



Sheetlines

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

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

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

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Annual General Meeting, 2002

The Ordnance Survey has kindly offered us the use of its new Business Centre for our 2002 AGM. Accordingly, the meeting will be held on Saturday, 18 May at the OS, Southampton, with formal business commencing at 12:00. This will be preceded at 11:00 by a talk: Peter Collier of the University of Portsmouth will speak on 'Photogrammetry in Britain, a tale of four Directors General: Close, Jack, Winterbotham, MacLeod'. After lunch, the map market will take place as usual, but with added competition: the OS has offered to open its shop especially for us. All in all it should prove an outstanding day.

R C Wheeler

Forthcoming visits

The next CCS visit is to the British Geological Survey, Keyworth, Nottingham, at 10:30 on Thursday, 7 March, 2002. A brief outline of the BGS will be followed by a tour (including the drawing office), lunch, an introduction to the library and a look at the map collection.

The visit to the Ordnance Survey office in Leicester, hosted by our member, David Andrews, will take place on Saturday, 20 April, 2002 at 10:00. David suggests an informal meeting, looking at surveying technology and techniques, and at office based intelligence systems (GIS etc). There will be an opportunity for further discussion after a pub lunch.

The Society visits Alan Godfrey Maps at Leadgate on Thursday, 13 June at 11:00. A pre-lunch tour will be followed by a camera demonstration and talk.

Places for any of these visits should be reserved with Gerry Jarvis, Rulow House, Buxton Old Road, Macclesfield, Cheshire, SK11 0AG, (01625) 611594, g0wgj@yahoo.co.uk.

Midlands Group meetings

At the initiative of Lez Watson, the re-convened Midlands Group has met twice in the congenial surroundings of the Age Concern Lunch Club in Burton upon Trent.¹

The first meeting, an open evening on 17 May, was attended by five members. The maps and discussion were wide ranging, including the 1:50,000 'Luton experiment' (which will be described in a future Sheetlines) and a carto-bibliographical curiosity in the Explorer series,

¹ At which no local CCS member is a regular attender – yet.

unravelling by the detective work of Rod Sladen. In the 2000 Trade Catalogue, the Explorer sheet projected to cover Holy Island and Bamburgh was numbered 336, but it was published in August 2000 as Sheet 340. The ISBN numbering for folded Explorer sheets comprises the OS code 0-319, the series code 21 and the sheet code (which for Explorers 298 to 346 is the sheet number plus 638), followed by the check digit. Thus Sheet 340 would be expected to have the ISBN code 0-319-21978-X, and this is what appears on the cover. On the map, however, is the code 0-319-21974-7. Evidently somebody at OS forgot that Sheet 336 had been renumbered 340. To avoid two sheets having the same code, the real Sheet 336 (*Biggar and Broughton*, published March 2001) was given an out-of-sequence ISBN number from a different range.

The second meeting, attended by seven members on 13 September, took as its theme Sheet 111. Rod Sladen tabled a comprehensive list of possibilities at 1:63,360, 1:50,000, 1:25,000 and 1:10,560 scales. Thanks to some adept interrogation of the Internet, he produced printouts of the six-inch first editions of Yorkshire sheet 111, mostly sea, with the cliffs of Filey Bay; Devon sheet 111, including Morwellham on the River Tamar, with a feast of detail for industrial archaeologists, and Lancashire sheet 111, the area south of Manchester, mostly rural 150 years ago, and including the site of William Hulme's Grammar School, where the 2001 AGM was held. The coincidence of sheet lines between one-inch small sheet series sheet 111 and New Popular/Seventh Series sheet 111 enabled comparison of a large part of the Peak District in 1895 and 1960. A fine copy of the quarter-inch map of "The Trent Basin showing the distribution of Long Barrows, Megaliths and Habitation Sites" was also on show, as it covers part of both sheets 111, and was too good to miss.

Bill Henwood

The Midlands Group of the Charles Close Society plan the following meetings for next year:

Thursday, 17 January 2002, with a guest speaker;

Thursday, 9 May: a 'seminar' on one-inch Popular District Maps;

Thursday, 12 September: open discussion session.

Meetings take place at 19:30 at Voluntary Services Centre, Union Street Car Park, Union Street, Burton upon Trent, Staffordshire (SK 246229). More information from Lez Watson, 54 King Street, Burton upon Trent, DE14 3AF, Leznlynnne@cs.com, tel: (01283) 541303.

Oxford Seminars in Cartography

Thursday, 21 February 2002, Hilary Turner: 'A wittie devise', the Sheldon Tapestry maps.

Thursday, 6 June, Susanna Fisher: 'More attractive and more useful'? English commercial chart publishing and the coming of the Admiralty chart.

All seminars commence at 17:00 in the School of Geography, Mansfield Road, Oxford. Further details from Nick Millea, Map Librarian, Bodleian Library, Broad Street, Oxford, OX1 3BG, nam@bodley.ox.ac.uk, tel: (01865) 287119.

*Visit to Kent to celebrate Mudge's map,
22 September 2001*

Barbara Jones

Mudge's Map of Kent, the first map produced by the Ordnance Survey, was published two hundred years ago this year. In celebration of this event seventeen members met at Ashford station at 10.00 am to see something of the area covered by the map.

First stop was at Ruckinge, passing through Hamstreet along the way. This latter village appeared on one of the set of stamps issued by the Post Office for the 1991 bicentennial of the Ordnance Survey, because its Post Office was the closest one to the north end of the base line laid out in 1786/7 across Romney Marsh. This base was used as a check for the triangulation to confirm the positions of the Greenwich and Paris observatories.

At Ruckinge we walked to the back of the churchyard. In the field beyond stood the stone in that marks the northern end of the base. Although a public footpath runs along the side of the field it was felt prudent, in view of the grazing sheep and the current sensitivity following the Foot and Mouth outbreak, to admire it from afar.

