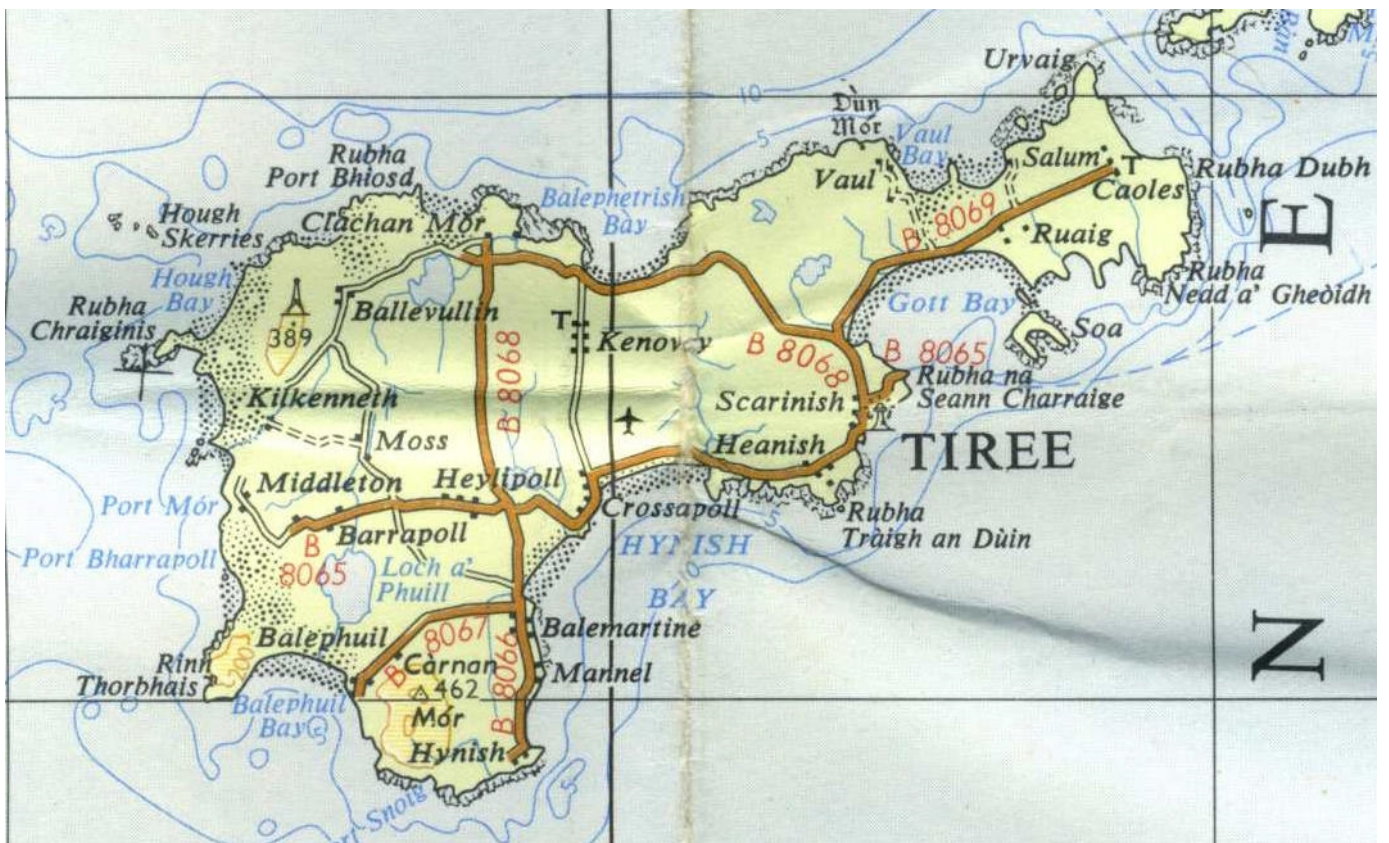


Figure 6 (upper): Tiree, from 1:250,000 Fifth Series sheet 4, edition B (1967).

Figure 7 (lower): Tiree, from 1:250,000 Fifth Series sheet 4, version 'CG' (2016).

Scotland in Roman times — a little speculation

David Archer

In the late 1940s, the Ordnance Survey might have received a letter seeking to purchase a copy of *Scotland in Roman Times*, and very possibly would have replied that copies cost 3/9d. This appears to be in conflict with previous writings on the subject.¹ ‘The stock of this map was destroyed by enemy action on 30 November 1940, just before publication, with the exception of about fifty copies which I had removed beforehand for safety. I am sending these copies to a few interested persons and institutions.’ So Crawford wrote in the covering note to the copies he sent out.²

Roger Hellyer gives more detail: ‘First, about thirty of the surviving fifty copies were distributed in 1940, by OGS Crawford to a few libraries and colleagues he considered deserving of copies.’³ Surviving maps certainly support this. I know of copies that came from Professors Grimes in Cardiff, St John in Cambridge and others from an archaeological background. All have been used, with the soft paper covers showing wear at the spines and edges. Thus, about thirty of fifty newly printed copies were distributed. So far, so good.

However, a couple of years ago I saw a near-mint copy with a purple rubber-stamped price change on the cover: ‘SALES-COPY / PRICE / THREE-SHILLINGS & NINE-PENCE’, is stamped over the original black ‘PRICE THREE SHILLINGS’. The middle line of the stamp, the purple word PRICE sits over the original price and is almost invisible. Thus, in a mixture of purple and black ink the bottom of the front cover reads: ‘SALES-COPY / PRICE THREE SHILLINGS / THREE-SHILLINGS & NINE-PENCE’. This state of the cover is illustrated on page 53 of *Map cover art*.

Might the twenty copies not distributed by Crawford have been retained and later offered for sale at a higher price?

Whilst looking through some material destined for the Charles Close Society Archives, I came across a heavily used office reference book, with both manuscript and typed entries, letters, copies of memos and so on, containing a wealth of miscellaneous Ordnance Survey information, including many references to map prices. Compilation appears to have started just after 1941, with additions to 1958, possibly by a Miss Reed or someone else who moved in quite senior circles within the Ordnance Survey and needed such information readily to hand.

¹ See Roger Hellyer, The archaeological and historical maps of the Ordnance Survey, *Cartographic Journal* Vol 26, no.2, December 1989, p111-133, especially p113. John Paddy Browne, *Map cover art*, page 53. Charles Close Society, Digital Images Collection, Image 207 at https://www.charlescloseociety.org/files/DigitalArchive/Roman_Britain.htm Proof copy of quarter-inch (1:253,440) *Scotland in Roman Times* (CCS 218B/55/4), shows the red overprint proof, plus notes by Roger Hellyer.

² Roger Hellyer, *Cartographic Journal* Vol 26. Note 21 reads: Recipients included universities at Oxford, Cambridge, Glasgow, Edinburgh and Aberdeen. Other copies are in the OSMRL and RCHME, probably the residue of his minute stock.

³ Roger Hellyer, ‘Scotland in Roman Times’, *Sheetlines* 46, 46.

Two separate handwritten entries concern *Scotland in Roman Times*:

- The Forth, Clyde & Tay 1/4" Roman Period.
Prepared 1939, Not published, 3/-, being reprinted, No date.
Copy in table drawer.

and

- Scotland in Roman Times. The Forth Clyde & Tay.
18/10/48. 150 M & F. only @ 3/9d. No letterpress.

I do not intend to comment on the titles used in these entries, as I agree with Roger Hellyer that *Scotland in Roman Times* should be used.⁴ I know of a few copies with the original 'PRICE THREE SHILLINGS', as in the first entry. All have 'PRICE (Flat & unmounted) 2/- Net.' on the map, and all show signs of use, some, a lot of use. All copies known with the stamped revised price have had the price details on the map crossed through in pencil.

I suggest there are three pieces of evidence for suggesting that the intention was to offer the map for sale:

1. The stamped revised price on the front covers, including the words 'SALES-COPY'.
2. The second entry in the book with a price of 3/9d echoes that of the stamped price.
3. The original price for flat and unmounted maps has been erased from maps with the revised price as they no longer existed.

What about the '150 M & F. only' in the second entry? I assume M & F to mean mounted and folded, a term used by the Ordnance Survey. The 'only' acknowledges the destruction of the flat sheets, hence the erased price on stamped copies. But 150? 150 copies available for sale? Might these refer to the reprint mentioned in the first entry? If so, why such a low print run, even for war time or immediately post-war? If 150 does mean copies available for sale, how many were in fact sold, given that they appear not to have been advertised? Pre-war, few people outside the OS would have known this map was being prepared, and after 1940 Crawford initially maintained that he had distributed the only copies saved, 'I am sending *these* copies' (my italics). So why would the few who knew of the map enquire whether sales copies existed, when they might have been the very people Crawford had favoured with copies? The accompanying note implied *all* had been distributed.

Further questions might be put.

1. Did Crawford remove considerably more than fifty copies, without acknowledging them?

Unlikely in my opinion, since on 19 August 1956, at home in Nursling, he inscribed a copy along the usual lines: 'November 30 1940 ... 50 copies which I rescued beforehand'.⁵ Sixteen years after the event he still maintains that only fifty

⁴ Roger Hellyer, 'Scotland in Roman Times', *Sheetlines* 46, 46.

⁵ From an inscription on an inside cover in a private collection: 'This map, printed in 1939/40,

copies were removed. Certainly the first copy I came across was owned by a man who had worked with Crawford at the Ordnance Survey. He told me that the maps were rare and that only a few copies existed. I was told his copy came from a handful within the archaeology department. Sale copies were never mentioned, nor large numbers of copies.

2. Did someone else remove copies of this map and not tell Crawford? If so, why did he never find out? Were they brought out and stamped 'SALES-COPY' only after he retired in 1946?

3. If 150 in the second entry means copies available for sale, how many were sold, how many remained unsold and what happened to them? I feel pretty sure that copies were available for purchase, if one knew of them, or failing that, Richard Oliver suggests 'the limited stock was at least readied for sale, possibly around the time of the price rise on 1/9/45'. No evidence has been seen that a stamped copy was ever sold. The copy I have with the revised price is in pristine condition and I understand came from a source in Southampton. I am sure it was never sold. Both Roger Hellyer and Tim Nicholson saw six copies in similar condition, with the revised price stamp in a drawer in the Record Map Library in the 1980s.

4. Why 'SALES-COPY' at the start of the revised price? My understanding is that 'SALES COPY' was only used on military maps offered to the public.⁶ Does this mean they were on sale during the war, as were one-inch War Revisions marked 'SALES COPY'?

5. Why 150? It could be an error, but fifty would be no better. Only twenty copies would fit the accepted wisdom. Does 150 seem a reasonable number per box? I have no details of OS store keeping along these lines, so hesitate to comment further, but each copy weighs just under 110gms, making 5.5kg for 50, which would easily fit into an A4 photocopy paper box. This seems rather small; I would have assumed the use of larger boxes, and agree with Roger Hellyer that Crawford probably removed a wodge of maps, rather than counting them.

6. In the first entry, does 'being reprinted' mean the printing materials were still available? If so, what happened to them? Another comment from Roger: 'If I gauge the mood of the OS immediately post-war correctly, I would have thought that SIRT would have been about the last map on their books of which they would have permitted any reprint'.

Why is there no letterpress with each map? Previously, the letterpress was a significant part of each archaeological map issued, but I believe a decision was taken to publish *Scotland in Roman Times* without a letterpress. None was

was ready for publication in November but the stock was destroyed by fire on the night of November 30 – December 1st 1940, except for 50 copies (of which this is one) which I rescued before hand (sic). O.G.S. Crawford. Nursling, August 19th 1956'.

⁶ 'Sales copies' were identified by either an overprint or a sticker, bottom right: this was 'calculated to prevent the soldiery offering their free issue for sale to the public'. Richard Oliver in Roger Hellyer and Richard Oliver, *Military maps: the one-inch series of Great Britain and Ireland*, page 35.

intended in the later stages of production, and 'No letterpress' in the second entry is purely confirmation of this, rather than stating an intended letterpress is absent.

The first, and most compelling argument for this is that Crawford wrote that the map 'was *ready* for publication in November'⁷ (my italics). Ready without a letterpress. Crawford never mentioned its absence, nor did he suggest the maps sent out were incomplete. When he sent a security copy with an earlier red overprint to Professor EA Hooton at the Peabody Museum, Harvard he did not include a draft letterpress nor mention it being prepared.⁸

Secondly, this is confirmed by the scoring for folds to produce the spine being the exact width of the folded map, with no allowance for any letterpress. Earlier archaeological maps had usually been issued with map pasted on to the inside of the rear cover, about 6mm forward of the 'rear scoring' for the spine. *Scotland in Roman Times* is pasted flush to this line, with the two spine scorings the exact width of the folded map. Were a letterpress to be pasted on the inside front cover, the spine would be too narrow, causing the right vertical edge of the front cover to pull away leftwards.

Thirdly, the original 1939 price of Three shillings would have been very low for an archaeological map with letterpress. In 1932, *Neolithic Wessex*, cloth backed with a 35-page letterpress cost Four shillings, whilst the 1938 *Dark Ages (North)*, paper with a 43-page letterpress also cost Four shillings, and cloth backed cost Five shillings.

Speculation as to why it was decided not to have a letterpress is probably pointless.

Maybe resources were focused on more pressing matters in 1939/40? Or was it decided to issue the map as soon as possible, and subsequently issue a text, possibly one for the whole projected series? I am surprised that Crawford never drew attention to the absence, when he might also have given a reason. Instead he says the stock was destroyed 'just before publication', and 'was ready for publication'. Not 'In the final stages of production' or 'before the letterpress was added'. Surely, if the map was incomplete he would have regretted and noted the fact?

Finally, we might speculate on *Overprinted 1939* which is the nearest we get to a publication date on this map. Supposedly printed in 1939, stocks were destroyed at the end of November 1940, almost a year later, possibly longer. In his letter to Hooton of 25 May 1940, Crawford writes:

1. '... on the published edition it *will* be in black'. (my italics).
2. 'this red overprint appears to be the only available copy'.

Surely, this suggests that the black version, though dated 1939, had not been printed by May 1940, as only a single copy of the red version could be found for Hooton. But why was the date of overprinting not changed to 1940, whilst the archaeological detail for the black plate was being changed?

I know of 19 copies of this map, some with and some without the revised

⁷ See footnote 5 above.

⁸ Roger Hellyer, *Cartographic Journal*. Vol 26, no.2, December 1989, p119.

price, and believe the time has come to try and record the total number of copies that have survived, and of these, how many have the revised price stamp. If numbers reported are significantly beyond fifty and twenty respectively, the accepted story of this map will have to be re-considered.

Perhaps members holding copies or knowing where copies reside could contact me,⁹ in confidence at david@david-archer-maps.co.uk or David Archer, The Pentre, Kerry, Newtown, Montgomeryshire, SY16 4PD.

For this piece, I have unashamedly plundered Roger Hellyer's work and used suggestions from email discussions, for which I am even deeper in debt to him than usual. Thanks are also due to all who have shared thoughts and supplied information over the years, especially Chris Bull, Richard Oliver, Richard Porter, Rufus Sweetman and Rob Wheeler.



Extract from proof copy of Scotland in Roman Times with red overprint showing part of the Antonine Wall. From the CCS Digital Archive at www.charlesclosesociety.org/files/DigitalArchive/Roman_Britain.htm

An exhibition titled *The World in a Book: Hakluyt and Renaissance Discovery* celebrating the life and legacy of geographer Richard Hakluyt on the 400th anniversary of his death is at the Bodleian Library until 23 December. Hakluyt (1552-1616) was an influential writer and editor whose works promoted exploration, commerce and the colonization of North America. He is also considered to be the first to lecture in modern geography at the University of Oxford.

⁹ Plus known holdings of *Dark Ages (North)* 1938, 3000/38 which has an almost identical history, yet is ignored by most collectors. 'Before the outbreak of war, some 70 copies had been disposed of in various ways. The whole of the rest of the stock was destroyed in November, 1940 at London Road'. CW Phillips, *Cartographic Journal* Vol 26, no.2, December 1989, page 119, footnote 68. These maps are not too uncommon, so it is always possible that Phillips was repeating incorrect hearsay from before his appointment.

Survey of Bicester Pioneer Square complex

Mick Upfield

Introduction

I was an Ordnance Survey (OS) surveyor with more than 39 years' experience. I started working for OS in April 1975 attending a nine-month basic surveyor training course. After that I increased my skills and knowledge through training and practice of graphic survey, air ground methods, Land Registry surveys and requisition replies, preparing Boundary Perambulation Cards in various office in West Wales and Southern England.

Prior to 1987 all survey work was drawn up on plastic Master Survey Documents but after 1987 survey work has been digitally captured and stored.

In 1996 I was introduced to a pen tablet to digitally capture simple line data in the field and this has now evolved into the data capture of today where line work is structured to form polygonised data that is attributed to reflect real world form and function.

I have seen survey instrumentation and capture methods evolve in that time too. I used to work in a team with two or three colleagues using Electronic Distance Measuring (EDM) that measured a laser beam reflected by a prism but due to manpower cuts and better more sophisticated equipment I tended to work alone measuring from stations controlled by GNSS (Global Navigation Satellite System) and surveying using Remote Electronic Distance Measurers (REDM) which measure signals reflected off features. Although instrumentation and methods may have changed and is less labour intensive the theory is still the same. I still worked from a framework of known survey points to capture new detail. I also used GNSS for surveying new detail but often had to use a combination of methods due to limitations of that method when satellite signals were obstructed by tall buildings and trees.

I was responsible for updating the geographic OS MasterMap area covering Cherwell and parts of South Oxfordshire to OS specification as well as maintaining the associated layers of Address, Integrated Transport Network and Small Scales Intelligence Data to business defined timescales. I also attended to customer queries and responded to Land Registry survey requests.

I was a trainer and in that role I instructed in the use of the pen-tablet and how to incorporate the survey instrumentation to collect points and features and attribute them to current OS Specification. I wrote best practice sessions delivering to groups of surveyors highlighting specification changes and introduction of new equipment and software.

I was often involved in testing new software, hardware and processes feeding back findings to management verbally and in written form.

This case study describes a survey in June and July 2013 of Pioneer Square, Bicester which is a town centre complex consisting of a Sainsbury supermarket, a VUE cinema and a multi-storey car park along with other smaller retail outlets. For the survey I used GNSS, REDM and Graphic skills to update the OS mapping database. In the case study I demonstrate my competence in Mapping and

Measurement of Land and Property, surveying the site and attributing the line work and polygons to reflect real-world form and function and delivering that data to the current OS Specification.

Planning the survey

In June 2013 I accessed the Geomedia based planning tool known in OS as the Job Planning Client (JPC) navigating to the relevant survey job for Pioneer Square. Noting that it was due for survey I made a site visit. I contacted the site manager who informed me the first phase would be opening late July 2013. On site I confirmed that the footprint of data indicated in JPC covered the whole site. I ruled out using Remote Sensing due to time scales and the need for follow up ground completion, as many features would not be visible from the air due to overhanging rooflines. I decided to survey the site using a combination of GNSS, REDM and Graphic Survey methods for the following reasons;

- GNSS for picking up control stations, new roads and pavements as it was much the quicker method of capturing features of this type to the relevant accuracy standards than REDM and Graphic Survey methods. However, I could not use GNSS for all points and features as the buildings at Pioneer Square were tall and close together raising the possibilities of multipath errors. These occur when satellite signals reflect or bounce off surfaces, increasing the distance they travel to the GNSS Receiver resulting in positional inaccuracies.
- REDM from GNSS positioned stations to pick up all relevant observable points on buildings, fences and posts. The shapes of the buildings are irregular comprising of angled and curved outer walls with juts and recess making well-sited REDM capture ideal given the limitations of GNSS and Graphic capture. REDM would also keep me off the roadways avoiding site traffic.
- Graphic Survey to complete the infill survey of features using short taped lines tying out to points and features captured by the other two methods.