The stone, which has no inscription, was erected by the landowner after the 1991 celebrations which included a re-enactment of the base line survey. It stands on the spot where excavations in 1991 uncovered traces of iron and wood that were thought to be the remains of the wagon wheel and pipe used to mark the base in 1786. Stretching south to the coast was the flat land of Romney Marsh across which Lieut. Fiddes had established the base line. This alignment was praised by General Roy for having avoided every water hole and significant tree. The exact position of the south end of the base has been lost but was at High Nook (now High Knock) between St Mary's Bay and Dymchurch.

As we drove onwards, a photocopy of the strip map of the base line area, taken from General Roy's account of the Triangulation, was passed round, together with photos of the re-enactment and the Hamstreet stamp.

Stopping above the harbour on the eastern side of Folkestone we walked up to a Martello Tower that is open to the public. These towers were built at intervals along the coast as part of the Napoleonic War defences. The Kentish sites are marked in pencil on the OS surveyors' drawings from as early as 1794 but were not built until 1805 to 1808. From the top there was a magnificent view of Folkestone, the landslips on the cliffs to the east and the sea.

We were dropped for lunch at the east end of Hythe. Some went into town in search of eateries and others ate their sandwiches sitting the sun beside the Royal Military Canal that dates from the same period as the Martello Towers, and runs for 28 miles from Hythe to Pett Level, east of Hastings.

At 2.15 pm we all met up again at the Romney, Hythe and Dymchurch Railway station on the west side of Hythe. A holiday atmosphere now prevailed. The sun was shining; some of the group were enjoying ice creams and I think we were all excited at the prospect of a ride on a miniature steam train. Most clambered into the coach reserved for us but a couple of reckless souls paid 25p each to ride in the buffet car!

At New Romney, the penultimate station on the line, we disembarked but there was a reluctance to leave the platform until a second train, coming from Dungeness, had arrived and the keys for safe working on the single-track line had been exchanged.

The coach awaited and took us round the corner behind the railway line to the far edge of an estate of small bungalows. What did the residents make of a coach party trudging 400 yd across the shingle to stand staring inland across a disused gravel pit? We were looking at three large, experimental, concrete, acoustic mirrors built between the Wars to pick up the sound of approaching enemy aircraft. There were two round dishes 20 and 30 ft across and a curved wall 200 ft long. The enterprise was overtaken by radar and the site rendered unworkable by the noise pollution from various developments in the area.

The final visit of the day was to the Old Lighthouse at Dungeness. The nuclear power station, built in the 1960s, obscured this light and the new one stands further towards the sea. As a fitting end to the day a small bronze boss let into the floor of the Old Lighthouse parapet was identified as an OS marker.

At 4.45 pm the coach returned to Ashford Station. Thanks must go Gerry Jarvis for organising this trip and especially to Chris Board who did the research, worked out the itinerary and led the day with a wealth of information on paper and verbally. I am a fairly recent member of the Society and this was my first outing. If all trips are so well organised, informative, friendly and blessed with such good weather why was a fleet of coaches not required?

Visit to Tolworth: Defence Geographic Centre, 13 October 2001

Alan Fair

Around twenty members attended a most interesting afternoon at Tolworth. The maps provided to help us find our way there had no layer tinting, hachures or contours even, but were fine for their intended purpose whilst giving no indication of the cartographic treats in store.

Maggie Jacobs, Pete Jones and Dave Watt welcomed us and outlined the function of the DGC. Maps are provided to the Ministry of Defence and other government departments from a library of 540,000 maps. Paper maps continue to be in demand although digital information is becoming increasingly important. The Americans, who may maintain a larger map library, believe that Tolworth is the largest library of current topographic maps in the world!

Tolworth follow what was described as an aggressive acquisitions policy. Acquisitions account for 80% of the library's maps. Production of a map may be a thousand times the cost of acquisition. Close relations are maintained with foreign map agencies and maps are procured from diverse sources.

The problems of producing suitable maps to satisfy urgent military demand were outlined. The familiar problems of maps being out of date before they are published, the usefulness of current development being shown and the impact of non-availability were all discussed.

The foregoing combines to produce a most absorbing map collection of which we were clearly only able to scratch the surface. Examples we were able to drool over included experimental *Landranger* maps at a variety of scales, including 1:66,667. The Tolworth 57 Varieties, clearly assembled especially for us, embraced maps from all around the world,

including Greenland 1:200,000 (The most boring map in the world?) and an American map, 1:250,000 of Liverpool. (But is a relief model a map? Discuss!)

It remains to thank Maggie, Pete, Dave and their colleagues for giving up their time to make us so welcome and for answering questions with courtesy and patience – also for the provision of refreshments. Those attending were very grateful to Gerry Jarvis for organising the visit. I am sure all present, others too, will look forward to the next Field Trip.

This was a fascinating visit and the staff at Tolworth did us proud. The Editor had never hoped to wander round a defence establishment, wearing a pass proclaiming him to be V007! – CJH.

On-line gazetteers

Graham Bird

A member of the Guild of One Name Studies, Stephen Benham, has drawn my attention to two on-line gazetteers for Britain (i.e. excluding Ireland, North and South, and the Channel Isles). They are as follows:

<http://www.ordsvy.gov.uk/products/landranger/lrmsearch.cfm> searches placenames in the Ordnance Survey gazetteer, and returns the local authority area, grid reference, Landranger sheet number, and latitude and longitude.

<http://www.streetmap.co.uk/> searches both the Ordnance Survey and Bartholomew gazetteers, and links straight to maps covering any hits. Searches are possible on placename, street name, postcode, grid reference, telephone code, or latitude and longitude (although the telephone code results are a little strange). It is then possible to zoom in and out of the map, and scroll to adjoining maps.