While on site I noted the position for the REDM control stations but did not mark them on the ground as the site was still active and the position could be obstructed when I returned to carry out the survey.

Back in the office I updated the footprint of data I required using the raster back drop on JPC to reference it to local exiting detail.

Accessing the data

During the second week of July 2013 I accessed Job Explorer (JE), an ARC10 GIS software based tool that connects online to JPC, to extract the job item onto my pen tablet. JE is also used online to load the data into another ARC10 based tool, Object Editor (OE). OE is used to record the captured data on site

The survey control framework

I returned to the site and contacted the site manager who informed me that contractors were still actively using plant on site. I assured him I would continually assess risks and mitigate them by wearing the appropriate PPE and avoiding scaffolding and moving plant.

I use OE to load the data into a format to enable the capture of survey lines and to attribute them reflecting real world “form and function” as laid down in the Data Capture and Edit Guide (DCEG).

Once I had the data loaded on to OE I checked the accuracy region of the data by toggling the relevant button and confirmed that it had a relative accuracy of ± 0.42 metres root mean square error (RMSE). This means that all new points I captured should fall within 0.2m of existing detail and that any point under 0.4m would not need action to address the inaccuracy.

I set the tolerances on the GNSS ensuring I had a good RTK fix with a Geometric Dilution of Precision (GDOP) of 3 or less. This meant that I was receiving signals from a spread of satellites with good geometry enabling an acceptable level of accuracy for the captured survey points.

I walked the site and ground marked the positions of my REDM control stations ensuring where possible they were visible from at least two other stations to ensure accuracy. I also deleted demolished features from the map data.

The Survey

Using GNSS I measured local points of existing survey detail around the site to both check that the existing data fell within the acceptable OS tolerance for 0.42m accuracy regions and that the GNSS equipment was correctly capturing position in sympathy with the exiting data and without major errors that may result from, for example, equipment malfunction or multipath. The urban extent of Bicester was re-surveyed in late 1990s and my experience from previous survey tasks in the town had always confirmed the accuracy in Bicester to be within that laid down in OS Guidelines for a 0.42m specification region.

The results from checking the points around the site proved the same, but if any had fallen outside tolerance I would have made further accuracy checks radiating out from the site picking up and comparing additional old detail points until I had confidence that the original survey was within tolerance. I would adjust as little old detail necessary to retain geometric, relative and if possible absolute accuracies as moving old detail could have an impact on customers holding that data. Examples of geometric fidelity and generalisation on site can be seen in the following two photographs with the position and direction taken indicated on *Screenshot 1* by red arrows.



Screenshot 1



Photo 1



Photo 2

Comparing *Photo 1* with *Screenshot 1* shows that parallel features have retained their shape and *Photo 2* shows the real world gap between the trolley-shelter and wall is centimetres and in *Screenshot 1* that I have generalised the mapping to show just the trolley-shelter. Despite modern survey methods allowing more accurate data I generalised features conforming to OS specification rules. The rules are based on cartographic reasons and producing a consistent supply of data for customers.

I commenced picking up REDM Stations positions as well as ground features such as road casement and path edges and the old points of detail, taking care to level the GNSS pole, checking GDOP and avoiding using GNSS near buildings to reduce the chance of multipath errors.

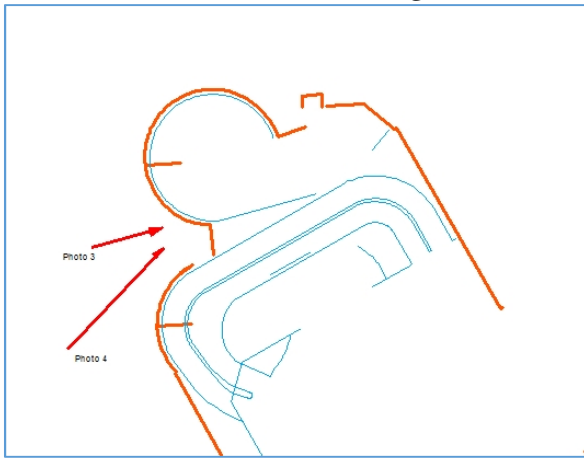
To capture survey features using a calibrated Leica T106 REDM (T106) I needed to know station setup coordinates and the bearing to which I was measuring the distance. To do this I set up the T106 ensuring it was level and vertically above the initial station and observed to a known point of old detail that I had checked for accuracy earlier with the GNSS receiver on my recce. To check that the instrument was functioning correctly and to alleviate any observer error I took measurements to old points of detail and checked that they fell in the correct position. This proved the setup was correct.

I picked up points on building outlines, fencing etc. and also measured to the other visible stations around the site. At the end of each round of station observations I repeated the check measurement to relevant independent points to ensure the setup had not moved.

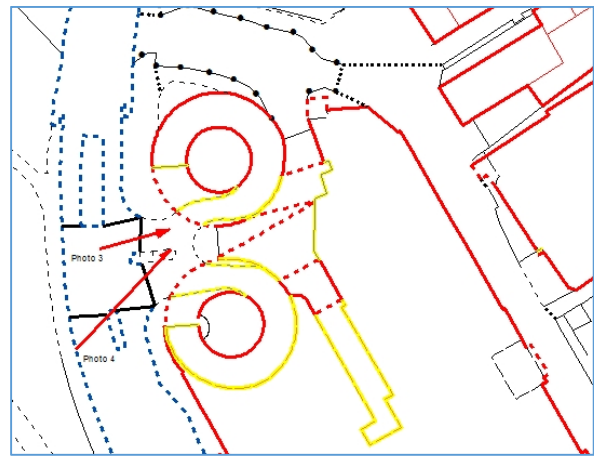
When I had completed observations at all station set-ups I was left with a framework of controlled surveyed points and features that I then completed using graphic methods. I used a tape measure, Leica Disto and optical square to run short survey lines between known points checking that the measured distances are within tolerance to the distance as depicted in the data and equating any errors over the length of the line. I took check measurements when convenient to

old detail to confirm accuracy and geometric fidelity. I also saved my work regularly to avoid losing data.

Due of the complexity of the site I needed to confirm that captured detail conformed to OS Specification as laid down in the DCEG. One example was to look up the depiction of spiral access ramps to the higher levels of the multi-storey car park (*Photos 3 and 4*). I had surveyed line work associated with the ramps using the REDM (*Screenshot 2*) and graphically in-filled the area but needed clarification about how to show it to current specification. The rules suggested it should be shown as depicted in *Screenshot 3*, i.e. with the different colours and line styles representing different feature codes such as solid building outline and overhead building outline



Screenshot 2



Screenshot 3



Photo 3

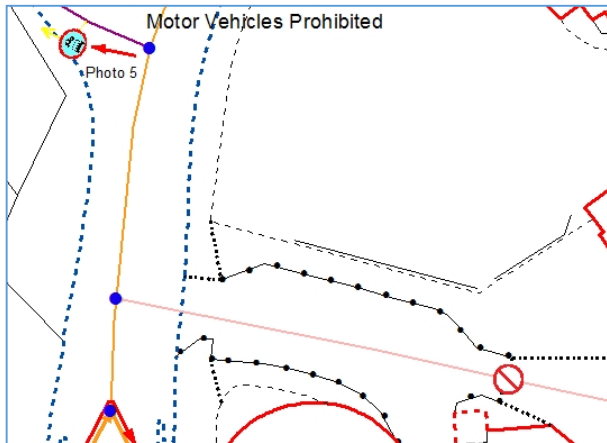


Photo 4

It was at this stage I identified lines and areas that need to be obscured. These are features that fall under the roof line but are still shown in OS data. In Pioneer Square these included walls, paths and posts.

As well as capturing survey data I updated the Integrated Transport Network and Address layers that are part of the intelligent mapping product OS MasterMap. In the Integrated Transport Network layer, I added the alignment of roadways indicating by attribution that they had restricted access and were not publicly maintained. I collected the position of rising bollards, gates, turns and height width restrictions, one way systems, as well as classifying roads. Where

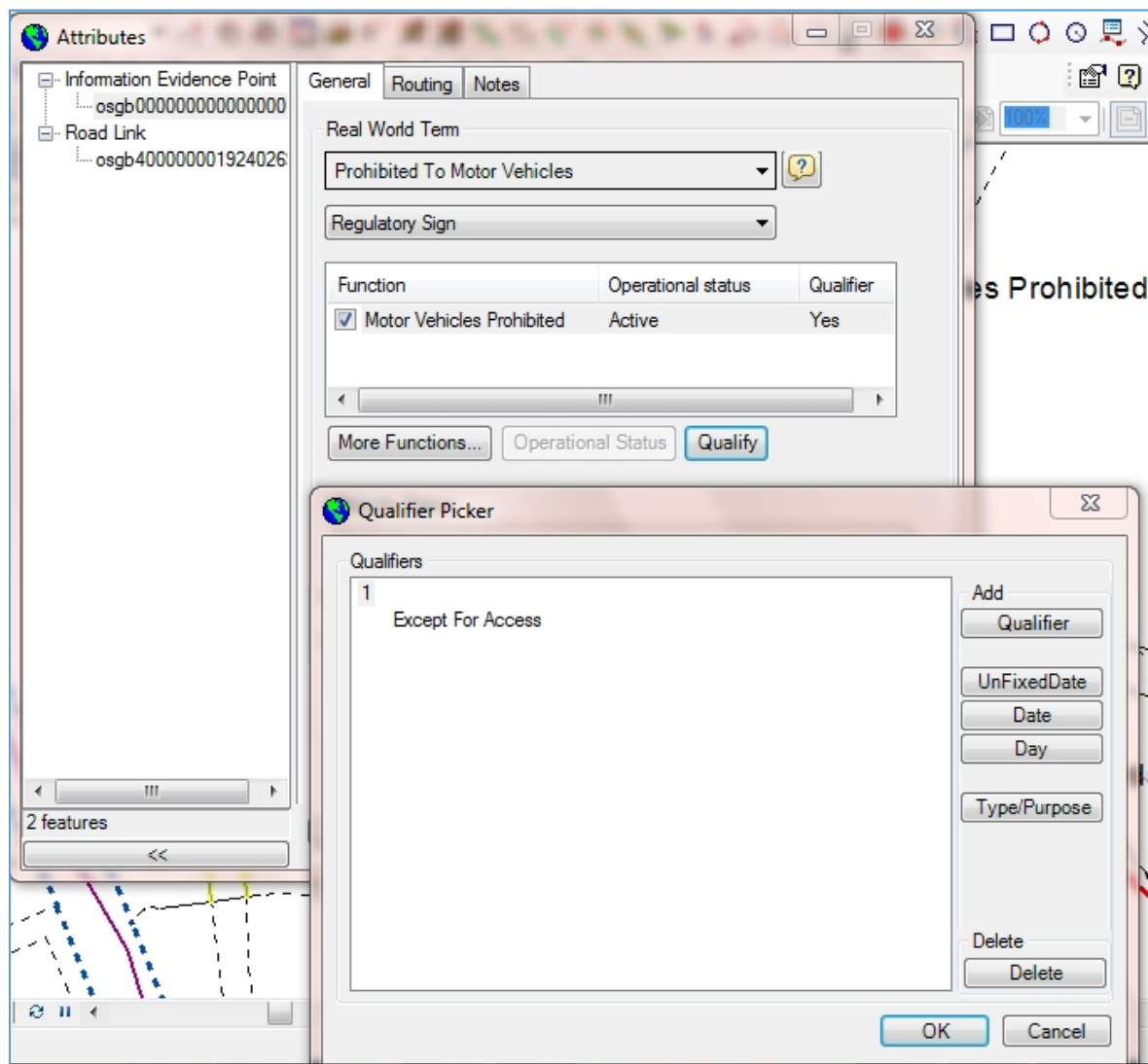
signage described restrictions and qualifiers such as time, type and purpose I collected those too. *Screenshots 4 and 5* show how I attributed a vehicle prohibition in OE and the resultant data of the sign in *Photo 5*.



Screenshot 4



Photo 5



Screenshot 5

Validation

Once satisfied that I had fully completed the survey and it was to specification, I ran the validation routine to structure lines and build polygons. This routine enabled closed polygons to be attributed and eliminated polygon bleeds polluting the data. Once this was completed and I had fixed all of the discrepancies indicated by the process I attributed the lines and polygons to reflect real world form and function such as edge of public roads and roofed structures made sealed surfaces and the like. I ran a final discrepancy check ensuring the appropriate attributed line work encloses each polygon and discrepancies had been resolved

I matched the outstanding addresses from the Postal Address File (PAF), to the appropriate Functional Site. A Functional Sites describes the main activity that occurs at a particular location and also holds proper name information including the evidence of how the name was collected.

I also updated Small Scales Tourist information for the car park which will be used on OS paper, digital and web based mapping products and services.

Before returning the data I ensured the routing layer was correct by toggling layers on OE to visually inspect the data and confirm road links and nodes had the correct attribution and that names were linked to the correct road link. I also confirmed that I had matched unmatched addresses and improved all the estimated positions possible in the editable area by checking the address file. It is important that all integrated products are updated and are compliant to OS Specification as customers depend on it for their requirements. Once satisfied I ran the job completion validation routine.

I submitted the job back onto the OS large-scale database, MAIA, through JE, where it went through further validation ensuring the job conforms to OS specification to supply to customers.

The result

Using change intelligence data in an off the shelf GIS Package I was able to plan and allocate my workload to complete the task. I was tasked to survey all new developments within six months of completion and I achieved this in Pioneer Square by updating the topographic mapping data to current agreed accuracies and specification. I also improved the address layer, drive restriction Information and small scales data making all data available to customers within agreed timescales and Service Level Agreements.

Limekilns – still a burning issue

Doug Mitchell and Paul Bishop

The mapping of limekilns in Scotland, on which we have reported before in *Sheetlines*,¹ is now part of Doug Mitchell's PhD project funded by the Arts and Humanities Research Council through Historic Environment Scotland (HES). HES was formed recently by the merger of Historic Scotland and the Royal Commission on the Ancient and Historic Monuments of Scotland (RCAHMS). We continue to find more symbols for limekilns, which yield interesting insights into the technology of lime burning, and the *Sheetlines* editor has encouraged us to provide this update so as to keep the record of OS mapping of limekilns in Scotland complete.

The symbols we report here are intriguing and have not hitherto been encountered in our working on the complete six-inch first edition coverage of Scotland. Figure 1 shows the six-inch mapping of Whitefield Quarry and limekilns, the latter's function being unclear except for the associated labelling. Our initial thought was that the reasonably common mapping of some U-shaped clamp kilns as closed rectangles (e.g., symbol 3a in Bishop and Thomson's figure 3; see also their figures 5B and 5C)² meant that the symbol might represent very narrow U-shaped clamp kilns. However, the wall shading confirms that the symbols represent narrow upstanding rectangular structures, as confirmed by the ridges that are clear in figure 2.

We have concluded that these kilns are a form of the common U-shaped clamp kiln pit, as described and illustrated in the earlier *Sheetlines* pieces on limekilns,³ but open at both ends. The limestone was apparently quarried at the quarry faces to the east of the kilns (the scarp in the upper part of figure 2) and would have presumably been loaded with coal into the kiln 'troughs' from the troughs' most accessible ends (from the east in the case of the four northern troughs in figure 1). Unloading of those four kilns would have been from the west, where the tracks that led out of the lime works are located (*figs 1 and 2*). This ease of loading and unloading probably explains the open-ended morphology.

On the basis of the lime works and limekilns not being described as 'Old' or 'Disused' we conclude that they were operating in the mid-nineteenth century when surveying for the first edition was undertaken. More kilns of this kind were found on the ground than were recorded on the first edition six-inch or 25-inch maps (compare figures 1 and 2). This difference might suggest that clamp burning continued to expand at the site following OS survey for the first edition, before eventually ceasing, but it must also be remembered that, as elsewhere, OS surveyors might have mapped fewer kilns than were actually operating.⁴ There are no kilns or lime works mapped or labelled at this spot on the second edition 25-inch maps, with the locality being simply labelled as 'Whitfield [sic] Quarry'. About 700 m to the north of this quarry, the Whitfield Lime Works is mapped on the 25-inch second

¹ *Sheetlines* 98,19-31, 101,42-47, 106,32-33.

² *Sheetlines* 98,19-31.

³ e.g., *Sheetlines* 98,19-31 figure 1.

⁴ Bishop and Thomson, *Sheetlines* 98,19-31.

edition (*figure 3*). Here the limestone, from adjacent quarries, was being burned in two draw kilns (*figure 4*) that are mapped with the symbol that represents the footprint of the kiln masonry enclosing two circular kiln pots (labelled “Kilns” in *figure 3*), along with the narrow ridge (track) leading to the loading area at the top of the pots (*figure 3*). The 1908 edition of the 25-inch mapping (revised 1906; published 1908) shows that the lime works had by then become defunct (‘Disused’).



Figure 1.

OS first edition six-inch mapping of limekilns at the Whitefield Limestone Quarry and lime works (Peebles-shire Sheet 5; surveyed 1856; published 1858). Wall shading confirms that the rectangular structures labelled ‘Limekilns’ are small upstanding ridges. The much more common U-symbol for a clamp limekiln is given in the lower centre of the extract. The 25-inch first edition mapping of the kilns does not include wall-shading, representing the ridges as narrow rectangles.

[extract reproduced by permission of National Library of Scotland]

Figure 2.

Part of the Canmore oblique aerial view of the Whitefield Quarry and lime works from the west, showing, at centre, the four northernmost linear ridges, mapped as narrow wall-shaded rectangles in figure 1. The southernmost (right-hand) of the four ridges at centre has apparently been consolidated into adjacent spoil material. At upper right, in front of the steep scarp, are the two linear ridges at upper centre of figure 1. Note the unmapped ridge at upper centre, to the east of the four mapped ridges.

(Canmore ID 159789; Crown Copyright: Historic Environment Scotland)

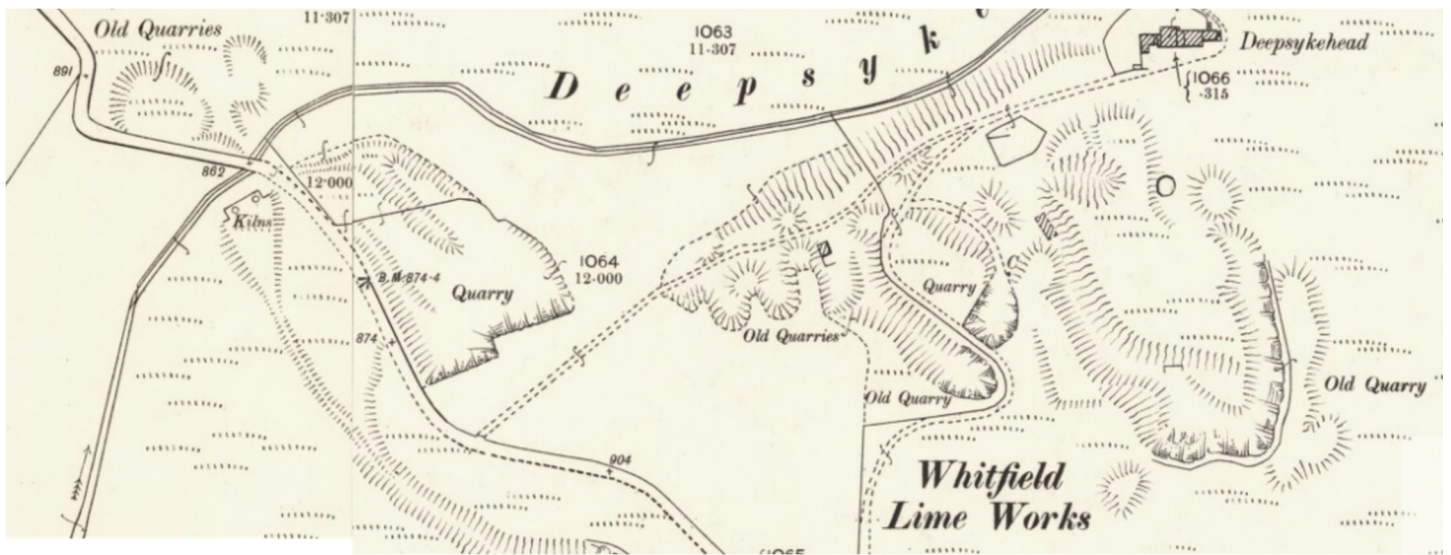


Figure 3.

OS second edition 25-inch mapping of limekilns at the Whitfield Lime Works (Peebles-shire Sheets 5.02 [left part; revised 1897/98; published 1898] and 5.03 [right part; revised 1898; published 1898]).

[extract reproduced by permission of National Library of Scotland]



Figure 4.

The draw kilns at the Whitfield Lime Works from the north, showing the draw holes at the bases of the two kilns pots. An earlier image of these kilns in the Historic Environment Scotland (formerly RCAHMS) Canmore database (Rutherford Mains, Limekilns; Canmore site ID 50215) shows that there was a draw hole on the eastern (left-hand) face of the kiln (now collapsed) and there could equally have been a fourth draw-hole on the western (right-hand) face, of which there now appears to be no evidence.



OGS Crawford's annotated maps

Bill Perry¹

Volunteers in the Wiltshire Archaeological and Natural History Society's Archive and Library have been working for some time on entering the Society's map collection onto the computerised catalogue. They have recently turned their attention to a collection of six-inch Ordnance Survey maps of Wiltshire annotated by OGS Crawford (1886–1957) with details of archaeological features and finds, and locations referred to in Anglo-Saxon charters and medieval documents. How these maps came to be in the Society's collection is an interesting story.

Crawford (*above, photographed in 1912*) studied geography at university, and from this he developed an interest in archaeology, taking part in excavations in the Sudan. He subsequently served as an RFC observer in World War I,² and came to realise the potential of aerial photography in identifying archaeological remains when he later saw RAF photographs of Celtic fields in Hampshire, and became one of the pioneers of the use of this technique. He teamed up with Alexander Keiller (heir to the family marmalade business and well known for his excavations and restoration of the stone circle at Avebury), who was a pilot and could afford to pay the bills, to photograph large areas of southern England from the air.^{3 4}

In 1920 Crawford was appointed the first Archaeology Officer of the Ordnance Survey, a post he continued to hold until after World War II. During the war he realised that the Ordnance Survey's then premises in Southampton were highly vulnerable to air attack and urged that original maps and records should be moved to a place of safety for the duration of the war, as was being done with important museum and art collections. However, he was unable to persuade the Ordnance Survey's Director-General to agree to this. Crawford, who had a reputation for being a somewhat irascible personality, then promptly took all 'his' maps to his home in Nursling, a village some four miles north of Southampton, where he stored them in his garage. His premonition about possible air attack was soon realised; the Ordnance Survey building and almost all its contents were destroyed in a major air-raid on Southampton less than twelve months later.⁵

Following his retirement Crawford kept his collection of annotated maps and on

¹ The author is a trustee of Wiltshire Museum, Devizes. This article first appeared in *Wiltshire Archaeological & Natural History Magazine*, vol 109 (2016) and we are grateful to the author and the Society for permission to reproduce it. The author can be contacted at bill.perry@wiltshiremuseum.org.uk.

² OGS Crawford, *Said and Done: the Autobiography of an Archaeologist*. London: Weidenfeld and Nicholson, 1955.

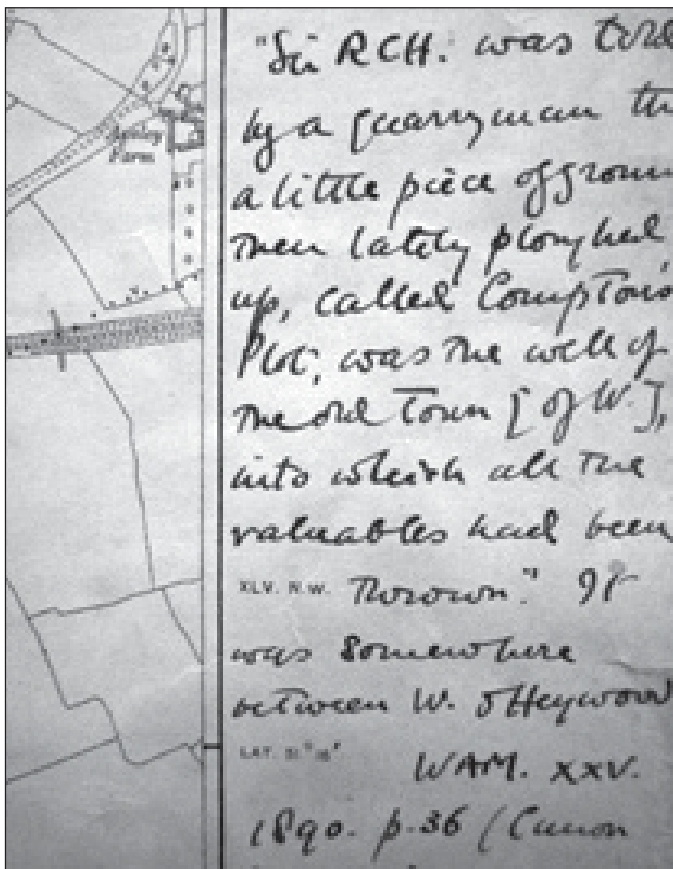
³ OGS Crawford. and A Keiller, *Wessex from the Air*. Oxford: Oxford University Press, 1928.

⁴ K Hauser, *Bloody Old Britain, OGS Crawford and the Archaeology of Modern Life*. London: Granta Books, 2008.

⁵ J Charlton, 'The Tale of Mr Crawford and his cap', *British Archaeology*, March 1999.

his death left the Wiltshire ones to the Society (it is not known where those of other counties went). Had he not taken them home in 1942 they would have been lost along with most of the pre-war records of the Ordnance Survey. While most of the sites he marked are now recorded on the County Sites and Monuments (or Historic Environment) Record, in many instances Crawford's annotations are more detailed, with references as to the source of the information; examples are shown below. Work on fully cataloguing this interesting collection of over 300 maps is almost complete and the full list, with descriptions of the areas they cover, will be available on the Wiltshire Museum website⁶ (Catalogue Nos. DZSWS: Map 320.1 onwards). Most of the archaeological books which Crawford wrote are also held in the Library together with a complete run of the journal *Antiquity* which he founded. Regrettably we do not have either the originals of his photographs or his personal papers. These went to his old university in Oxford where they are divided between the Bodleian Library (papers) and the Institute of Archaeology (photographs).

My thanks to Stella Maddock, Wendy Lansdown and Angi Britten who are working on the cataloguing of the Society's map collection and to Peter Saunders for helpful comments on a draft of this article.



Left:

Marginal note by Crawford on OS six-inch Wiltshire Sheet XLIV NE (1901 edition)

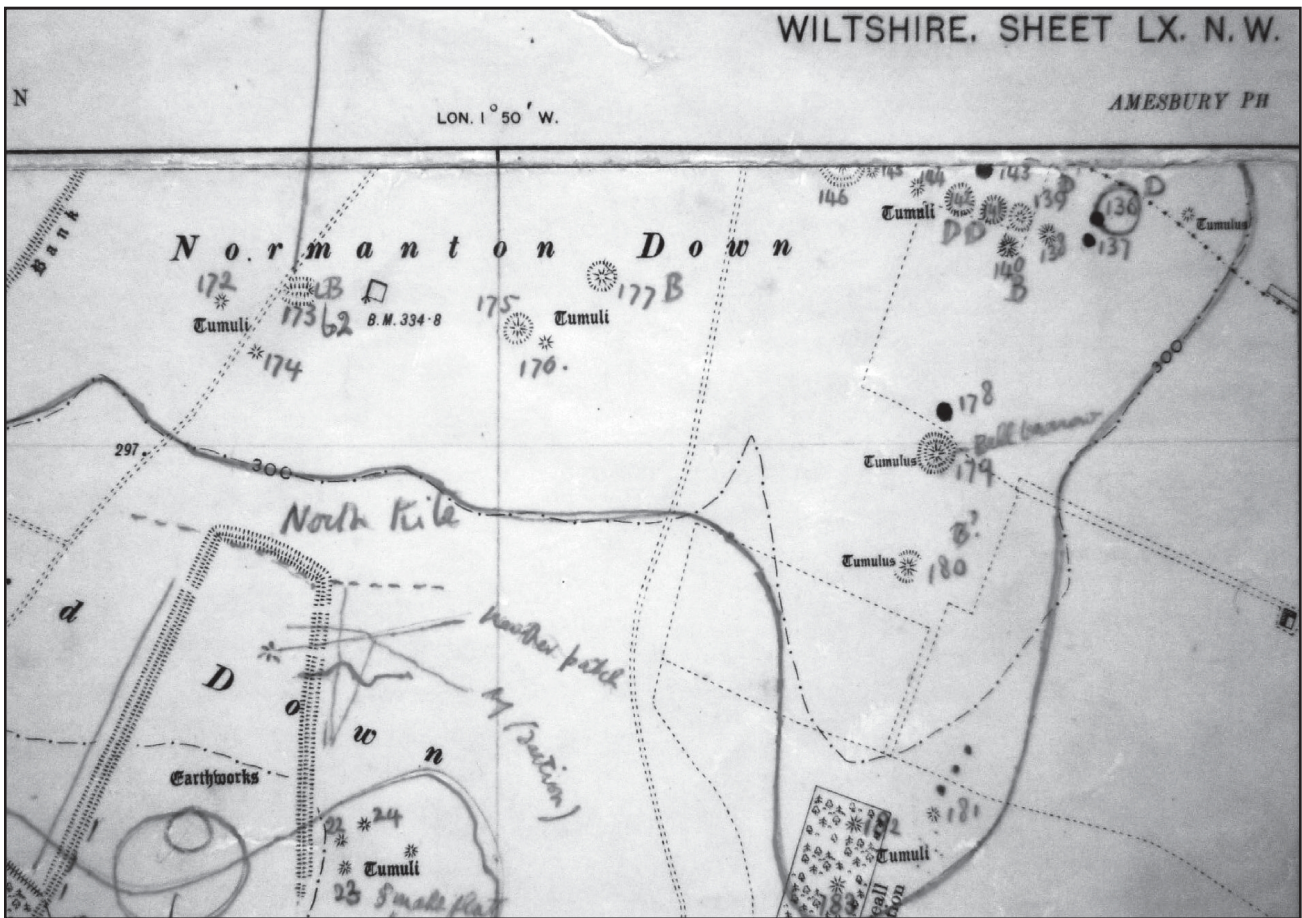
Opposite page upper:

Annotations on six-inch Wiltshire Sheet LX NW (1901 edition), Normanton Down

lower:

Annotations on six-inch Wiltshire Sheet LIV SW (2nd ed. 1901), Stonehenge

⁶ <http://www.wiltshiremuseum.org.uk/>



London stories

John King

London 2012 atlas

I recently purchased this intriguing atlas (*right*) from the stall of the London Transport Museum's Friends at Acton depot. To give the atlas its proper title, it is the *Bus Services Driver map book* most likely published in April 2012. It comes as an A3 landscape wire-bound atlas with the distinctive London 2012 magenta cover. It weighs in at an unwieldy 1½ kilograms.

The coverage is restricted to the main Olympic sites in London and Weymouth, including certain locations on the road network between the two areas as well as showing Heathrow, Gatwick and Stansted airports. Two key maps are provided, one of London and southern England and the other of London with a key map for the symbols used. Large scale maps are provided for the Olympic Park (1:8000), Heathrow Airport (1:3000) and the Media Hub in Bloomsbury (1:5000). There are a total of a further 178 coloured maps, of which 139 are of London, all at a scale of approximately 1:10,500. Only a scale bar is shown on the maps. The atlas does not give complete or consistent coverage of London but covers most of the central area.

The maps show the Core Olympic Route Network (ORN), alternative routes, off-ORN routes, venues, key buildings, hotels, road event cycling routes, bridge heights, loading zones, one-way streets, bus depots and TfL public bus route roads.

The mapping is clear and aesthetically pleasing being derived from the Ordnance Survey. Each map has Crown Copyright and database right 2011 with an OS Licence number shown in the bottom left hand corner.

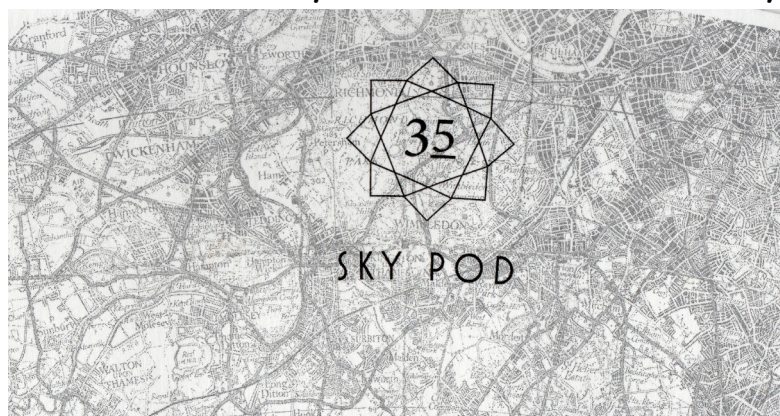
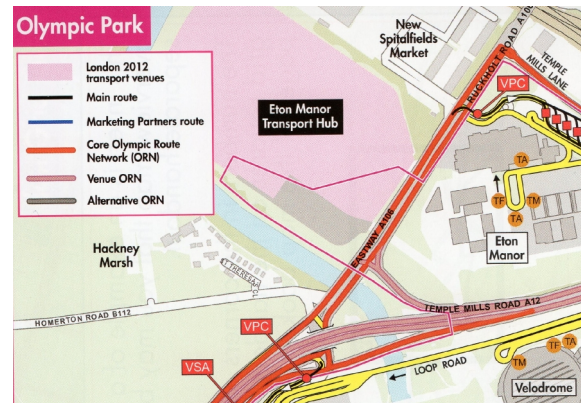
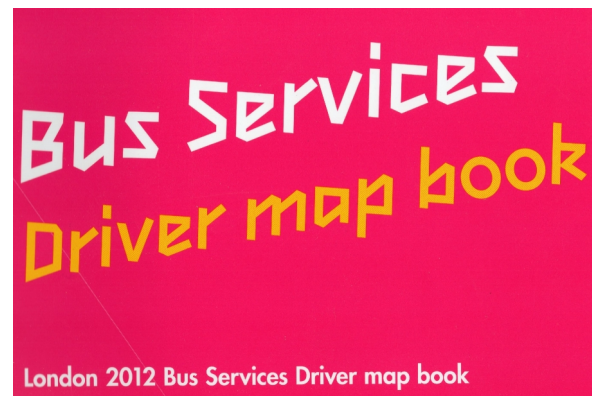
From the sponsors page at the rear it is clear that the atlas was also to be used for the Paralympic Games.

How bus drivers would have used this heavy and unwieldy atlas is not clear but the key symbols map states that the bus driver may be given a route overview map as a separate handout!

Coffee cup map

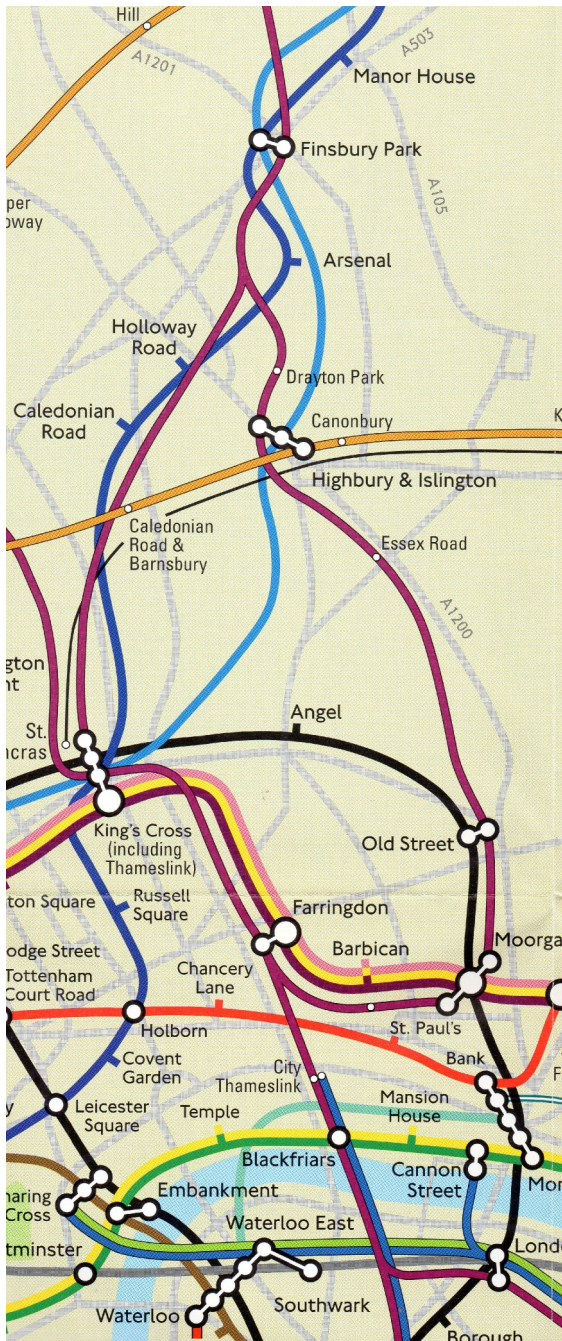
Earlier this year I made a visit to the Sky Garden at the top of 20 Fenchurch Street in the City of London. The building is more often known by its nickname, the Walkie-Talkie. The building, completed in 2014, is 38 storeys tall including three storeys of public gardens and is the fifth tallest building in the City of London.

The Sky Pod Bar on the 35th floor serves its coffee in cups (*left*) adorned



with a reproduction of an OS one-inch Popular map of south London stretching from Heathrow / Shepperton in the west to Deptford / Croydon in the east. The map is reproduced in grey and white at a scale of slightly smaller than 1:63,360 and appears to date from the 1920s but despite research I have not been able to pinpoint the precise date. Ironically the map does not cover the site of the Walkie-Talkie in the City. It places the Sky Pod logo over Richmond Park. The centre of the map is almost over my home in New Malden. Despite asking I have not been able to find out why this map was chosen.