As an example, the OS-only gazetteer returns Cade Street as being in East Sussex at grid reference TQ 6020, *Landranger* sheet 199, latitude 50° 57.7' N, longitude 0° 17.1' E. *Streetmap* returns a map showing the villages of Cade Street and Old Heathfield as just east of the Sussex town of Heathfield.

Stephen comments that the Ordnance Survey is a poor arbiter of the spelling of Welsh placenames. To be parochial, Llangynfelyn has historically been (mis-)spelt with practically every variation of Llan[g/c][y/a]n[f/v]e[l/l][y/i]n. OS still uses one of these anglicisations. More serious are their six Llanvihangels and three Llanvairs, which are lost to anyone searching on Llanfihangel or Llanfair.

If in doubt regarding a spelling, the best approach is to search only on those elements which it is possible to be sure of. The OS gazetteer will support a search of as few as two letters. In the case of Cade, 'ca' returns 6738 hits, 'cad' 188, and 'cade' 17.

The power of the press

Having two inches to fill on the last page of *Sheetlines* 59, I reported the owners' reaction to the OS description of a swimming pool. Sources now report the arrival of a very serious man from OS, grasping a cutting from *Sheetlines* and asking to see the 'pond'! – CJH.

Design and content changes on one-inch mapping of Britain, 1870 – 1914

Richard Oliver

In a recent discussion of the Ordnance Survey one-inch (1:63,360) New Series within the *ordnancemaps* Internet group, interest has focussed on both design changes and the dating of specimens with cropped margins; this latter theme is taken up by David Archer elsewhere in this issue of *Sheetlines*. I hope that it will be possible shortly to write more fully on the identification of ‘emarginate’ maps; meanwhile, it seems opportune to describe the design development of this mapping.¹ At first sight, the one striking change was the adoption of new symbols for the revised map, of which the first sheets were published in 1895; in fact, as will become apparent from this article, this was the culmination of a process which had been going on for a long time before.

The origins, development and some aspects of content of the New Series were described in these pages in 1982 and 1985, but for convenience some of this material (since refined by Roger Hellyer in his small-scale indexes volume) is repeated here.² The New Series, which covered England and Wales, and its Scottish equivalent were published in a variety of styles: here, attention will be concentrated on the content of the ‘outline’ editions, which were both engraved on and printed directly from copper plates and, by and large, are the most frequently encountered. (The ‘hill’ editions were usually identical in content; most of the significant variations are found in Scotland.) At the same time, most design changes affected both the New Series, which only covered England and Wales, and the separate, but broadly similar, one-inch mapping of Scotland, and so there is some discussion here of the latter, although there may be nuances which this Englishman has overlooked.

The development of the New Series and the one-inch of Scotland

The first mapping which is customarily treated as part of the ‘New Series’ was in fact published as the completion of what became known after 1872 as the ‘Old Series’.³ Sheets 91-110 of the Old Series (published 1847-74) were characterised by being derived from surveys made expressly for publication at 1:10,560 and larger scales, and therefore included field boundaries and other details not needed for the one-inch scale. In contrast, Old Series sheets 1-90 (published 1805-44) were based on surveys mostly at 1:31,680 with a view to publication only at one-inch. A further distinction was that all but three of the quarter-sheets in which ‘full’ sheets 91-99 and 101-110 were published were issued both in hachured (but uncountoured) ‘hills’ and countoured (but hachureless) ‘outline’ formats; hitherto only the hachured ‘hills’ style had been offered. Sheet numbering of both groups was south to north, in a ‘snake’.

In 1872 a replacement for Old Series sheets 1-90 was authorised. It was to be based on post-1848 1:10,560 and larger scale surveys, with sheet lines arranged as a continuation of

¹ I owe ‘emarginate’ to the late Guy Messenger.

² Richard Oliver, ‘What’s what with the New Series’, *Sheetlines* 5 (1982), 3-8; Richard Oliver, ‘New light on the New Series’, *Sheetlines* 12 (1985), 7-11; Roger Hellyer, *Ordnance Survey small-scale maps indexes: 1801 - 1998*, Kerry, David Archer, 1999, 8-27, 42-52.

³ This is discussed more fully in the introductory essay in Harry Margary, *The Ordnance Survey Old Series*, VIII, Lympne, Harry Margary, 1991.

those in northern England, on the Cassini projection with origin at Delamere. A first-fruit of this was that sheets 91-110 of the published maps were renumbered as sheets 1-73 of a 'New Series': thus at first this and 'Old Series' signified 'series of numbers' rather than differing specifications. There was a slight overlap between the completion of the 'Old Series' and the start of its replacement: New Series sheet 285 is dated January 1874, whereas the 'hills' version of Old Series sheet 100 (Isle of Man) is dated February 1874.⁴ The outline version of sheet 100, exceptional for its date in that it was published as a full sheet, with a map area of 864 square inches (about 5,579 sq cm), as compared with the standard New Series area of 216 square inches (about 1,395 sq cm), dated December 1873, was apparently treated as a New Series sheet from the start, and is the only published relic of a short-lived intention in 1872-3 to number the New Series as quarter-sheets from north to south rather than as separate sheets in their own right. (In the final New Series numbering, also arranged north to south, the single plate covering the Isle of Man was numbered as sheets 36, 45, 46, 56 and 57.)

After 1874, publication of the New Series proceeded rather slowly at first, as production of the one-inch of Scotland was in progress at the same time: the chronology of publication is given in the Appendix. What was in effect the 'first edition' of the New Series was completed at the turn of 1895-6. For convenience, this 'first edition' will be referred to here as NS-1; where necessary, the northern English sheets originally published with Old Series numbers will be referred to as OS-NS-1. Because of the progress of survey and re-survey, NS-1 excluded cover of Lancashire and Yorkshire and the Isles of Scilly; thus several sheets were published in 'incomplete' form. NS-1 was subject to a number of design changes, most of which only affected newly published sheets. In 1889 a modified procedure was adopted for engraving the hachures, which were in future to be on a separate plate, without any other detail, so that the hachured version of the map could be produced by overprinting the outline edition; by this means, topographic revision had only to be carried out on one plate (the outline) rather than on two.