I would recommend a visit to the Sky Garden. It is free but you do have to book online. If there are no slots for the Sky Garden book a table at the Sky Pod Bar (again free) to gain access to the garden and the views. The 360° view is brilliant on a clear day and you might be surprised by how long you spend up there. One observation I made looking down on the City was how many rooftop gardens there are. To my knowledge these are not shown on OS maps.



London Connections

Further to the comment in *Sheetlines* 106 (page 59) that no printed versions of the geographic *London Connections* maps were available, I do have in my collection four different versions, all being headed *London Underground*.

The first geographic *London Connections* route map is dated January 2007 (*left*) consisting of 14 panels folded double-sided. One side shows the whole of the London area whilst on the reverse is a larger-scale central area.

The second map is dated December 2009 consisting of 24 panels folded double-sided. One side shows the whole of London with a central area inset whilst the reverse has the standard Network diagram. Both these maps are in the larger format similar to the *London's Rail & Tube Services* map.

A further two maps are pocket sized (similar to the current tube folder) titled *Route Map*, one dated January 2007 and the other March 2008. They are both 14 panels folded double-sided geographic maps with one side showing the whole of the London area with the central area on the reverse. Despite the small size they are aesthetically attractive and readable being not dissimilar from the LT geographic maps produced between 1956 and 1972.

A further three maps of interest are the LU Operations Track Overview geographic maps. The first is dated March 2008 consisting of 14 panels

folded but only printed on one side. The second map has the same date but a pink cover and consisting of 30 panels folded single sided. The third similar map is dated November 2009.

All of the above maps were bought in auction as a job lot with very little interest being shown in them. Until the auction in 2014, I had not heard of or seen any of them. The Operations track overview maps are perhaps a logical internal product for LU but the three different formats for the *London Connections* perhaps make less sense. Were they trial maps? Despite my research I have not yet, been able to find a reason for their production.

Tube map mistake

The note in *Sheetlines* also mentions the new Tube map dated June 2016. It turns out that all the poster maps and pocket maps were printed with a mistake showing Morden, at the southern end of the Northern line, being in a Special Fares Zone (*below left*) instead of Zone 4 (*below right*).

The pocket maps were supposed to be issued on Friday 3 June but took some time to appear. However, it was only when I was alerted to the mistake that I looked carefully at the two copies I had picked up. Lo and behold one did have the mistake. I am aware that others also leaked out but it must have been hard for staff to distinguish between the two maps.

I had also seen one of the 'new' poster maps being removed at Euston but was not aware of the problem at the time.

What has happened to all the incorrect maps is unclear but presumably they have been pulped. For further information on the incorrect map see:

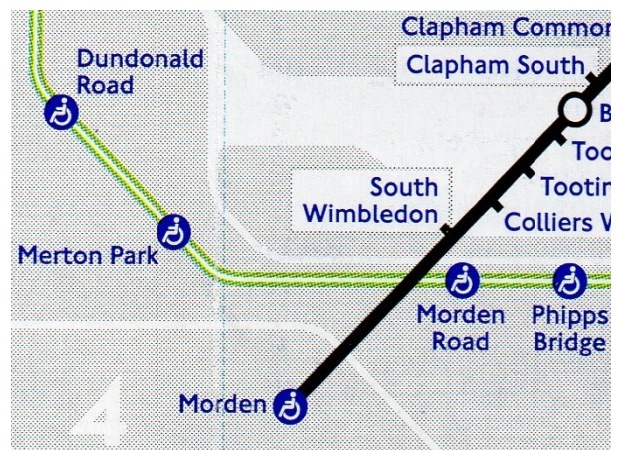
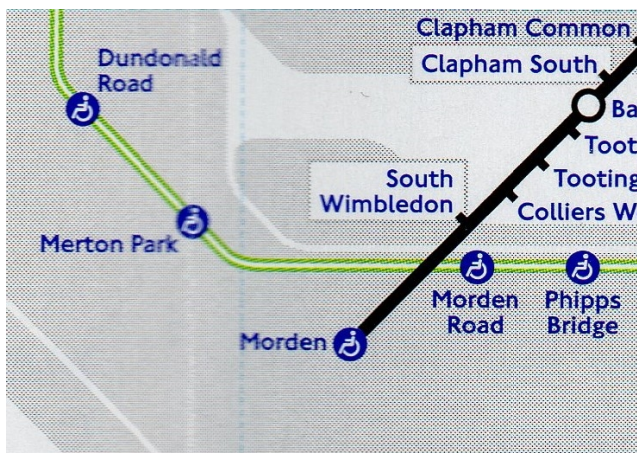
<http://diamondgeezer.blogspot.co.uk/2016/06/the-new-tube-map.html>

For further information to the changes to the June 2016 map see:

<http://diamondgeezer.blogspot.co.uk/2016/06/tube-map-june-2016.html>

Night tube

TfL have produced new underground maps for the Night Tube, the first in August (only Central and Victoria lines) and the second in October, adding the Jubilee line. Another is due in November when the Northern and Piccadilly lines join the night network. The two produced so far are subtly different but the maps cannot be considered the greatest pieces of graphic design.





Benchmarks in Brontë-land

Bill Hemwood

Many books by or for walkers and cyclists include the heights of summits, triangulation pillars and other significant features, but to quote the exact heights of 25 benchmarks along a route – accompanied by an appropriate symbol – seems most unusual.

Such is the case, however, in *A Spring-time Saunter: Round and About Brontë-*

land by Whiteley Turner,¹ which describes a four-day walk taken in the spring of 1905. The introduction explains that:

3. At certain points the height above the sea level is indicated by an arrow-head, or bench-mark, the character which is chiselled by the Ordnance Surveyors on buildings, walls, stone-posts, &c.: “ \wedge 1,000,” for instance, means 1,000 feet above the sea.

Accordingly, at the summit of the moorland road that leads from Hebden Bridge to Nelson, the author observes ...

Our map signifies that hereabouts is the surveyor's bench-mark, and we look for the stone, but see none. A little further, on our left, we perceive a rock beside, and level with, the road, and on this is chiselled the “crow-foot”—(\wedge 1276-5)—as we have heard called the arrow-like character.

... and while climbing what is now a section of the Pennine Way path between Ponden and Hebden Bridge ...

The three Withens now appear in view, and in a few minutes we are passing the Lower Withens (\wedge 1223-2) ; we now rise through fields, in which we fail to trace the path marked on our map, to Middle Withens* (\wedge 1292.3), and forward to Higher Withens (\wedge 1376.9). Emily Brontë's “Wuthering Heights,” and Halliwell Sutcliffe's “Lost Withens.”

The values of all the benchmarks cited in the book were taken from the 1892-3 revision of the relevant six-inch maps or twenty-five-inch plans of West Yorkshire. The extract above, showing Middle and Higher Withens, is from six-inch Yorkshire CXCIX.SW & SE, reproduced from NLS website <http://maps.nls.uk/> with kind permission.

Was Turner's precision unique, or are there perhaps other examples?

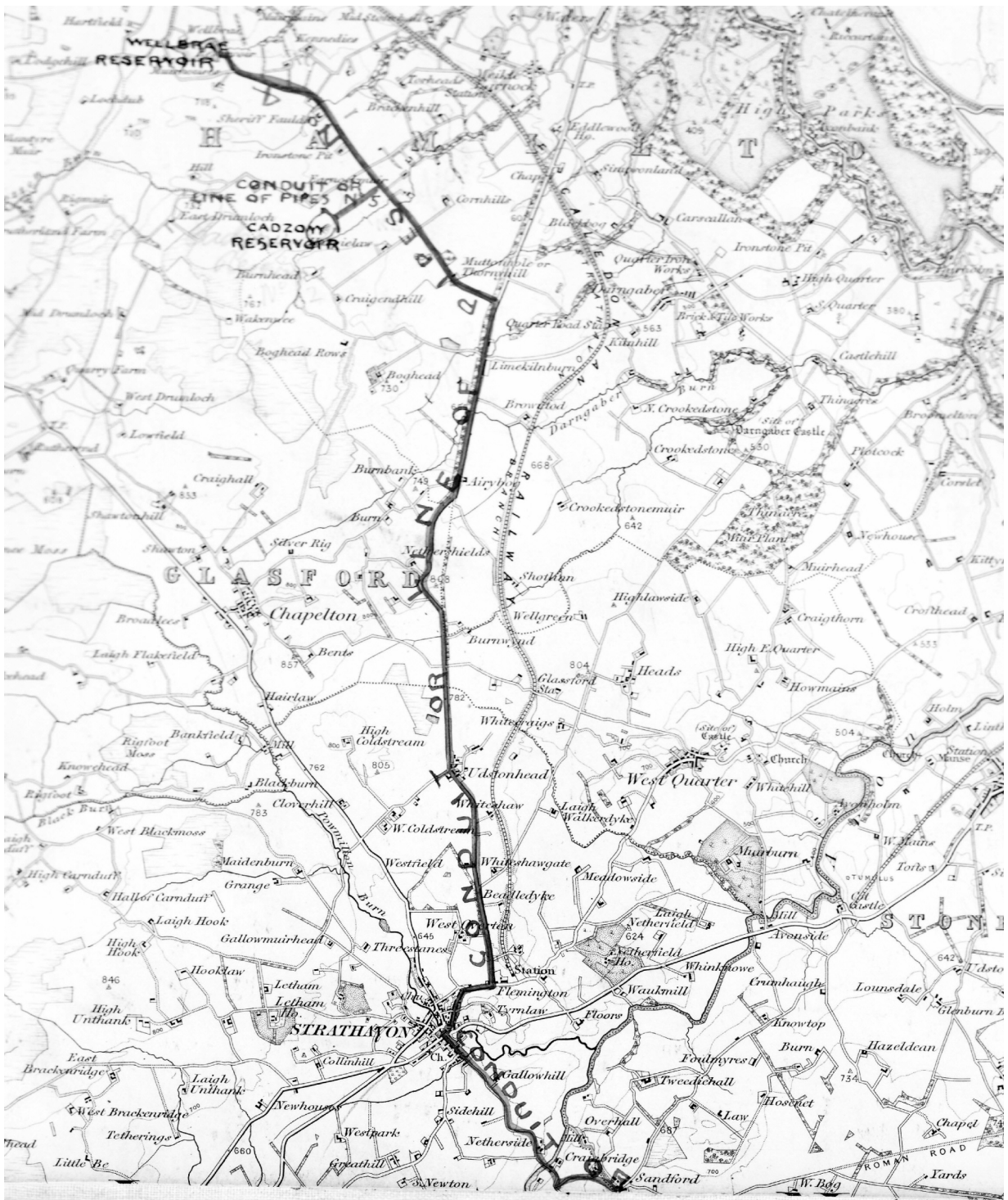
¹ Whiteley Turner, *A Spring-time Saunter: Round and About Brontë-land* (Halifax: Halifax Courier, 3rd edition 1913). He contributed many articles on walks to the Halifax Courier. https://en.wikipedia.org/wiki/Whiteley_Turner

Caledonian conduits

Malcolm McIvor

Following Richard Dean's article in *Sheetlines* 106, here is another example of the use of OS mapping for railway planning. These two extracts from a composite one-inch New Series of Scotland map show the pipelines that the Caledonian Railway installed to bring soft water to their bunkering centres. These conduits were between 15 and 30 miles long. I wonder how many of these pipelines still exist and whether they could be used to generate 'renewable energy'. I apologise for the poor quality of the reproductions; I no longer have the original maps as I donated them to the Caledonian Railway Society for their archive.





Use of the Ordnance Survey for planning rural sewerage

David L Walker

Richard Dean in his article *Ordnance Survey on the rails*¹ invites more attention to the use of OS data over the years and the benefits it has brought. In the same issue of *Sheetlines*, Bill Hines² draws attention to the reports by the Victorian sanitary commissions in Thomas Colby's library, and to Edwin Chadwick's letter seeking Colby's support. But, as recounted by Richard Oliver,³ controversy ensued over responsibility for, and financing of, the topographical surveys needed to plan sewerage projects. From the writer's own experience, this article illustrates the use of OS data for planning sewerage schemes in the twentieth century.

Although grant aid under the Rural Water Supplies and Sewerage Act of 1944 had been intended to make better provision for rural areas, extra resources were made available in the 1950s to support the 'Macmillan' programme of building over 300,000 houses a year. Consulting engineers, mostly in Westminster, gained reliable 'bread and butter' work by adding rural district councils to their portfolios of more illustrious clients.

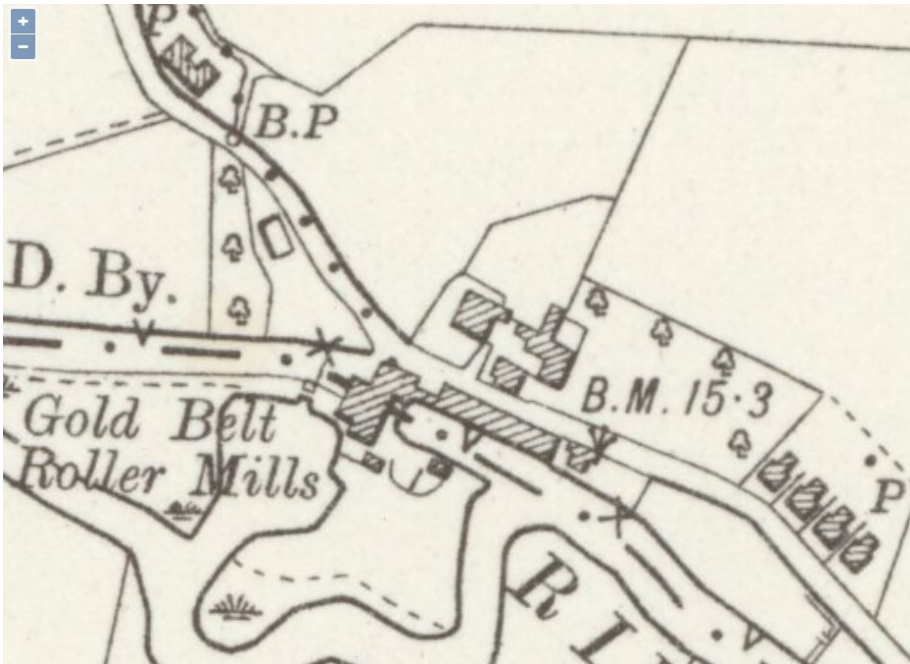
Schemes often covered several parishes at a time. To reduce the number of contract drawings, OS 25-inch plans (as we knew them) were cut and pasted to cover only the populated areas, and updated from planning applications to show later development. Licensed transparencies were made with the topography on the back, and the proposed sewer layout on top, to facilitate amendments. To avoid the need for wayleaves, sewers were normally planned within the highway curtilage, avoiding the edge of road as far as practicable, running straight between manholes no more than 300 feet apart, and (crucially) at a gradient no less than 1 in 250 (for seven inch pipes). Minimum cover was four feet, but the sewer also had to be deep enough to accommodate house connections at a gradient of 1 in 60. A series of pumping stations was often needed, especially in Lincolnshire.

Within this context, in 1960, the writer's training included the planning and costing of an extension to the Brompton sewerage scheme to include the properties shown in the figures. Regrettably, instead of an outing to Suffolk, only a short walk to Caxton Street was needed, to purchase the appropriate 25-inch plan from Cook, Hammond and Kell for 6s 8d. The OS benchmark at Brantham Mill confirmed that a small pumping station would be required nearby to connect to the village system. Sewer sections, as well as plans, were easily produced from the OS spot levels of the surface of the road, shown with a cross at regular intervals. This invaluable feature of OS plans on most village roads must have benefited generations of sewerage engineers.

¹ Richard Dean, 'Ordnance Survey on the rails', *Sheetlines* 106, 4-11.

² Bill Hines, 'Thomas Colby's book collection', *Sheetlines* 106, 12-20.

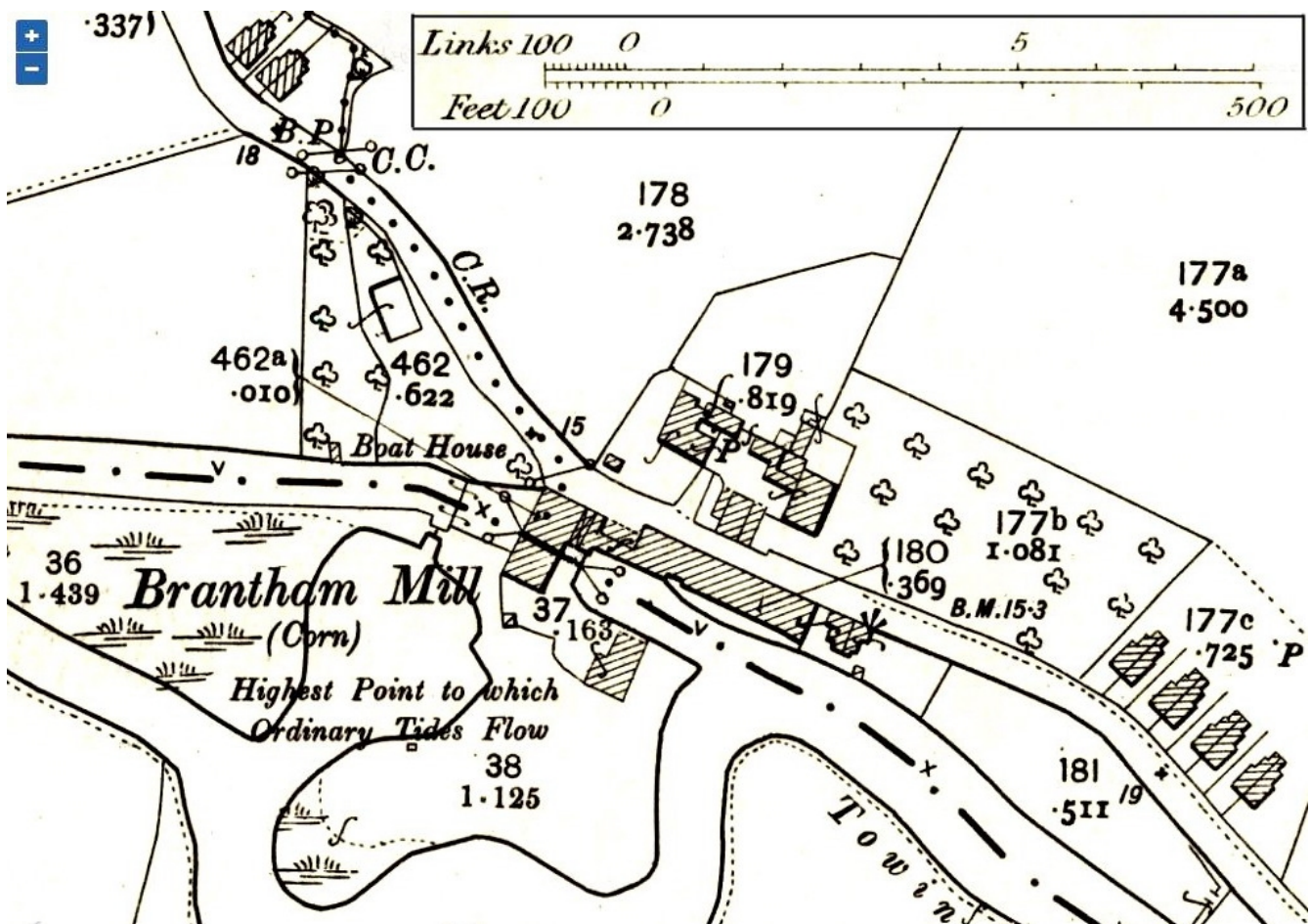
³ Richard Oliver, 'The Ordnance Survey in the Nineteenth Century', 2014 – see index references under 'Health'.



left
extract from six-inch
Essex NXIX.SE revised
1921.

below
extract from 25-inch
Suffolk LXXXVII.8
revised 1902.