The publication of the one-inch of Scotland was more straightforward: all sheets derived from 1:10,560 or larger scale surveys of 1843-78, and all were published in both 'outline' and 'hills' formats. Publication began in 1856, and the outline edition was completed in 1887. For convenience, this first edition will be called 'S-1'. Numbering was arranged south to north; initially a separate series of numbers was used for the group of seven sheets covering Lewis. The sheet lines were independent of those of England and Wales, being on the Bonne projection with origin at 57°30' N, 4° W, and certain design features differed, notably the much simpler border, the use of sans-serif italic for railway names, and 'Egyptian' for names of hills. (These distinctive treatments are also characteristic of the first Irish one-inch, published in outline 1855-62.) There are also sometimes, particularly on some later sheets, differences in style or minor content between outline and hills versions, notwithstanding that both derived from the same parent copperplate, which was subsequently duplicated by electrotyping: most S-1 hill sheets omitted parish boundaries and all omitted contours. Some features shown on S-1 have no counterpart on NS-1, because of administrative or ecclesiastical differences, but others show correspondence between the two, particularly the style of engraving, which was markedly finer on sheets prepared in the 1850s than it was by the early 1870s, when buildings, in particular, appeared much more generalised. There are also fairly close correspondences between some small innovations of

⁴ It should be noted that the dates of publication for particular sheets given in the official publication reports are often a month or two later than those stated on the maps themselves.

content in the 1880s on S-1 and NS-1, though the innovations may occur slightly earlier on S-1 than on NS-1. This may indicate that the ‘lead time’ for engraving Scottish sheets was often shorter than for their English and Welsh counterparts.

Although both the New Series and the Scottish one-inch were single national series, they were based on surveys which were carried out by county, and which did not proceed in an orderly geographical sequence. This had its effect on the pattern of one-inch publication, which is neatly illustrated by the situation in Scotland in 1860, with three groups of one-inch sheets published, for Galloway, around Edinburgh, and in Lewis. Survey by county, with one county completed many years before its neighbour was begun, could result in the publication of ‘incomplete’ sheets. Those of NS-1 omitting parts of Lancashire and Yorkshire have already been referred to.⁵ In 1880 incomplete versions were published of sheets 314 and 329, straddling the Hampshire-Dorset border, with the Dorset portion left blank; both were republished in complete form in 1893, as was sheet 95, which had been published in 1887 with the Caernarvonshire portion left blank. Several Scottish sheets were also initially in incomplete form: 13, 21, 98, 99; the last two waiting 26 years (1858-84) to be completed.

Although few sheets were formally published in incomplete form, engraving by county could result in more subtle inconsistencies within sheets. For example, on the Middlesex portion of sheet 269 workhouses are named in upright Roman; elsewhere on the sheet they are named in italic. This sheet was formally published in 1880, but here is evidence (by analogy with similar treatment on other sheets) that the Middlesex portion was engraved somewhat earlier than the remainder of the sheet. The Middlesex portion of sheet 255 had certainly been engraved by 1881, when it was used for an index to the county’s larger-scale mapping, but this sheet was only published complete in 1886. Sheet 224 was formally published in 1889, and is notable for parish churches being shown with their dedications in the Essex part but not in the Suffolk part of the sheet: as noted below, church dedications ceased to be shown on sheets published from late 1887 onwards, and there is thus some evidence that the Suffolk portion was engraved in 1887 or later. A characteristic of the sheets covering areas in Wigtown, Kirkcudbright and Lewis (published 1856-8) was the use of reverse italic for water names: this was revived in the early 1880s for the remaining sheets covering the ‘Long Isle’, presumably for reasons of stylistic harmony.

Between 1895 and 1899 all New Series sheets were republished in a second or ‘revised’ edition, based on a field revision of 1893-8: this included some striking design and content changes, notably affecting churches, postal facilities, railways and roads. These changes were the outcome of a War Office committee (the ‘Baker Committee’) on military mapping, and a Departmental Committee (the ‘Dorington Committee’) of the Board of Agriculture (responsible for the OS), both appointed in the spring of 1892. The Baker Committee made recommendations as to map content, and the Dorington Committee as to frequency of revision.⁶ For convenience, this edition will be referred to as NS-2. It included cover of those parts of Lancashire and Yorkshire and the Isles of Scilly which had not been published in NS-1, so that nine sheets published in 1896 (74-78, 83, 84, 87 and 357/360) were published from the first to the ‘revised’ specification.⁷

⁵ They were sheets 79-81, 88, 90 and 96-101; sheets 90 and 101 were later republished in NS-1 in ‘complete’ form.

⁶ *Report of committee on a military map of the United Kingdom*, London, War Office, 1892 [photocopy of uncertain provenance in writer’s possession]; *Report of the Departmental Committee appointed by the Board of Agriculture to inquire into the present condition of the Ordnance Survey*; BPP (HC) 1893-94 [c.6895], LXXII.305.

⁷ Sheet 357/360 was unique in that it was published in 1892 in a photozincographed ‘advance’ edition, but unlike all other such advance sheets, it was not replaced by a NS-1 engraved sheet.

Should these last nine sheets be treated as NS-1 or NS-2? Both Roger Hellyer in his indexes volume and this writer treat them as NS-2, on the grounds that they follow the distinctive specification introduced in 1895 for revised mapping, though the varying styles of publication note suggest that the OS themselves were undecided on the point. In 1900 Sir John Farquharson, lately retired as Director-General, referred to completion of the New Series 'in 1896', but it is unclear whether this is to be interpreted in a generational sense (NS-1) or a geographical one (replacement of all Old Series cover).⁸ A stylistic change which took effect in the autumn of 1896, and was carried out on sheets already published over the next eighteen months, was the adoption of a modified railway symbol, with double-track lines now shown by a 'chequer' effect. Publication of NS-2 was completed in August 1899; from March sheets had started to appear with 'Boundaries revised to December 1898'. This was in consequence of a provision in the Local Government Act of 1894 (best known for creating parish councils) which allowed county councils to propose alterations to parish boundaries until 31 December 1896: as a result, most of the earlier NS-2 sheets were affected, and underwent boundary revision.⁹

Revision of Scotland was undertaken in 1894-5, and published in 1896-8. For convenience, this edition will be referred to here as 'S-2'. It was generally similar in content and style to NS-2, except that contour lines were not re-engraved, and not all sheets used the new conventions for post offices.

A further field revision was undertaken between 1901 and 1912, and this was published between 1903 and 1913 as the 'Third Edition': this was the first time that the New Series carried any indication of 'edition' or generation. For convenience, the Third Edition will be referred to here as 'NS-3'. Compared with NS-2, there were very few obvious changes of design or content: a symbol was introduced for windpumps (which only appear on a minority of sheets), postal information was standardised in Scotland, and in 1909 symbols for railway stations and abbreviations for coastguard and lifeboat stations were introduced. In 1909 work began on a Fourth Edition (hereafter 'NS-4'), but only seven sheets were published in 1911-12 before work was abandoned. A single Fourth Edition sheet was published for Scotland (S-4).¹⁰ Stylistically, NS-4 and S-4 sheets are identical with later NS-3 and S-3 sheets. (The New Series copperplates were the basis of the Popular Edition of England and Wales and part of the New Popular Edition, but it is not customary to describe either as 'New Series'.) During World War I, and again from about 1936 onwards, NS-3, NS-4, S-3 and S-4 sheets were printed lithographically, rather than direct from copper.

Design changes

What follows describes the more obvious changes; it is not an attempt to reconstruct a complete specification. No such document is known for either the New Series or the one-inch of Scotland, and I doubt whether such a thing existed: precise specifications, enabling particular style and content to be replicated, only seem to have developed during the twentieth century. Nor are the reasons for the various changes discussed exhaustively.

⁸ Sir John Farquharson, 'Twelve years' work of the Ordnance Survey, 1887 to 1899', *Geographical Journal*, 15 (1900), 565-98: quotation on p.578.

⁹ Local Government Act, 1894 (56 & 57 Vict., c.73), sections 36 (13), 55.

¹⁰ Fourth Edition sheets published: New Series: 273, 274, 289, 290, 305, 306, 321. Scotland: 26.

Marginalia

Adjoining sheet names alongside map frame

These were standard from the start of 'southern' NS-1 publication in 1874; they were often added to OS-NS-1 sheets from the late 1880s onwards, and invariably to NS-2. They were not used on the Scottish one-inch.

Adjoining sheet numbers in border

These first appear on sheet 354, published in March 1891, and were standard on newly published sheets by the end of that year. They were often added thereafter to sheets already published, sometimes by cutting into the map frame rather than re-engraving adjoining sheet names. They were standard on NS-2, S-2 and later editions.

Altitude note

A note, 'The altitudes are given in feet above the approximate Mean Water at Liverpool, and are indicated thus (326)', was introduced to newly-published NS-1 and S-1 sheets in 1882, and was often added later to sheets already published. From the beginning of 1894, a longer note, referring to 'assumed Mean Level... which is 0.650 of a Foot below the general Mean Level', was used; this was standard on NS-2, S-2 and later editions. It was invariably placed below the scale bar.

Boundary revision notes

Acts of Parliament of 1876 and 1882 resulted in considerable tidying-up of detached portions of parishes in England and Wales. On some NS-1 (but not OS-NS-1) sheets this was duly reflected in revision of parish boundaries, with an accompanying note, placed bottom left. The 'Boundaries revised to December 1898' note on many NS-2 sheets is discussed above: it appears bottom right.

Copyright note

The note 'All rights of reproduction reserved' was added to all New Series and Scottish sheets published from 1888 onwards and was often added retrospectively to OS maps at all scales. As a result of the Copyright Act of 1911, 'Crown Copyright Reserved' was adopted instead, but this only begins to appear on one-inch sheets in 1913, and then only when republished or subject to correction.

County names in margin

These first appear on newly published NS-1 sheets in 1886, and were standard on NS-2, S-2 and later editions.

Directions in margin to or from towns

These first appear on NS-1 late in 1886, and were standard on newly-published sheets by late 1887. They do not appear to have been added to previously published sheets. They were standard on NS-2, S-2 and later editions.

Electrotype dates

The practice of taking an electrotype duplicate of a copper plate for printing sales copies, and replacing it when worn, began with the Old Series in the late 1840s: dating of electrotypes was introduced to NS-1 in 1862, but to S-1 apparently only in 1866. It was abandoned for

new electrotypes prepared after September 1892. Its introduction may have been to assure the customer that the mapping was ‘current’: its demise may have been due to the introduction of survey and railway insertion dates, but may also in some way be connected with the proceedings of the Dorington Committee.

Index diagrams

Small diagrams flanking the scale bar showing the numbers of adjoining one-inch sheets and of constituent six-inch sheets were a standard feature of S-1 from the beginning, but they only began to appear on NS-1 from 1873. From the late 1880s they were sometimes added to OS-NS-1 sheets. The standard size was about 0.66×0.44 inches (1.67×1.10 cm), but a smaller size, about 0.50×0.33 inches (1.27×0.64 cm) and cutting into the margin, was used on ten sheets published in 1876-9, and also on sheet 239, published in 1887, although the Middlesex part was certainly surveyed and may have been engraved substantially earlier. This seems to be associated with a smaller size of copper-plate and the placing of the scale-bar, discussed below.