Both images
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<http://maps.nls.uk/>



'The figures illustrate how 25-inch plans, despite being more out-of-date, were much more useful for planning rural sewerage than six-inch plans. Road levels, where shown, were closer together, and the delineation of individual properties provided an excellent basis for site inspections. At that time I was unaware of 'the battle of the scales' a century earlier, and I am impressed now to find that the

Treasury, usually penny-pinchers, decided in favour of the larger scale on the grounds that ‘... if the nation incurs the cost of a survey, that survey ought to be of the kind most generally useful.’⁴

It is of course easier to argue that public works should consider all potential beneficiaries than it is to recover a share of the costs from those beneficiaries (and especially so after sixty years). In the 1960s, consulting engineers’ fees were based on a percentage of the construction cost, and OS licence fees were presumably much less than the considerable reduction in design costs (a saving which was enjoyed in Westminster rather than Suffolk).

In unsewered districts, where by definition little new development had taken place, surprisingly few difficulties arose from the use of surveys made sixty years earlier, supplemented by planning information from the rural district council. For Brantham Mill, all that was needed was for the firm’s resident engineer then in Suffolk to inspect for any low-lying properties and any unexpected development. But occasionally problems occurred: a huge caravan site in Lincolnshire was discovered only just in time; a Bedfordshire farm was found to be discharging effluent from vegetable washing, which fortunately became controlled in 1961; and the possibility of a combined works to serve adjacent parishes was nearly overlooked as they belonged to different rural district councils.

However, the main issue was to provide for the housing estates which mushroomed as rural sewerage schemes came forward in turn. Ministry approval of sewerage schemes was subject to Treasury controls which tightened or relaxed under its budgetary regulator. When the need arose to adjust sewerage schemes to reconcile financial controls with the housing targets, OS 25-inch (actually 1:2500) plans proved invaluable in saving time as well as money.

FOR SALE AND WANTED

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To advertise contact info@charlesclosesociety.org

⁴ Richard Oliver, ‘The Ordnance Survey in the Nineteenth Century’, 2014, 267-269. Richard Oliver points out that this Treasury Minute favouring the adoption of the 1:2500 scale was not new in the 1850s: these words had first been written in 1840.

Working at Ordnance Survey in 1930s

Further to Alfred Buckle's memoir published in *Sheetlines* 106, below are his offer of employment and the standard conditions of employment applicable.



IMPORTANT

Please address your reply to—
"THE DIRECTOR GENERAL OF THE
ORDNANCE SURVEY."

Quote
and prepay the postage.

Telegrams :—"ORDSURVEY, SOUTHAMPTON."
Telephone :—5181 SOUTHAMPTON.



Ordnance Survey Office,

26th March, 35.

Southampton, 19.....

Dear Sir,

With reference to your application for employment on the Ordnance Survey, and the recent interview and test, I am desired by the Director General of the Ordnance Survey to offer you employment on the Ordnance Survey as a *Draughtsman* under the terms and conditions set out below and also in the accompanying statement.

The employment would in the first instance be for a probationary period of about one month. If at the end of this period your work is considered satisfactory, the employment will be extended for at least one year (including the probationary period), and it may be possible eventually to absorb you into the permanent establishment of the Department. Employment will be liable to termination on one week's notice by either the Department or yourself during the probationary period, and thereafter on one month's notice.

The salary during the probationary period will be fixed by age according to the following scale —

Between 18 and 19	£76.5.0.	per annum inclusive.
" 19 and 20	£91.10.0.	do.
" 20 and 21	£106.15.0.	do.
21 years of age and over	£108.0.0.	do.

The rate of pay for beginners below 18 years of age would have to be specially fixed.

If your services are retained at the end of the probationary period the rate of salary will be reviewed as soon as your work is up to Ordnance Survey standards, and the rate awarded will depend on the degree of professional skill shown.

Salary is paid monthly in arrears. (Probationary period weekly).

I am to ask you to inform me by return whether you accept the offer under the conditions given. Employment will commence on the 1st April 1935, and if you accept the conditions you should report to the *Ordnance Survey Office, 128, Cromwell Road, London. W.7.*
on/

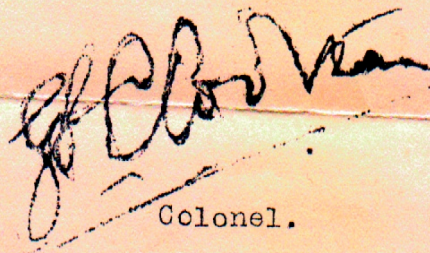
(2)

on that day. If, however, through inability to leave present employment or any other cause, you are unable to join this Department for duty on the 1st April next, I am to ask you to inform me as soon as possible what is the earliest date on which you can report for duty.

The medical examination as to fitness for employment, referred to in the attached statement, will be carried out by the medical officer of the Department on the date when you join for duty, and without expense to yourself.

No expenses in connection with your joining are admissible against public funds.

Yours faithfully,



Colonel.

ORDNANCE SURVEY.

CONDITIONS OF EMPLOYMENT OF SURVEYORS AND DRAUGHTSMEN.

Scales of Salary.

Surveyors£122.0.0. to £212.3.0. per annum.
In addition a Field Allowance of about 2s.5d. per working day is paid whilst actually working in the Field.

Group III draughtsmen£122.0.0. to £212.3.0. per annum.

In due time, and after passing certain standard tests, promotion is possible to Group II and ultimately Group I. The maximum pay for these Groups is at present £249.9s.0d. and £315.13s.0d. per annum.

Note: The above rates are known as Half-Consolidation rates, i.e. they are the Full-Consolidated salary rates subject to the deduction of one-half of the emergency cut made in Civil Service salaries in 1931. The full consolidated minima and maxima are:-

Group III	£124.0.0.	to	£215. 3.0.
"	II		£252.15.0.
"	I		£319.10.0.

Hours of Work (Office).

The hours of work are 8.30 a.m. to 12.30 p.m. and 1.30 p.m. to 4.30 p.m. from Monday to Friday, and 8.30 a.m. to 1 p.m. on Saturdays.

Hours of Work (Field).

8 a.m. to 5 p.m. during the period March to October.
8 a.m. to 4 p.m. during the period November to February.
Work ceases at 1 p.m. (all the year round) on Saturdays.

Leave.

No annual leave is allowed unless in very exceptional circumstances until three months' service has been completed.

In addition to public holidays, for the first and second years 12 days paid leave a year are granted. Where the employment begins after the commencement of a leave year, (1st April), only the proportionate amount of leave for that year is allowed. Until absorbed into the establishment only a proportionate part of the full period of leave may be regarded as accruing in respect of each completed month of service in a leave year.

Sick leave.

There is no sick leave in the case of employees with less than six months' service (exclusive of periods of sick or other leave without pay).

(2)

After the completion of six months' service and if over 18 years of age, ten weeks' sick leave on full pay may be allowed at the discretion of the Department.

Pensionable Establishment.

There is a scheme for the admission of Assistants employed in established grades to the pensionable establishment after 15 years' service, one half of which counts for pension.

Medical Examination.

A medical examination as to fitness for employment is required.

Ordnance Survey Office,

Southampton, March, 1935.

With thanks to Moira Grant for permission to reproduce her grandfather's documents



Right. Applying the mobile download scratch panel to Explorer maps

CCS visit to Dennis Maps

In September members travelled to Frome, Somerset, to see some of the two million Ordnance Survey and other maps printed each year at Dennis Maps.

Managing Director (and CCS member) Steve Burry explained that Dennis Maps was established following the demise of Butler, Tanner & Dennis. The new company is 25% owned by Ordnance Survey and 75% by the Felix Dennis Trust, who channel the profits to the Heart of England Forest charity.

A special plan of Ryde – the 1:2500 Special

Rob Wheeler

The progressive scanning of NLS's 1:2500 sheets has made accessible¹ a special sheet whose existence has not previously been noted. It had been labelled long ago by NLS as 'Hants 91.9 & 10'. Such a description was regularly applied to a sheet on standard sheet-lines where a small extrusion allowed all that needed to be shown of an adjacent sheet to be included. In this case, the sheet consists of the eastern part of 91.9 and the western part of 91.10. Because publication at this date was by parishes and Ryde is inconveniently divided between two parishes, the sheet actually has four components.

1. Eastern part of Newchurch 91.9.
2. Newchurch 91.10 (excluding the inset, which is mostly sand).
3. Western portion of St Helens 91.10.
4. That part of Ryde pier which would properly belong on a 91.6 but which was published within an inset on Newchurch 91.10. Whereas the original inset was a large one occupying the blank space where St Helens parish lay, now merely the end of the pier is shown on the sand adjoining the rest of the pier, without any inset box.

Within the top margin is a title 'ORDNANCE PLAN OF RYDE. ISLE OF WIGHT.' The lower margin contains scales, etc. Otherwise the margins are blank except where a couple of names and a bench mark height need to continue into the RH margin. There is a small extrusion in the top margin where sand continues beyond the neat line.

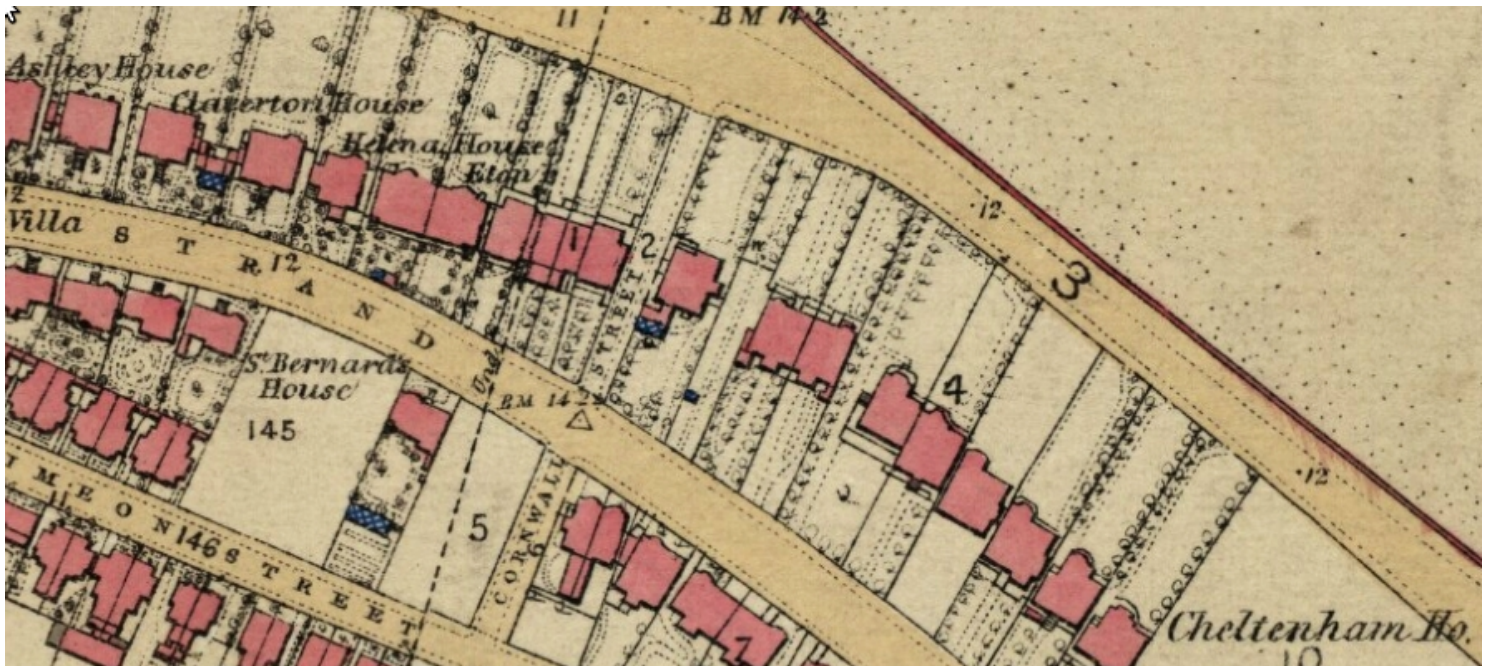


Fig 1: Join at parish boundary – note house names.

¹ <http://maps.nls.uk/view/105990355>

The whole thing is a cut-and-paste job. (I shall use this loose term rather than talk in terms of lithographic transfers, to avoid making any assumptions about the exact technology employed.) The join of (1) and (2) can be seen running along the front of Marine Villa in St Thomas Street and through its grounds northwards to the sea: features on one sheet are not always closed on the other, and lines do not always continue across the join perfectly.

The join of (2) and (3) is shown at figure 1. Again, lines do not continue across the parish boundary as smoothly as they might, but any irregularity is made less noticeable by the presence of the boundary symbol. What I want to draw attention to is a difference between the two parishes in deciding which names are worthy of inclusion. To the west of the boundary every other villa along the sea-front is named: the final name, 'Eton', has presumably lost the 'House' because this was drawn in the empty space corresponding to St Helens. To the east of the boundary, nothing is named until Cheltenham House is reached; the motivation was perhaps not so much that Cheltenham House was any grander than its neighbours, as the presence of empty space adjacent to it.

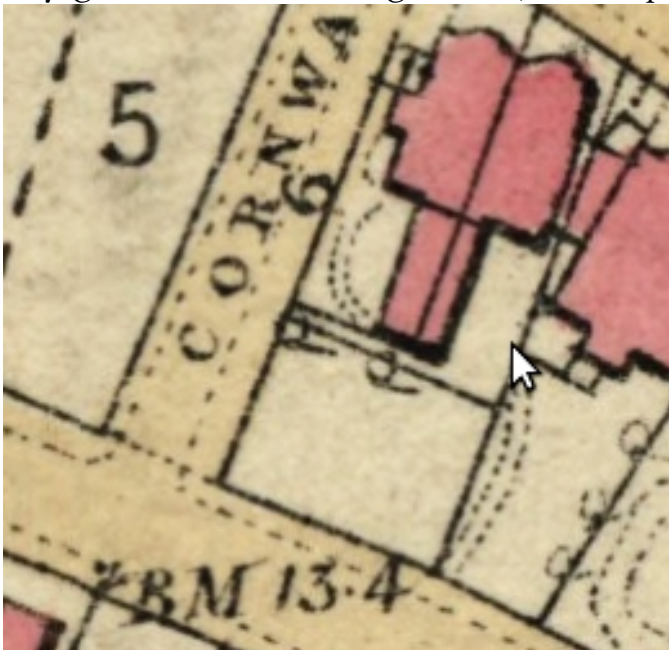


Fig 2: Further south from Fig 1.

One can also see a difference in the drawing of the garden trees: Newchurch trees are decidedly heavier than St Helens ones. And if one looks at the bench mark height in figure 2, one sees that the '3' is drawn with an angular upper lobe: all the St Helens '3's in height figures are like that, while all the Newchurch ones have a rounded upper lobe.

Doubtless all these differences can be found on the parent sheets in the main 1:2500 series. I have checked the specimens in the Bodleian Library bound volumes – though I confess I did not examine the finer points of draughtsmanship. A cut-and-paste job – surely no more need be said. And

yet, contrary to everything one might expect, there turn out to be differences between the Ryde Special and its parent sheets. I first noticed these when comparing the sheet against the 6-inch – a comparison one can do on-line – and I am indebted to Richard Oliver and Roger Hellyer for pointing out that the differences I had spotted were actually updates made at the 1:2500 scale. The differences from the six-inch I had spotted are shown by red numbers in figure 3.

(1) & (5) concern garden ornament. In this era the 1:2500 relies on actual detail to show gardens; the six-inch uses ornament, placed according to the annotations on the Field Examiner's trace. So these are not real differences; they certainly do not correspond to any difference between the Ryde Special and the standard 1:2500.



Fig 3: Extract from Record Map state of Hampshire XCI (1st edition). For annotations, see text.

the blue lines indicate 'subject to floods'. In contrast, the six-inch gives it a 'marsh' symbol. While marshes are often subject to floods, and land subject to floods is often marshy, the two categories are by no means synonymous and the two scales convey significantly different information. The difference between the 6-inch and the standard 1:2500 is a puzzle that cannot be resolved here. The difference between the two 1:2500 versions may represent no more than a lapse in the hand-colouring process.



*Fig 4:
Further south from fig 2*

(2) is another case of land-use ornament. The regular 1:2500 (though not the special sheet) carries a pattern of short blue lines; the area book² describes it as 'Pasture etc (subject to floods)'. I presume

(3), (4) and (6) are the key alterations. At (3) the Ryde special 1:2500 adds a masonry building fronting the street; one can see it on figure 4. At (4) it adds a rear wing (?) to what seems to be a pair of houses – see figure 2. At (5) it adds an open-sided structure of timber or iron, and it realigns the fence such that it can be accessed from the pasture/marsh. These three alterations correspond to differences between the special and regular 1:2500. Despite a thorough examination I failed to find any others. For all three substantive changes to lie immediately east of the parish boundary is unlikely to have come about by chance.

Before putting forward an explanation for this, it may be helpful to run through the process by which 1:2500 plans were surveyed and drawn.³

² Consulted at the Bodleian Library.

³ JB Harley, *The Ordnance Survey and Land-Use Mapping* (Historical Geography Research Series, 2, Dec 1979) p15.

1. A lower-order triangulation established a network of trig points.
2. A chain survey, controlled by these trigs, provided a sufficiently dense network for all detail to be located by measured offsets.
3. From the surveyor's notebooks from (2), an outline plan was drawn in the office.
4. A field examiner was provided with traces, in sections, of this plan. He checked its accuracy and added names (recording authorities in the Name Book). By annotation, he recorded land-use, and categorised certain types of road. He added certain types of detail, including 'improvements' - changes on the ground made since (2). By means of his annotated trace, he effectively designed the finished map.
5. The actual drawing of the map, with the addition of ornament, marginalia, etc, was done by a draughtsman in the office.
6. There was then a process of final examination and checking.

During the period of publication by parishes, it seems likely that stages (2) to (6) went ahead separately for each parish. In the case of Newchurch and St Helens, the contrasting treatment of house names, mentioned earlier, shows that, at the very least, stage (4) was separate. Publication of the Newchurch plans took place 15 months after the St Helens ones, so it is likely that there was a corresponding interval between field examination for the two parishes. When the trace was produced for the Newchurch examiner, there will already have been a St Helens plan in existence and the practice, certainly by the 1880s, was that the Newchurch examiner will have been provided with detail extending at least four or five chains outside his area.⁴ The logic for this would seem to be that in making checks and recording improvements he would be employing the type of graphical methods later to be used for revision, and for this purpose detail outside his area might improve his fixes. I have never seen any instruction that field examiners should record improvements outside their area (in this case, *parish*), but the same logic would suggest that, if they affected the immediate surroundings of buildings within his parish, they ought to be recorded on his trace. Thus, it would seem likely that changes (3), (4) and (6) on figure 3 were noted in the course of the field examination of Newchurch parish.⁵

How those changes were drawn on the Ryde Special is a more difficult question. The rear extension to the houses in figure 2 deserves careful examination. Not only is that extension shaded to its south and east but the shaded line of the 'old' back wall of the house has been 'unshaded' where the extension joins it.⁶ The manner in which this house is drawn is every bit as clear as that of the adjoining house. That might lead one to suppose that the 1:2500 fair

⁴ Instruction of 12.3.84 recorded in CCSA IM 401 5.

⁵ I am indebted to Richard Oliver for this suggestion.

⁶ Those interested in these matters will observe that the line is thickened to the inside of the building: so shading does not increase the apparent dimensions of the building.

drawing had been altered; but in that case, why was it not used in producing the six-inch? Perhaps, then, the change has been made by some form of litho-drawing, even though that technique usually produces less satisfactory results.

Special sheets like this are rare: the Survey saw them as requiring extra preparation and storage without any concomitant increase in sales. So why was Ryde treated in this way? First we must remember that Ryde was extremely fashionable: the *Fashionable List* in the Isle of Wight Observer for 28 Dec 1861 (to take an out-of-season example) includes for Ryde: 4 members of the nobility, 4 knights, 4 unaccompanied Ladies (mostly Dowagers), 3 mere Honourables, 2 General officers, 3 Admirals and 10 Colonels.

The sheet is undated but the corresponding six-inch bears a survey date (referring of course to survey at large scale) of 1862, so it is possible that this special sheet was produced in 1862 or early in 1863.⁷ Sir Henry James was seeking authority for the 1:2500 resurvey of southern England – granted in March 1863. If he wanted a sample sheet to show those in positions of influence, Ryde would make an admirable choice. Or perhaps it represents a short-lived policy from the era of publication by parishes, of producing special sheets wherever a town was unnaturally split in the manner of Ryde.

The special sheet appears not to have been deemed to require copyright deposit and it does not appear on the Bodleian Library's 1:2500 index bound with the Hampshire six-inch sheets; however, this index appears from the state of railways to date from the 1870s, so it is possible the plan appeared on earlier indexes. At any rate, it carries a price statement, suggesting that it was at least intended to be placed on public sale.

The explanation advanced for the incorporation of improvements adjacent to the parish boundary does not depend on the Ryde sheet being a politically-sensitive special sheet. It is quite possible that field examiners regularly recorded such changes immediately outside their area. Such changes would have been available for incorporation when the single-parish versions of the plans were filled to the neatlines in the modern manner. Was this ever done? It certainly suggests that a comparison of the two versions in the vicinity of parish boundaries might be worthwhile.

All images are reproduced with thanks from National Library of Scotland online collection at <http://maps.nls.uk/>

⁷ Since the standard Newchurch plans did not appear until March 1864, this would imply something of a backlog in routine publication.

British racing green: the reincarnation of the OS 'Quarter-Inch' Road map

Ed Fielden

Back at the turn of the decade Ordnance Survey's 1:250,000 Road Maps were – along with the 1:625,000 *Routeplanner* map and several of the *Tour* series – deemed to be anachronistic and unworthy of continued publication. The explosive growth of satellite navigation had made them increasingly irrelevant and so, unable to compete, the 'Quarter-Inch' was, apparently, history.¹

Imagine my surprise, therefore, when in September this year Ordnance Survey announced² the 'brand new' OS *Road* maps, explaining that a 'constant stream' of messages from customers had led to a change of heart.

At first glance the new maps appear virtually identical to those discontinued in 2010, however there are signs that a fair amount of work has gone into the relaunch of the series. There have been several changes, the most obvious being the inclusion of new symbols:



- a. Beach (designated)*
- b. National Park Visitor Centre*
- c. Water activities*
- d. Solar farm*

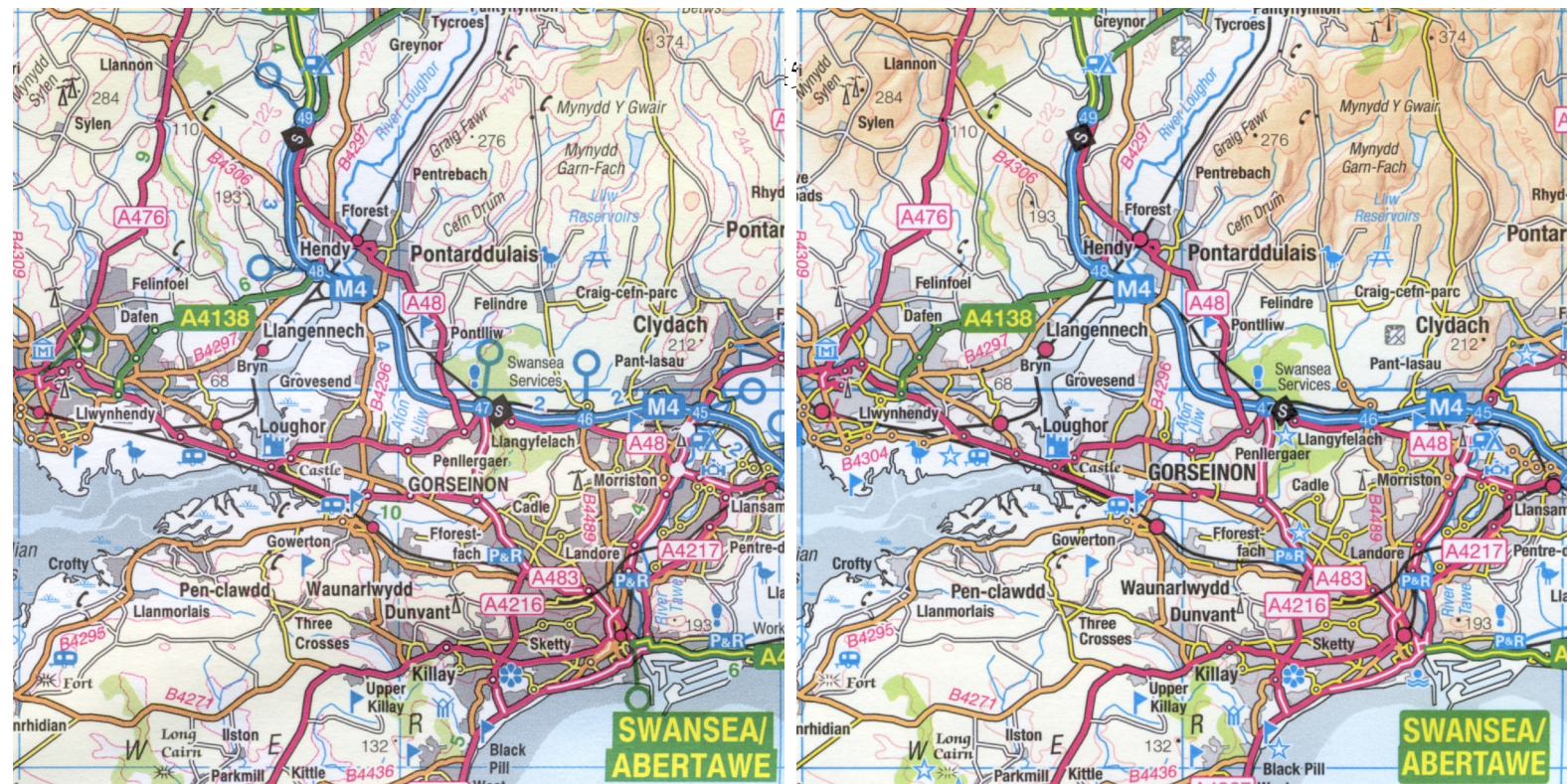
Many symbols have also been redrawn including those for marsh, camping, castle, telephone, railway station and transmitter mast. Extensive re-lettering or repositioning of place names, road numbers and spot heights has also occurred, while the colouring of layers is now much more pronounced and some (relatively subtle) hill-shading has been introduced. The contours at 200ft intervals remain unchanged.

The printed index leaflet of all place names featured on each sheet – which was stapled inside the cover of the former Road Maps – has been consigned to the cartographic dustbin. Its replacement is a much shorter 'Index of main towns and cities' on the legend panel.

Also of note is the withdrawal of the table of distances between towns and cities – which used to adorn a blank portion of the map face – and distance markings between primary destinations and major junctions. Perhaps the simple mental arithmetic skills which were once involved in adding up distances along one's intended route are themselves deemed to be a thing of the past?

¹ 'OS efficiency review: two dozen Travel Maps discontinued', *Sheetlines* 87, 50

² www.ordnancesurvey.co.uk/about/news/2016/os-relaunches-road-maps.html

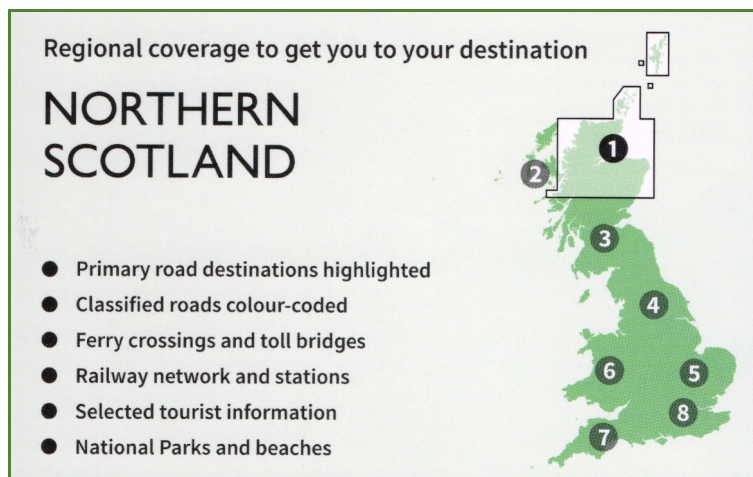


Detail from (left) OS Travel Map – Road sheet 7, edition E (2009) and (right) OS Road map sheet 7, 2016 edition. Note the changes to lettering, symbols and depiction of relief.

Aficionados of the ‘Quarter-Inch’ may be pleased to note, however, that the covers of the new *OS Road* maps – in the ‘2015 house style’ – retain British Racing Green colouring, albeit in a subtly lighter shade. Unlike contemporary *Explorer* and *Landranger* maps, however, the cover photographs are sourced from picture agencies, and – like the *Tour* maps – there is no mobile download to be had.

It was only six years ago that the century-old ‘Quarter-Inch’ was deemed obsolete. Can these ‘handy glovebox-sized’² *OS Road* maps now sit comfortably alongside the more advanced navigation technology of this in-car nation? That journey has only just begun.

The eight OS Road maps were published on 12 September 2016 and retail for £5.99 each.



The coverage diagram on the back cover of OS Road maps leaves the sheet boundaries a little vague.

The New Forest Tourist map of 1966

Rob Wheeler

Of all the maps OS has published at the one-inch or 1:50,000 scale since 1945, the most revolutionary is probably the New Forest *Tourist* sheet that appeared fifty years ago. In a reversion to nineteenth-century practice, contours were dropped, relief being indicated by hill-shading alone (plus spot heights). There was also an attempt to show land-use by background colour. The relevant legend is at figure 1, which shows a spectrum extending from meadow through downland to heath. Woodland is also shown but this appears to be a discrete category with a sharp edge.

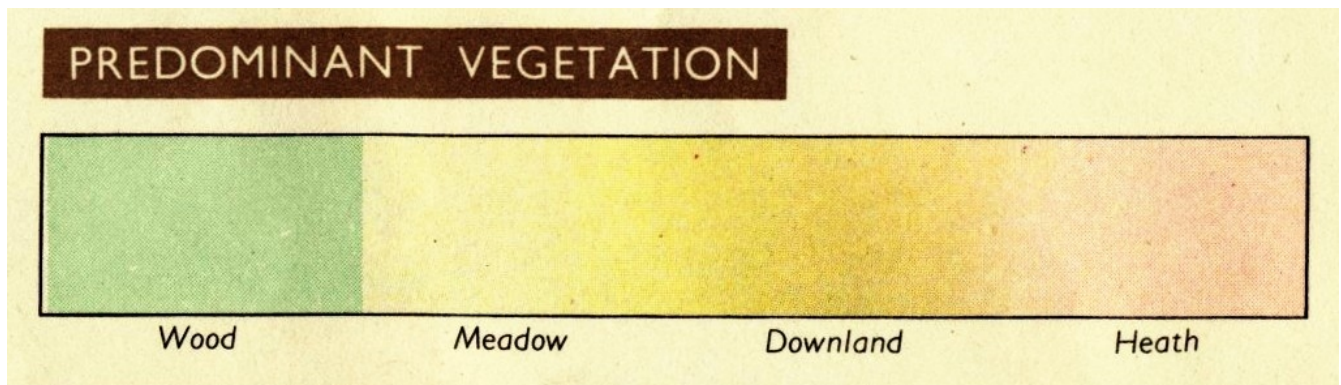


Figure 1. Land use spectrum

This 'spectrum' immediately poses questions of definition. What about arable? What does the mid-point between downland and heath actually look like on the ground? One could conceive of such a spectrum having a rigorous definition, based on the nutritional value per unit area, excluding arable or leys, with 'meadow', 'downland' and 'heath' being the three stages most characteristic of the area and readily understood by the ordinary map user; but where was the data for this to come from?

Was this seen as a prototype with wider application, or as a one-off? And what about other novel features, like the brown graticule markings and outer border? Finally, a technical question: how was the map printed? It was in the hope of finding answers to some of these questions that I investigated what evidence might be lurking in the CCS Archives.

Perusal of the catalogue suggested that OS 123, more particularly 123 1/1 and 123 1/4, was promising. That is not to say that relevant material might not be lurking elsewhere, merely that none of the other catalogue entries seemed specific enough to be worth looking at. What follows is based purely on a few papers in OS 123 and on careful inspection of the map.

From those papers, the technical question turns out to be the easy one to answer: the map was printed in 6 colours from the following 18 negatives.

Black: Outline; House fillings (screen); vegetation¹ (screen);

¹ Specifically tree-symbols, which had their own printing plate in the 10-colour version of the Seventh Series but were printed in screened black on the 6-colour version. See R Oliver, *A*

Green: New Forest boundary; woods (screen);

Brown: 2nd class roads; graticule; border tint; hill-shading;

Magenta: 1st class roads; Rights of Way; Tourist Info; Background;

Cyan: Water; Water tints (screen); Background;

Yellow: 3rd class roads; Background.

There were also two hold-out masks, for hill-shading and for Background.

The magenta/cyan/yellow combination is unusual at this date and seems to be driven by the Background negatives. This term is evidently being used for the land-use background colour which must have been prepared (painted?) in full colour and was now being printed by the 4-colour process (only without a black element).

I mentioned hold-out masks in a piece three years ago² about the Routemaster series. Poor registration in that series combined with over-enthusiastic use of masks to make it fairly easy to spot what was masked against what. The New Forest sheets have very good registration, and masking is used quite cautiously - typically against things like road fill which are cased, so the result would have looked respectable even if registration had been poor. Without the notes in the archive it would have been difficult to establish just what masks were used. In examining the map, it is useful to look for objects that are pure white, implying an absence both of hill-shading and of background colour.

Certain stations closed to passenger traffic (eg at Fawley) are one such object. How does one generate a mask against a white object without manual intervention? In this case the trick was to mask against the red stations shown on the previous state of the one-inch, before the negative had been updated to reflect closures. So, actually, the New Forest sheet has *three* station categories: open to passenger traffic (magenta fill); closed since 1957 (white fill) and closed earlier (background fill). An example of the third category is Wilton (GWR) at 090320 (*figure 2*).

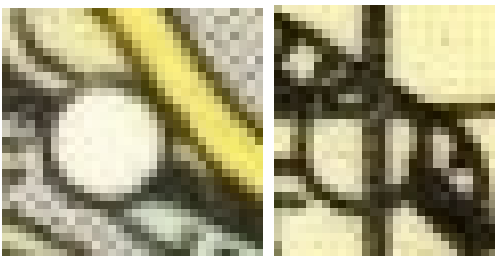


Figure 2: Two categories of closed station; Hythe (far left) and Wilton

Piers form another class of white objects. I presume that the background colour stopped at the high water mark. Road fill has been mentioned as one of the negatives masked. Building fill was not normally masked but for some inexplicable reason most of the buildings on Tarrant Rushton airfield *are* masked, and hence appear to be bathed in sunlight (*figure 3*). Tourist information is not masked, doubtless because, being uncased, it would be vulnerable to the slightest error in registration. A consequence of this, which few users will have spotted, is

Guide to the Ordnance Survey one-inch Seventh Series, 2004.

² Rob Wheeler, 'Masked Balls', *Sheetlines* 98, 38.

that symbols in the sea are magenta, while symbols on meadow land come out as red. Symbols which straddle the high water mark change colour: I suspect that the boat at Christchurch (*figure 4*) caught someone's eye at proof stage and a piece of background was manually cleaned off so that the boat could be all magenta.



Figure 3 above:

Sunlit buildings at Tarrant Rushton. The normal appearance of buildings can be seen to the west of the airfield

Figure 4 left: Boat symbol at Christchurch

Why were there separate masks for hill-shading and for background? Almost certainly this was because woods were consciously excluded from the land use spectrum but there was a desire to show relief across woodland; hence they needed to be masked from background but not from hill-shading.³

Turning from technical matters to the question of where the data came from, the files show the OS's concern that the new *Tourist* sheet should be up-to-date.

³ Figure 5 of Richard Oliver, 'Two interesting maps for OS225', *Sheetlines* 107,6 shows how much easier it is to mask unfilled roads against layers and woodland in the digital era. What has changed is that an unclassified road is now an entity, whereas in the 1960s it was merely two parallel lines on the detail negative.

It was noted that the component sheets had small-scale revision dates of 1956/7 and were due for cyclic revision in 1969. Producing a new map without revision was considered unacceptable, so adjustment of the 1964 revision programme was proposed to make effort available for some form of intermediate revision at the expense of certain remote areas currently scheduled for revision but which did not need it until their maps were due for replacement. The low water mark in Poole Harbour was seen as important to tourists, so new aerial photographs should be obtained. On the other hand, the Isle of Wight was seen as unimportant (meaning probably that tourists staying on the Island were most unlikely to buy a New Forest *Tourist* map) so no revision should be undertaken there.

The thinking a little later can be summarised from a note: 'Terms of Reference for Surveyors':

1. Some areas had large-scale survey material available.
2. The New Forest proper should be revised to full cyclic revision standards. Additionally, heath should be distinguished from rough pasture.
3. Certain areas outside the New Forest proper should also be revised to special (unspecified) standards.
4. The rest of the sheet should receive partial revision, to show
 - a. large housing schemes,
 - b. large public car parks outside towns,
 - c. important secondary roads,
 - d. inns and isolated large hotels,
 - e. places of special interest such as pony trekking establishments, flying clubs, sailing clubs, angling areas, stately homes, gardens open to visitors, and 'anything that the surveyor thinks would be of interest to a tourist'

The wording here is sloppy: perhaps it represents notes after a meeting rather than properly drawn up specifications. For example, 4(e) is evidently the specification for the Tourist Info negative and would apply throughout the sheet. Flying clubs are not usually regarded as tourist sites and one wonders whether it was the 'Model Aircraft Flying Area' near East Boldre that those involved were thinking of. The heath / rough pasture distinction at (2) remained on the published map, within the New Forest boundary.

In the event, full cyclic revision was undertaken in 1965 for the area of Sheet 180 (including the Isle of Wight) and for the New Forest proper. The rest of the map, according to the legend, had limited revision, 'which included major roads'. Inspection of the map shows that this revision extended to quite modest housing schemes; perhaps (4) above remains valid as a description of what was done.