Legend or conventional sign panel

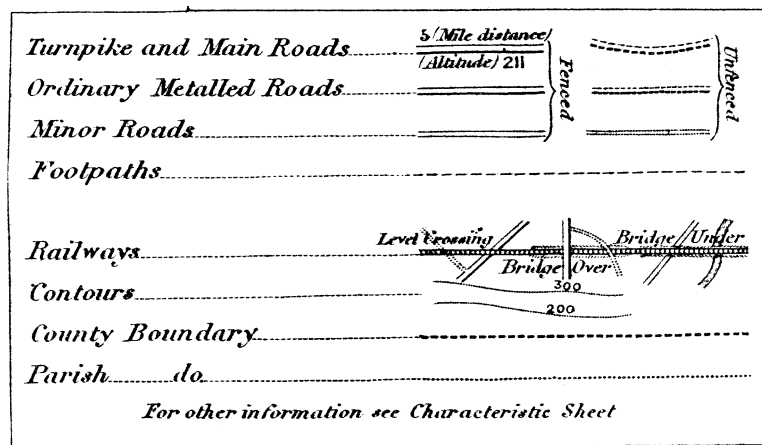


Figure 1. The early style of New Series [first edition] legend: from sheet 219 (1887).

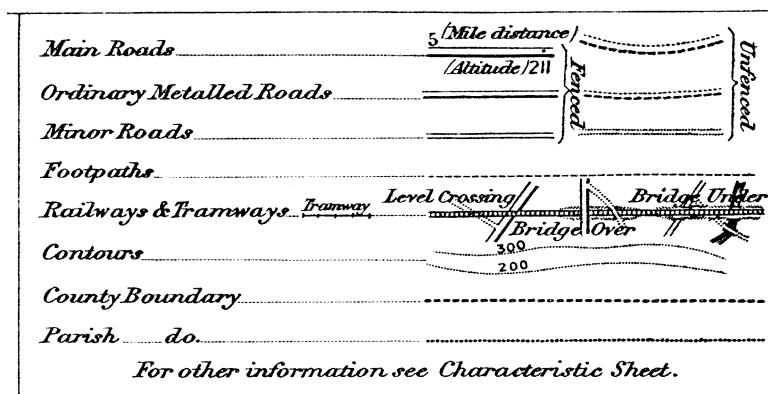


Figure 2. The final style of New Series [first edition] legend: from sheet 281 (1892).

A legend was first introduced late in 1886, on sheet 236. Each panel seems to have been engraved separately, but the only definite modification to content was the change in description from ‘Turnpike and Main’ to ‘Main’ for the highest category of road, on sheets

published from July 1892 onwards (Fig. 1.)¹¹ A few NS-1 sheets published before 1886 were subsequently provided with legends, but they are wholly absent from OS-NS-1 and S-1. On sheets published in 1886-7 the legend protruded to the left of the outer frame of the map; subsequently it was so aligned that the left-hand frame of the legend was aligned with the left-hand (west) neat line of the map.¹²

A completely redesigned and more informative legend was provided on NS-2 and S-2 sheets; on NS-3, S-3, NS-4 and S-4 this was modified to include a windpump symbol. On the earlier NS-2 sheets, published up to September 1896, symbols for lighthouse, lightship and beacon were included on sheets which included any foreshore; on other sheets this space was left blank. When post and telegraph offices started to be shown, from the autumn of 1896 onwards, the 'P' and 'T' were included in the blank space on inland sheets, and to the right of the legend on coastal sheets. (Fig.3A.) A similar practice was followed on Scottish sheets, except that where 'P.O.' was retained on the map, there was no reference to it in the legend.

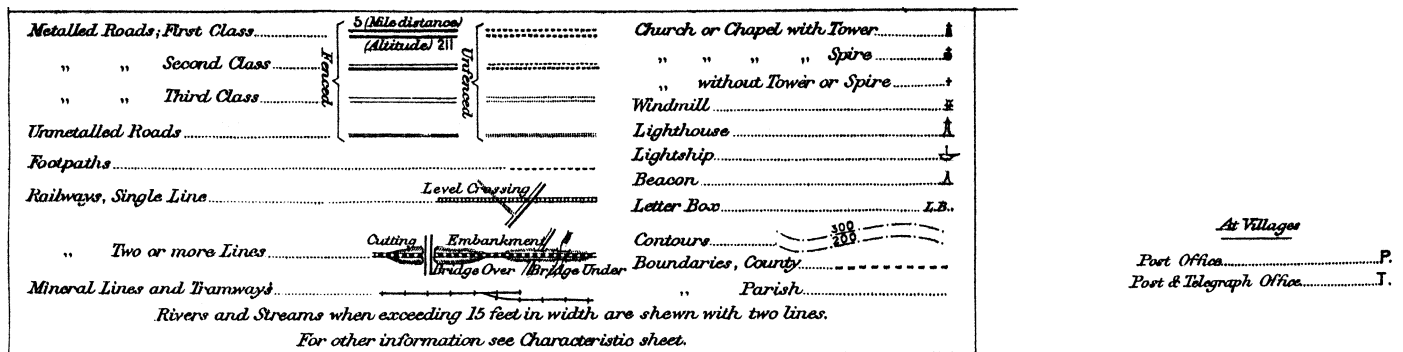


Figure 3A. Standard revised New Series legend for a coastal sheet: from sheet 273 (1894-5; this copy printed September 1901).