These 'terms of reference' provide evidence for an interest in heath as a feature of tourist interest. There is no other evidence for any interest in land utilisation. Nor is there any sign of discussion of the overall appearance of the map. To some extent that may be because those discussions involved different people and the relevant papers have not been preserved, but insofar as discussion of map design had an impact on revision requirements we might expect to have some mention of it. The absence of any mention suggests that the

dramatic innovations in the appearance of the map were only decided upon when the revision was already under way.

So where did data come from for the 'Background' image? In the absence of any documentary evidence, the only way to decide how the land utilisation was derived is to look at the map. One noticeable characteristic is that built-up areas are generally characterised as 'meadow'. This is appropriate for (eg) Salisbury, but Bournemouth is generally understood to have been developed on what had been heathland. The rough pasture around SZ0695 is instructive: the Old Series shows it as part of Canford Heath; the 1st Land Utilisation Survey marks it as heath; but the *Tourist* map, now that has been encroached upon by urban sprawl, shows it as meadow. It does rather look as though known heath and known downland were coloured accordingly, anything else that was low-lying, urban or suburban was coloured as meadow, and a gradual blurring of colours across the intermediate areas was introduced to avoid difficult questions about where one category stopped and another started. In other words, it appears to have been a fudge, and was not seen as part of a larger programme for the one-inch series.

There is a piece of (negative) documentary evidence for this assertion. The process of transferring the graticules and the associated outer border from black to brown, together with the introduction of a brown screen between inner and outer borders, was costed. The cost of 'the border treatment' (which may or may not include the graticules) was to be set against 'Experimental'. The implication would seem to be that this feature was being considered for wider application. There is nothing about how the costs of the 'Background' image - surely much greater - were to be categorised. The implication is that it was a one-off.

Of course, there were broader issues in play. Space travel was a hot topic; earth observation satellites were being talked about; and commercial map producers were exploring the idea of maps that showed terrain 'as it would look from space'. With its hill-shading and vegetation tints, the New Forest *Tourist* sheet appears to belong to this movement. Even if it was driven by someone whose primary interest lay in graphic design, he must surely have been given the nod by the senior officers of the Survey.

Political dialogue at the time presented a divide between the 'white heat of a scientific revolution'⁴ and the 'natural Luddites', whose ignorance of science and engineering made them singularly unfit to govern.⁵ The 1964 General Election can be regarded as the rejection of an Establishment seen as 'natural Luddites'. The Ordnance Survey might be a technical organisation but it was a part of that Establishment and its maps had a distinctly dated look. The New Forest *Tourist* map may have been half-baked, but was it valued as evidence that the OS was embracing the white-hot technological revolution? Does that explain why it took the form it did? The apparent date when the novel design was introduced would appear to be 1965, and this might fit a perceived need for a new image.

⁴ Harold Wilson, Labour Party Conference, 1963

⁵ CP Snow, Rede Lecture, 1959

Manchester mystery ship

Alexandra Mitchell asks:

I am looking for some information regarding an OS map of the Manchester Ship Canal showing a 'phantom ship'.

Owen and Pilbeam in 'Ordnance Survey: Map Makers to Britain since 1791', a history of the OS published for its bicentenary in 1991, recount that a 'phantom ship' was added in jest by a draughtsman on a plan showing the Manchester Ship Canal, but was not erased before going to print and put on sale (page 135).

Unfortunately, the text does not provide any further details about the sheet number of the map or the date it was published.

The Manchester Ship Canal opened in 1894, so it could date from any time after this point. I wonder whether you have come across the story of the phantom ship, or have any information about it?

It seems that the map was withdrawn from sale when the mistake was realised and would therefore be difficult to track down, but it would be fantastic to find a version of the error.

Any information you could provide would be greatly appreciated.

David Archer replies:

Cartographers trying to hide a piece of personal unauthorised detail on maps is well documented. Hiding their initials in cliffs, or naming their mother's house, for example. In about 1990, John Paddy Browne told me of this map. The story went something like this.

A cartographer was preparing a large scale sheet showing a lock on the Manchester Ship Canal and thought it looked like a large ship. So he added two or three funnels, which appeared as circles in the lock. When he had finished the work ready for printing, he scrubbed out the funnels. Someone else seems to have taken the previous state of the artwork for printing. So, it was printed with funnels and nobody noticed.

Until a customer rang saying he had bought a copy, and the lock looked very much like a ship. When the artwork (or whatever it is called) was dug out, the 'bosses' could see that the funnels had been deleted and that the wrong artwork had been sent for printing.

Remaining copies were probably destroyed, but I bet someone has a copy somewhere. I am pretty sure this was post-1945. There is a figure quoted saying that on average, only about eight copies of any large scale sheet are sold.



Does anyone know which lock? or which map? or better still, have a copy? Get in touch!

Part of 'Plan of the Manchester Ship Canal' published by Port of Manchester, June 1921.

The British system & the modified British system of grid referencing, inversion of references & pinpointing

Mike Nolan

When, in 1977, 19 Topographic Squadron R.E. celebrated the 150th anniversary of its formation, contact was made with several veterans of the pre-war 'Survey Battalion' who had, while on duty at the Ordnance Survey at Southampton and elsewhere, also periodically carried out military training in the 'War Trades' at Fort Southwick (Portsmouth) or Fort Bembridge (Isle of Wight). Many of these men served later in the Field Survey Companies R.E. throughout the war in the BEF, Middle East, North West Africa, Sicily, Italy and North West Europe and they were the source of much anecdotal information and many photographs of that period towards the unit's history.

On planning to visit one of these men near Bournemouth I was given, over the phone, a six-figure grid reference of his house, as, say, 938746. Looking at the map, this reference made no sense to me. On calling back for clarification I was directed to look for square 9387, then to go to 46 within that square. His house was actually at grid reference 934876. At the time, I thought that this was actually quite a neat and natural way of locating a six-figure grid reference on the map by first finding the easting line of the kilometre square then the northing line and then the 100 metre easting and northing offsets within the square, but it was of course quite contrary to current military practice of giving the complete eastings before complete northings of a six-figure grid reference. Though I did not know it at the time, this was an example of 'inversion of references'.

The impulse, mistakenly to give references in this fashion is described in the *Manual of Map Reading Photo Reading & Field Sketching*, 1929, page 54, and it was one of the undesirable results of thinking of the grid as a set of squares rather than a combination of two sets of equally spaced parallel lines, eastings and northings:

'iii. The inversion of references. Thus, in a square in which 31 appears (often called square 31) the impulse is often to refer to a point as 3106 instead of 3016'

The British system

Plate X in that manual is an example of a large scale, 1:20,000 artillery map, showing the British system in which each 10km grid square contains 100 one-km squares whose south west corners are numbered 00 to 99 in red (*figure 1*).

As stated on page 51:

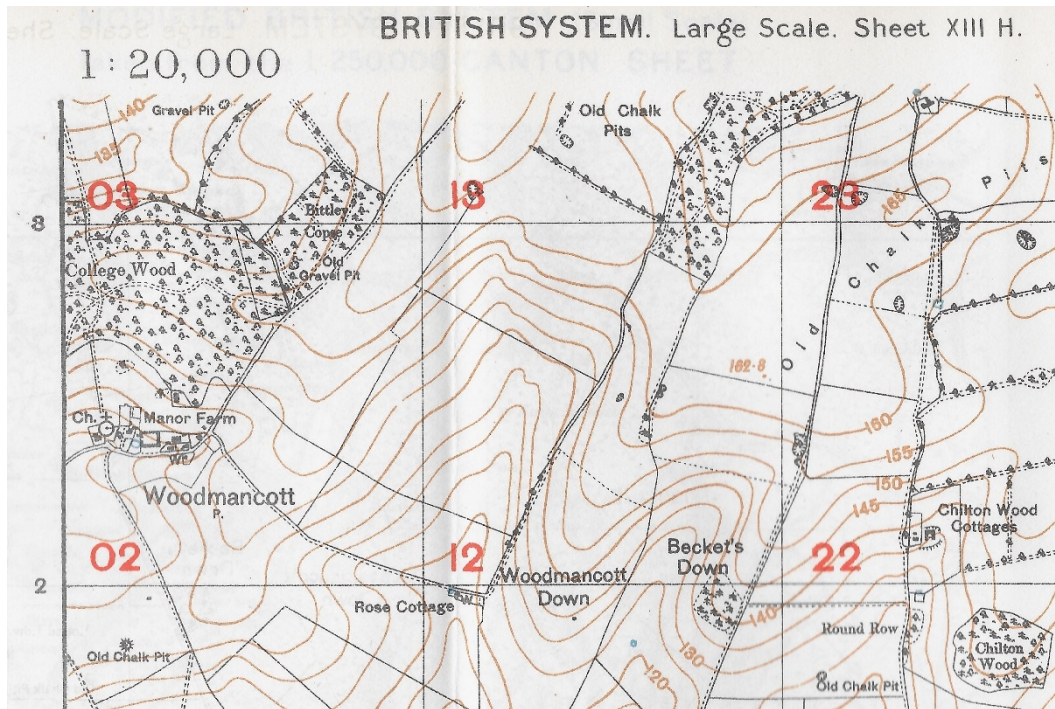
'The British system was adopted in 1919 and was to continue in use on maps of Great Britain until a new Ordnance Survey edition appears'

The Modified British system

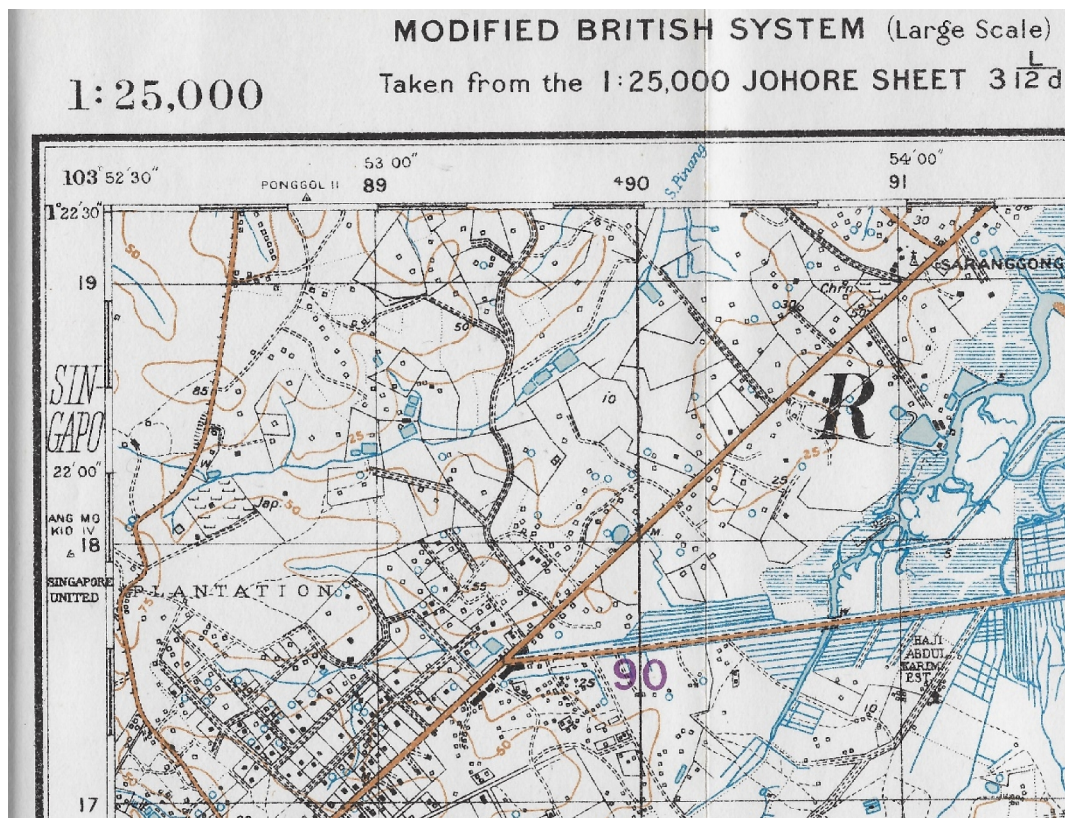
The British system was not suitable for maps at medium scales. On a 1:250,000 scale map a 10km square is only 4cms square on the map and a kilometre square is only 4mm square on the map. A kilometre grid of 4mm squares was simply too dense to be shown on the map. For this scale, (and also for 1:243,440), the Modified British system was introduced whereby only 10km squares were shown.

In addition to marginal square values, a 'ladder' of bold 5km and 10km values was to be shown on the face of the map.

This 'ladder' of values on the face was also shown on large scale series, in lieu of the older system of numbers 00 to 99, as shown on an extract of a 1:25,000 scale map of Singapore at Plate XII of the 1929 Manual (*figures 2 and 3*).

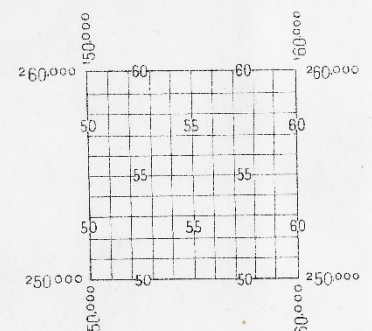


*Figure 1 (left)
Extract from Plate X
showing British System,
with grid numbers in
red on map face*



*Figures 2 and 3 (below)
Extract from Plate XII
showing Modified
British System, with
grid numbers in purple
on map face*

DIAGRAM SHOWING HOW GRID NUMBERS ARE SHEWN ON THE FACE OF THE MAP.



Pinpointing & rounding-off references

Some time ago there was correspondence in *Sheetlines* on the rounding-off of grid references. At the time, I responded by saying that the question never arises since all grid references refer to grid 'squares', whether 10km, 1km or 100m in size, the figures being the S.W. corner of a square. That was, and is still, I believe, current military practice. Grid references are distinct from survey co-ordinates which are quoted to the nearest significant figure, commonly the nearest centimetre. Pages 64-65 of the 1921 Manual refers to co-ordinates and 'pinpoints':

'If we want to describe P more accurately we take hundredths of the square side instead of tenths, and use 6-figure co-ordinates. Thus, supposing P to be 410 metres east and 620 metres north, its 'pinpoint' co-ordinates are A.5,41-3,62'

In 1921:

'a comma should always be put after the figure denoting kilometres, and a line or dash between the east and north co-ordinates; so that references would be written in any of the following forms: 5,4-3,6; 4.57-6.83; 3.21/5.42'

Survey Co-ordinates were described in the 1921 Manual thus:

'The above description shows how map references are given. When exact co-ordinates are required for calculations, the full figures must be given. Thus for the same point P the co-ordinates to the nearest metre might be: 155.412 East; 443.623 North'

Fortunately, this system of using commas, hyphens and slashes seems to have been discarded by the time the 1929 Manual was produced.

Winterbotham, in his review of the 1921 Manual in the R.E. Journal, objected to the inclusion of the small square number in each kilometre square which:

may seriously interfere with the map detail, and is an undeserved reflection on the average intelligence.

On referencing he stated:

A much more serious point, however, is the insertion of commas and dashes in the co-ordinates themselves. A reference such as A 5473 is all-sufficient (within a 10-km square). To make it into A5, 4-7, 3 will imply such cumulative troubles in telegrams, reports, letters, and printed and typed orders that the rule will, inevitably, be honoured more in the breach than the observance.

On pages 55-56 of the 1929 Manual an example is given of the use of a reference card, or 'romer' for giving accurate references. The six-figure reference given is 934486 but it then explains that the point being referenced is actually 41/100ths east and 59/100ths north of square 9348. Modern usage would still give a six-figure reference of 934485 but the manual refers to the position, implicitly an eight-figure reference of 93414859, as a 'Pin Point' reference '*seldom required except by technical troops.*' in which the nearest unit has been accepted, perversely, by 'rounding up'.

History of the British Modified grid

The history of, and reasons for, the Modified British Grid were described by McLeod in a short note dated 1927:

1. The British grid as used at present on our 1-inch maps was evolved during the latter stages of the war, but was not brought into operation in France. On its introduction in 1919, there were a good many complaints which have since died out completely. The one occasion on which it was used during the war was in Italy. There, too, certain complaints were made in the first fortnight, after which it was universally admitted to be better than the system employed on the Western Front.

2. Like almost all the methods inherited from the war, the British grid suffers from being suitable to trench warfare and not to mobile warfare. The British system depends upon having, upon every map which is used, squares – the sides of which are equal to one kilometre. Originally it was designed for the 1:20,000 maps in France. When put upon the 1-inch maps the squares became very small and upon $\frac{1}{4}$ -inch maps they became so small as to become absolutely impossible. In manoeuvres in Hampshire in 1924 an endeavour was made to use this grid on the $\frac{1}{4}$ -inch, which resulted in 16 similar references on the same $\frac{1}{4}$ -inch sheet. Confusion was bound to result and the Staff College commented upon that confusion.

3. In 1926, when things began to look unpleasant in China it was necessary to prepare maps for possible eventualities. Much of the country for which maps had to be prepared was very little known and the $\frac{1}{4}$ -inch was the largest scale which could be undertaken. In order that the maps might be gridded (an essential factor in a country in which the place names are of no use), a new system had to be devised. The modified British system was evolved after considerable discussion. It was nothing more than the old British system enlarged 10 times so as to make it available at small scales as well as on large scales.

4. In the spring exercises at Winchester in 1927, the C.I.G.S. made it clear that we must practice writing orders upon the $\frac{1}{4}$ -inch scale. It has further been determined that our map policy is to issue to each arm and to each individual as far as possible, that scale of map which is most convenient for his work. The various scales (from 3-inches to the mile to $\frac{1}{4}$ -inch to the mile) are linked up by this common grid on the modified British system.

5. Those who have tried the modified British system find it perfectly easy to use so long as they make up their minds that it is something they have to learn. It is only by the employment of a system of this sort that we can enable the Army at large to use different scale maps, and yet to understand reports and orders.

War Office, December, 1927.

Footnote

In the manuals, emphasis is placed on the use of either yards or metric units for grid squares and examples of each are given. For simplicity, generally, only metric units are referred to in this note.

For an up-to-date map - go to Stanford
Rob Wheeler



Edward Stanford did a lot of business right up to the First World War in enhancing OS maps – and charging purchasers quite highly for the work. The illustration shows a typical product: roads hand-coloured in brown, railways in red, parks in green, county boundaries in various colours, and the edge of the sea in blue. The result is pleasing, even if blue beaches are not to everyone's taste. This one is what was called a Radius Map, with a series of circles at one-mile intervals, all centred on a specified location, in this case Battle. It uses a large part of Old Series Sheet 5, with portions of three adjoining sheets. Using the Society's latest monograph,¹ one can establish that it is State 27 of Sheet 5, which came out in late 1871 or early 1872, and was superseded in the summer of 1873. The portions of the other three sheets used cannot be dated so precisely. But it would seem likely that the map was made up in 1872-3, or – allowing for the continuing use of old stock – perhaps 1874.

The railway from Newhaven to Seaford was opened in 1864, but the OS had been slow to add it to the map; indeed it did not appear until 1878. If one examines the illustration carefully, one can see that there is no underlying railway

¹ Roger Hellyer & Richard Oliver, *The First Ordnance Survey Map*, Charles Close Society, 2015.

symbol: the railway has been added in red ink, with a pen. The ink is perhaps not quite the same as that used for colouring railways elsewhere, but there is no doubt that it was drawn before the sheet was dissected. It must therefore have been drawn by Stanford's. So that firm's enhancement of the map was not merely cosmetic: they had actually updated detail that the OS was not yet showing.