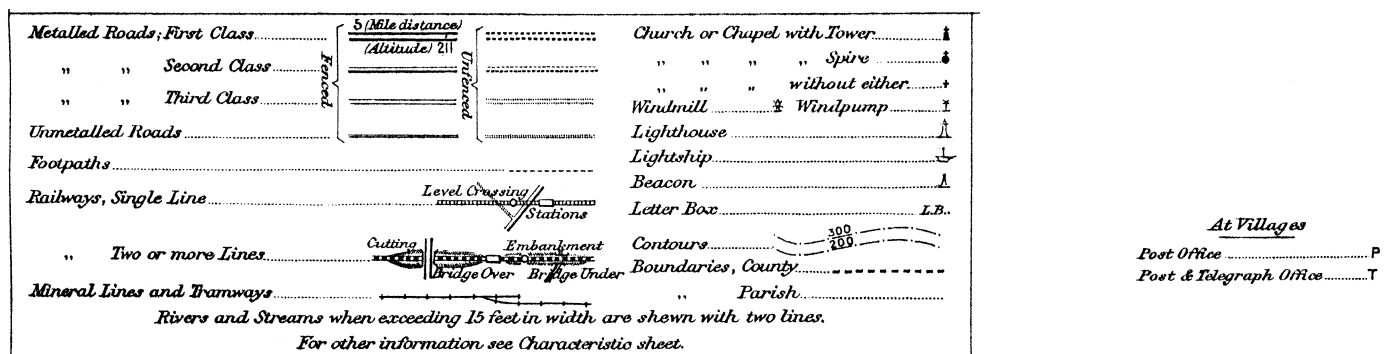


Figure 3B. Standard post-1909 New Series legend for a coastal sheet, with railway station symbols: from Fourth Edition sheet 273 (1911).

Minor correction notes

As exemplified by the case of Denny Island on sheet 264,¹³ minor corrections can be encountered on NS-1 sheets, but such post-publication revisions only began to be hinted at in

¹¹ Main roads were usually former turnpike roads: for a legal definition see Highways and Locomotives (Amendment) Act, 1878 (41 & 42 Vict., c.77), sections 13, 15.

¹² The legend was omitted from sheets 226, 275/291 and 354.

¹³ See 'An island lost and found', *Sheetlines* 27 (1990), 26-7.

the footnotes with the introduction of a ‘Minor corrections’ note late in 1909. The nature of such minor corrections on engraved New Series and Scottish sheets has not been explored thoroughly, except to say that (a few instances on NS-2 apart) they do not affect postal facilities (unlike on the contemporary coloured maps).

Names of places, etc, in border

Names of villages, etc, cut by sheet lines start to appear in NS-1 map borders in 1888, but only sparingly; they were sometimes added on NS-2 or NS-3.

Publication note

Engraved at the ORDNANCE MAP OFFICE, Southampton. The Outline by W. Newnam, the Writing by J. A. Harrison the Hills by _____ & Published by _____ Col. James R.E. F.R.S. M.R.I.A. &c. Superintendent Decr 1858

Figure 4A. Two-line publication note for an outline edition:
from New Series sheet 62 (Old Series 93 NW) (1858; this copy printed March 1898).

Engraved at the ORDNANCE SURVEY OFFICE, Southampton, under the direction of Captain Burke R.E. The Outline & Ornament by H. Baker, the Writing by A. Grandison. Published by Lieut. General J. Cameron, R.E. C.B. F.R.S. Director General, July 1878.

Figure 4B. Three-line publication note: from New Series sheet 286
(1878; this copy printed February 1893).

Engraved and Published at the Ordnance Survey Office, Southampton, in 1887

Figure 4C. One-line publication note: from New Series sheet 219 (1887).

Engraved at the ORDNANCE SURVEY OFFICE, Southampton, under the direction of Major C. R. Conder, R.E. The Outline and Writing by A. Newnam, the Ornament by E. W. Racine.

Published by Colonel Sir C. W. Wilson, K.C.B., F.R.S., R.E. &c. Director General, September 1892.

Figure 4D. Three-line (two-blank-one) publication note: from New Series sheet 281 (1892).

The usual form of publication note on NS-1 and S-1 included the names of the principal engravers responsible, the Royal Engineer officer nominally in charge of them, and of the Director-General (‘Superintendent’ up to the mid 1870s), and the nominal month and year of publication. On the earliest OS-NS-1 sheets this was on two lines, so laid out that the hill engraver’s name came in the middle of the lower line, making an inelegant effect on outline sheets (Fig. 4A). On NS-1 sheets published from the late 1850s, and on all S-1 sheets, a three-line style was adopted, which enabled the hill-engraver’s name to be discreetly omitted (Fig. 4B). This style was retained for all S-1 sheets, but all NS-1 sheets first published between 1882 and 1889 used a single line note, giving only place and date of publication (Fig. 4C). In 1890 the content of the three-line style was restored, but with a blank line inserted, to be used for the hill-engraver’s name on outline sheets overprinted with hachures (Fig. 4D), though in practice this was rarely done. The single-line note sometimes appears on later states of pre-1882 sheets, and a three-line note was added to one or two of the 1882-9 sheets.

A new style of three-line note was used on NS-2, S-2 and subsequent editions, giving initial survey and publication dates, followed by those for the current edition.

Railway insertion dates

These appear to have been introduced to all one-inch series in Britain in the summer of 1881. It should be noted that the date may apply either to a whole new line or lines, or just to a new (and cartographically inconspicuous) wayside station; on NS-2, S-2 and later editions it may occasionally apply to upgrading from single to double track. Railway insertion usually took place within a few months of a new line being opened; a conspicuous exception is the 'Quarry Line' avoiding Redhill in Surrey, which was opened in 1900, but which had still not been added to the NS-2 edition of sheet 286 when it was replaced by the NS-3 edition in 1904. It was unusual for non-passenger lines to be added: a notable exception is the addition of lines serving the new dock at Immingham on sheets 80 and 81/82 in 1911. Railway insertion notes do not usually appear on initial publications of sheets; thus that on NS-2 157 is anomalous.