One possibility that ought not to be discounted is that the department that made up these maps was using old stock, and the map was actually made up in or after 1878; realising that a purchaser might object if this expensive product lacked a railway that was shown, by now, on the ordinary sheets and was already 14 years old, the department in question perhaps sought to hide their error (or meanness) by adding the railway by hand. But in that case one would expect them to have copied the location of the railway from the latest state. What they have done is to show the new branch leaving the original line a significant distance north of Newhaven Harbour station;² in fact the line diverges in the middle of the harbour station, and that is how the OS showed it in 1878. The depiction of the eastern end of the branch on this map is highly accurate, so I am inclined to suppose that the map was produced before 1878 and Stanfords were copying some source other than the OS. Can anyone suggest what that source might have been?

Flying maps

Peter Stubbs writes: I have a concertina 1937 flying map published by the Automobile Association and the Royal aero club of the route between Cairo and Khartoum. I understand that the AA started an Aviation section in about 1929 to produce these maps for their flying members. They stopped when the war broke out. I have been unable to find out more about these maps. Do you have any information on them and how many they produced?

Richard Oliver replies: The main source for the AA seems to be David Keir & Bryan Morgan, *Golden Milestone: 50 years of the AA*, (AA, 1955), which (pp 66-7) indicates that the AA actually set up an aviation section in 1909, but it was 'disrupted' by the war in 1914, and revived in 1928: services included 'air patrolmen' (recruited from ex-RAF) at airfields and, by 1929, maps 'for home as well as for European use'. The section seems to have been 'interrupted' by WWII, and not revived. The maps issued for use in Britain are standard OS aviation maps, but reassembled on the AA's own, larger, sheet lines, waterproof-sprayed, and in very stiff covers. They seem to have been hired, but I have seen them with 'owners names', suggesting they might also have been sold, and there is also a 'Second Series' - according to the covers - which seems to be later 1930s. I don't know what mapping was used overseas - presumably the nearest equivalent to the domestic official aviation mapping.

² I mean the station which then was at the end of the line: at a later date one has to distinguish the Harbour station, Harbour Hotel station, and the wharf / Maritime station, whose names changed in a complex fashion.

Kerry musings

David Archer

This is an experimental musing, where the reader can contribute to the nonsense. I will start it off, set the scene, give a few examples, and you can add more from your own experience. And if there is a good response, maybe something will appear in the next issue, Editors willing. Similar to crowd funding, which is all the rage, or at least was increasing in popularity when I started this piece, which might be years before you read it. If I get an idea for a musing, I jot down as much as possible and frequently put it aside, only returning to it a couple of years later. Which probably explains a lot.

So, to set the scene. You are on a business trip to the other end of the country, where they all talk funny and lack a sense of humour. On arrival, the taxi from the station turns on to the main road and immediately passes a second-hand bookshop which you decide to visit when returning home. All goes well with your meeting, but you get to the bookshop with only twenty minutes until your train leaves. Being a Charles Close Society member, you instantly find the box of maps and after two minutes, decide there is nothing of interest. On leaving, you glance behind the desk and see some exceedingly interesting maps on top of an open box of books. You recognise the edges of at least four megareare covers amongst the dozen or so maps dominoed across the books. Each has been the subject of endless daydreams. The find of a lifetime. The only snag being that although you have found them, they do not appear to have been priced. Indeed, from experience, you can tell that they have been left along with the books for the shop owner to look at and offer for. Work in progress.

With eighteen minutes to go, what happens next? You curse, and leave the shop as a coffee and sandwich are needed to take on the train with you? You take a business card from the pile on the desk and vow to telephone first thing tomorrow morning? You tell the person behind the desk that there is a fire in the back room, grab the maps, leave two twenties and leg it? No, being a CCS member, you take a deep breath, approach the desk and start talking. At the very least one would be honour-bound to make enquiries there and then. "May I have a look at those maps on the box, please?" "Yes, but I have not bought them yet," or "Yes, but I have not priced them yet", which is slightly more promising.

Four minutes later, and you are pale and shaking. Does it show? Could you possibly speak? No. So you croak "I would quite like some of these, but my train leaves in fourteen minutes, could you possibly price them now?" This is where I start it off, and you can add your experiences.

".... could you possibly price them now?"

"No. I must get these books priced for an important customer coming in later on."

"No. I want to put them on my website", or "No. I want to try them on eBay".

"No. I want to take them to a book fair next weekend."

"No. I have not decided whether to sell them or not", or "No. I want them for myself".

“No. I never rush pricing. These look more interesting than any I have had before, so will need careful consideration.” Meaning, I know they are good but I will need to think carefully how many noughts to put on the end.

“No. I have mentioned them to a good customer who buys maps, and he is coming in tomorrow to look at them.” And by the speed of his twitch, I can tell how good they are and adjust the price accordingly.

“No. A good customer who collects maps saw them this morning and will check his list when he gets home.” Absolute rubbish. Any collector would not need to consult a list and would have refused to leave the shop without them.

“No. I want them for a window display of 1930s novels.” Great, then they will fade and curl at the edges.

“No. I am just shutting the shop and have a train to catch in fourteen minutes.”

“No. My wife prices the maps. She will be in on Saturday.”

“No. I’ve lost my glasses. I must have left them on a bookshelf somewhere.”

“No. And when they are priced, I will dribble them into the map box over time as I never reserve maps for anyone. If regular map customers fail to find something nice once in a while, they stop coming in, which would be a great loss as most drift on to the books after the maps and usually buy something each visit.”

“No. And when they are priced, we do not send anything by post.”

“No. They are not mine yet.”

“No. I sell all my Ordnance Survey maps to David Archer.” Over the years, various customers have reported being told this by different booksellers. Alas, totally untrue. Ten minutes to go.

Now it is your turn, “No,”

For second-hand bookshop, read antiquarian bookshop; leather bindings everywhere, smell of polish and book cleaner, nice carpets and armchairs, soft music and no other maps in sight.

“....could you possibly price them now?”

“No. I have never seen anything like these before, and I am curious as to how they will be received by my customers.”

“No. I want them to add interest to my next catalogue.”

“No. I have an arrangement with another bookseller, he takes my cheap maps and paperbacks, whilst I take his antiquarian material. Not that he ever comes up with much, but then neither do I for him.”

Second-hand bookshop again.

“.... could you possibly price them now?”

“Yes certainly. The whole collection cost a lot and I need to get some money back quickly.”

“Yes of course I will. I know how frustrating it is to want something that is not priced.”

“Yes, but not until I find my glasses, I must have left them on a bookshelf somewhere.”

“Yes, and if you take them all, there will be a small discount as I don’t like

maps in the shop. They make the place look untidy. I just want rid of them."

"Yes, certainly, I like maps in really nice condition to sell quickly, otherwise they get scuffed in the box and when they look sad they fail to sell." "Excuse me" you reply, "but these maps would sell for a very good price even after a tank had been over them on a muddy battleground." As a CCS member you *would* feel obliged to say that, wouldn't you?

"Yes, which ones are you interested in?" The killer question. The pit-with-upward-pointing-sharpened-spikes-at-the-bottom question. Do you identify the cream, or say that all are of interest and make the prospect of pricing them quickly seem like too big a job? But they are all cream, the *crème de la crème* of Miss Brodie is merely semi-skimmed milk compared to these beauties. So, you shrug, and mumble a croak that all are of interest. "All OS maps are £2.50 each." Hah, hah, I am only joking. They never say that. Although I once went into a bookshop where the older the maps, the lower the price. Clean 1:50,000s were £1.75, Revised New Series in colour 25p. "Nobody wants out of date maps" the bookseller said. But books were different. Nine minutes to go.

"Yes, but I have never seen these before, and they are in lovely condition with quite attractive covers. What would you offer for them?" Same pit, but with poison on the end of the spikes, and needing the benefit of a manual of negotiating tactics twelve inches thick. The price offered must be high enough to get agreement there and then, but alas for the shop owner, and original seller, not sky-high, as befits the maps. Anything way above the usual shop price would give rise to suspicion and alarm. "That's a lot, they must be really unusual, perhaps I should investigate them before pricing them. There's a society for OS maps, isn't there?" In my experience, if the price seems fair and not over generous, thus not arousing suspicion, the shop owner will agree and will not try to nudge you up. And if they do, so what, the mortgage is paid off, you want them and will never get a chance such as this again. If you had to bid against other collectors in an auction, the final price would be far higher.

"Your offer is far too high. I see that you do not know much about Ordnance Survey maps." In the very early days of eBay I came across a couple of quite scarce maps and asked the seller whether he had second copies available, thus initiating a dialogue and not breaking the rules as I understood them. No second copies, but I was asked to make an offer for those listed, and was told it was too much, so we agreed on a lower price, and as no bids had been placed the seller felt he could withdraw the maps from eBay. My new friend turned out to be a bookseller, with a shop.

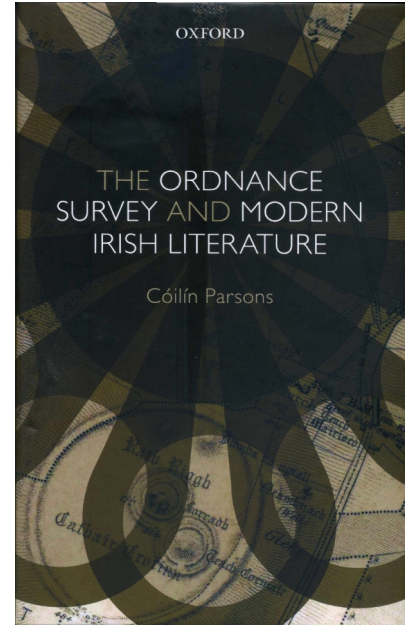
"Yes, I am sure that will be fine, but I cannot let them go as I have not agreed a price with the seller yet. Can you come back next week?" Six minutes.

"Yes, that offer is fine. Would you like a bag?" Four minutes. "Oh, and there are another three boxes of maps from the same source in the store room if you would like to look at them." Once in a lifetime, one just has to catch the later train. Four hours, thirty-two minutes and twenty seconds. Merry Christmas.

Book reviews

The Ordnance Survey and modern Irish literature, C  l  n Parsons, Oxford University Press,   55, ISBN 978 0 19 876770 1

This interesting book joins the extensive literature on the Ordnance Survey in Ireland. To quote from the blurb on the wrapper: ‘the book argues that one of the sources of Irish modernism lies in the attempt by the Survey to produce a comprehensive archive of a land emerging rapidly into modernity. The Ordnance survey instituted a practice of depicting the country as modern, fragmented, alienated, and troubled, both diagnosing and representing a landscape burdened with the paradoxes of colonial modernity. Subsequent literature returns in varying ways, both imitative and combative, to the complex representational challenge that the Survey confronts and seeks to surmount. From a colonial mapping project to an engine of nationalist imagining, and finally a framework by which to evade the claims of the postcolonial nation, the Ordnance Survey was a central imaginative source of what makes



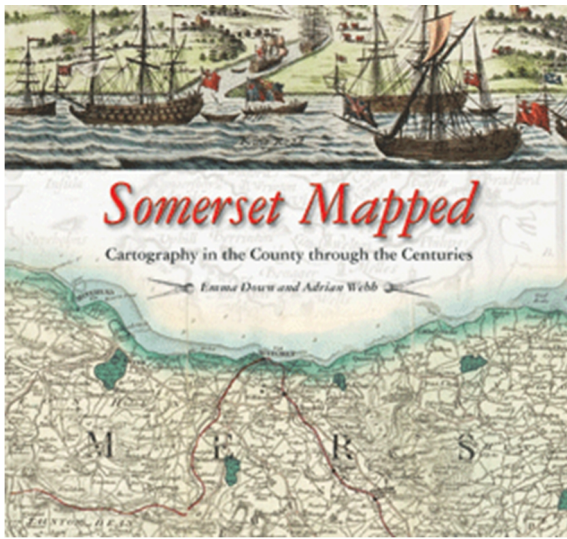
Irish modernist writing both formally innovative and politically challenging. Drawing on literary theory, studies of space, the history of cartography, postcolonial theory, archive theory, and the field of Irish studies, [the book] paints a picture of Irish writing deeply engaged in the representation of a multi-layered landscape.’

Five writers are considered in depth: John O’Donovan and James Clarence Mangan (1803-49: probably little-known to British readers), JM Synge, James Joyce and Samuel Beckett. O’Donovan and Mangan both worked for the Survey, on place-names and the ‘memoir project’ respectively; the chapter on Joyce and *Ulysses* is interesting, and would surely justify a monograph in its own right, but your reviewer remains unconvinced as to any substantial connection, even in spirit, between the Survey and Synge and Beckett. One difficulty is that the historical background is shaky: the Ordnance Survey of Ireland cannot be explained as a ‘colonial project’ – a unionist project, possibly, but that is not quite the same thing – and it is worrying when trigonometry and topography are apparently elided (e.g. on p.58). Thomas Colby, whose reaction to the shortcomings exposed in Britain in the early 1820s surely explains much about the practices in Ireland, not least place-name work, is mentioned a couple of times in the text, but finds no place in the index.

Altogether, this is a book to borrow rather than to buy: as with so many ‘academic’ works, the high price is likely to impede rather than facilitate the circulation of ideas, and general intellectual development.

Richard Oliver

***Somerset Mapped: Cartography in the County through the Centuries,*
Emma Down and Adrian Webb, Halsgrove, £24.99, ISBN: 978 0 85704 287 3**



Somerset Mapped is a real treasure of a book. From the earliest fourteenth century depiction of the county, known as the “Gough Map” to Brian Walker’s 1958 map “The West Country Revealed”, published by *Farmers Weekly*, the history and significance of maps is vividly explored and examined.

Maps represent a particular view of the world and this lavishly illustrated book traces the development of cartography in a fascinating way by focussing on one single county through the ages. There are thematic maps and charts, maps from tithe surveys, Elizabethan maps of the Mendips and wonderfully detailed town maps. There are sea charts, battlefield maps, plans for draining the turf bogs, maps for cyclists and many, many more, all arranged in chronological order. Together they illuminate the history of Somerset and help to bring alive the various mapmakers and the politics of the time.

The book is very sensibly laid out with a reproduction of all or part of the relevant map on the right-hand page and a description of the story behind it on the left. There are close-ups of parts of a map where these help to illustrate a point, and readers will find it useful to have a magnifying glass to hand for some of the finer detail. The original size of a map is given but it is not always possible to find a scale.

Despite its academic credentials this is a very readable book. Somerset has been my home for the past 40 years so I was naturally fascinated by the wide variety of reasons for which maps of the county have been produced. I was impressed by the beauty of so many of the cartographic representations; Collins’ chart of the River Avon from 1694 for example, includes a wonderful illustration of a ship sailing between rugged rocks, complete with oversized goats. The front cover of the book shows a reproduction of the scene at the mouth of the River Avon, again by Collins, included in his chart of the Bristol Channel. There are some unexpected depictions; Gerardus Mercator, best known today for his use of the map projection used on navigation charts worldwide, produced a map with west at the top and both the Mendips and what one assumes are the Quantocks in the wrong place. There are maps which include information in addition to the simple topographical detail; Emanuel Bowen’s map from 1720 states that the county contained 44,606 homes and “The Air is generally very good, unless it be in ye Marsh Country, where it inclines to Agues and other Distempers”

The first area of Somerset to be published by the Ordnance Survey was the western coastline, published in sheets in 1809, and the book explains how such early maps can be dated. The penultimate chapter of the book, “The Nineteenth

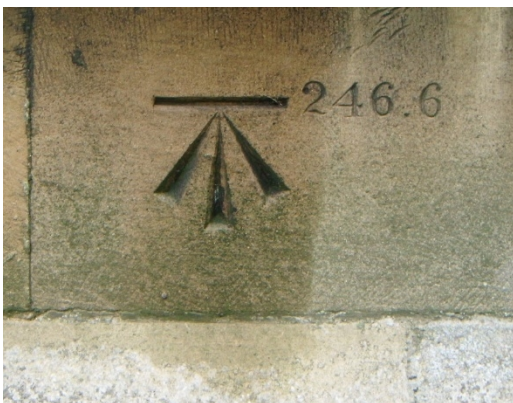
Century' is particularly fascinating; it illustrates the entrepreneurial skills of the time with publishers using OS detail to produce beautifully ornate maps with delicate colouring. The map issued by C & J Greenwood in 1822 cost £3 3s for Somerset and over £140 for a complete set of county maps!

A later favourite of mine is the Contoured Road Map of Bridgwater and Quantock Hills published in 1918, just after the First World War, to address the needs of those using maps for leisure, with cover showing a cyclist studying a map and planning his route across some glorious countryside.

Further into the twentieth century the maps become much more familiar to someone of my age and there are many interesting examples in the book. The World War Two Farm Survey undertaken by the Ministry of Agriculture and Fisheries, which used OS 25-inch sheets reduced to half size, helps to highlight the changes to the landscape today, with our housing estates, roads and retail parks. Also from that time, the War Office Geographical Section General Staff used Ordnance Survey mapping to produce a series of air maps for navigators, coloured to show different heights, with white tabs for significant spot heights and hazards such as explosive areas and H.T. cables marked.

Dr Adrian Webb currently manages the archive at the United Kingdom Hydrographic Office and Emma Down is a Map Specialist in the maps and plans department at the National Archives. Together they have expertly set the maps in the historical context of the events that gave rise to them. This book will be of great interest not simply to those who love maps and those who love Somerset but to anyone who enjoys the social history associated with maps through the ages. It provides a delightful insight into the ingenuity of cartographers and a colourful illustration of the artistry of mapmakers.

Dot Tinker



Would it not be better if the bench-marks on public buildings actually provided useful information to the passer-by rather than just being what to some is a mysterious symbol? Evidently the Rev Fernie, rector of Wellingore in Lincolnshire, thought so and expressed this view to the OS. A reply by a Capt Hussey survives among the parish papers in Lincolnshire Archives:

'Sir, I am desired by the Director General of the Ordnance Survey to send you the annexed particulars of the Ordnance Bench Mark on the Tower of your Church in compliance with the request contained in your letter dated 4th March 1885. ... the Bench Mark is 2.15ft above the surface of the ground, 246.6ft above Mean Sea Level, Liverpool.'

It is to be presumed that the rector arranged for the latter figure to be carved on the tower.

Rob Wheeler

Letters

I don't know about foxhounds,¹ but fish are definitely used in dogfood. My Airedale occasionally has 'Fish Treats'. He is not very keen on them, and they're not very nourishing, but they are probably not fattening.

Andrew Turner

I was interested to see, in the 'Mystery photographs'² a photo showing what looks like (the same?) Bramah Hydraulic Press which is now in Sheffield Industrial Museum, Kelham Island (below). I saw it earlier this year. The information displayed with it states that it was installed in the Tower of London to flatten maps in the early nineteenth century. It was moved to the OS premises in Surrey in 1874 and was in working order until the 1960s.

David Gulliver

[for more information about the Kelham Island Bramah press see *Sheetlines* 88,54 in the *Sheetlines* archive at www.charlesclosesociety.org/Sheetlinesarchive. Ed]



¹ Rob Wheeler, 'Stanford Hunting Populars', *Sheetlines* 106,42.

² Mike Nolan, 'Mystery photographs', *Sheetlines* 106,30.