Rights of way note

The note 'N.B. The representation on this map of a Road, Track, or Footpath, is no evidence of the existence of a right of way' was included on all one-inch maps published from 1889 onwards, and was often added to already published maps.

Scale bars

There are four separate groups of scale-bar placings, in relation to the south neat line of the map, on NS-1: (1) in the range 0.95-1.00 inch (2.41-2.54 cm), (2) slightly in excess of 1.00 inch, (3) around 1.15 inch (2.92 cm), and (4) 1.25 inch (3.18 cm) or more. Group (2) seems to have been the original standard, up to the mid-1880s; group (1) appears on a few sheets published between 1877 and 1887; group (3) appears on some published in 1887-8; and group (4) was standard from 1889 onwards. On NS-2 most, but not all, scale-bars in positions (1), (2) and (3) were re-engraved in position (4). Positions (1) and (2) seem to be associated with a smaller size of copper plate, but this needs further elucidation.

Series title and sheet number placing

The title 'Ordnance Survey of Scotland', top centre, was standard on the Scottish map from the beginning.

No series title was used on OS-NS-1 sheets as first published. The title 'Ordnance Survey of England' was standard on NS-1 from 1874 onwards, regardless of whether a particular sheet contained any part of Wales; 'Ordnance Survey of England and Wales' was introduced for sheets containing territory in the principality in November 1891 (a year after sheet 263, *Cardiff*, had been published with the shorter title).

On sheets first published up to 1882-3 the series title and sheet number were both so placed that they lined up with the map frame. This made for an inelegant effect when sheets were mounted together with their margins, and thereafter both series title and sheet number were indented, although sheets already published were only assimilated to the new style when republished in NS-2.

Sheet names

Sheet names first appeared on Old Series sheets with the publication of the first quarter-sheets in 1831, but they were so placed that they would be lost when the four quarters of a sheet were cropped for mounting together. The full-sheet names were omitted from OS-NS-1 sheets published in the later 1860s.

Sheet names, placed top right, were given on Scottish sheets from the beginning. They were a standard feature of NS-1 sheets from 1874, placed top centre, and, as with other post-1870 marginalia, were often added to OS-NS-1 sheets from the late 1880s onwards.

Submarine contour note

From 1889 to 1907 sheets showing submarine contours carried a note below the mean sea level note, giving the date(s) of Admiralty survey from which they derived. From 1907 the date element was omitted.

Survey dates

The first sheet to display a survey date was NS-1 sheet 172, published in July 1891. Thereafter they were standard on NS-1, being placed to the right of the legend. They were added to the zincographed ‘advance hills’ version of NS-1, but not usually to outline NS-1 sheets published before January 1891. On NS-2, S-2 and later editions the information was incorporated in the publication note.

The map proper

Churches

The practice on the Old Series was inherited from eighteenth century one-inch county mapping: it was to indicate Anglican parish churches only, by a cross. On OS-NS-1 sheets published from 1856 onwards the cross symbol was supplemented by the dedication of the church and the status of its living (rectory, vicarage, etc.). This style was retained on some of the NS-1 sheets published in 1876 (and possibly indicating the earliest sheets to be engraved), but otherwise the dedications were retained and the status of the living omitted on all sheets published up to 1887.¹⁴ On a few sheets published in 1886-9 both ‘Ch’ and ‘Church’ were used, but the standard style on newly-published sheets from 1887 onwards was ‘Ch’ and the cross symbol. With the introduction of symbols for steeples in 1895, ‘Ch’ in upright Roman was retained for Anglican churches, in addition to the symbol. Roman Catholic and ‘free’ churches were shown if they had steeples: the former were annotated ‘*R.C.Ch*’ in italic, the latter were left undescribed. Occasionally isolated free church chapels are indicated by description, without symbol.¹⁵

In Scotland, practice was always in principle similar to that introduced in England on NS-2, i.e. no dedications were given.

Contours

The first one-inch map to be contoured was Old Series sheet 91 SE, prepared thus in 1851 for the Great Exhibition. The interval of 25 feet and the variable size of dotting to indicate precisely and less precisely surveyed contours remained unique to this sheet (later NS-1 67). On all S-1 and NS-1 sheets first published up to 1889 contours were shown, usually at 50 ft, 100 ft, 100 ft intervals to 1000 ft, and thereafter at 250 ft intervals, by fine dotted lines (Fig. 1).¹⁶ On sheets published in 1890-91 a much heavier dot, apt to be confused with parish

¹⁴ Sheets with status of livings: 271, 272, 330, 331, 344, 345. Other sheets giving parish church dedications: 95, 96, 98, 107-111, 121, 222-224, 239-242, 248, 253-259, 268-270, 273, 274, 283-290, 299-306, 314-321, 329, 332-334.

¹⁵ For specific examples, see my notes to Alan Godfrey’s reissue of NS-3 sheet 90, *N.E. Lincolnshire 1906*.

¹⁶ On some OS-NS-1 sheets the 50 ft contour was omitted; as a result, NS-1 73 (Old Series 94 SE) appears to be uncountoured, as there is no ground over 100 ft on this sheet. The Isle of Man sheet was published without contours, as

boundaries, was adopted, but during 1892 the finer dotting was reverted to. A completely different style appeared on sheet 324 in December 1893, and was standard for newly published sheets from the autumn of 1894 onwards, of dots and long dashes. The dot-dash style was adopted as standard on NS-2, but with variations according to the contouring style of NS-1, and how readily it could be adapted to the new convention: sometimes there was a single dot between the dashes, sometimes several. The dotted style was not used on S-2 sheets, but it was standard on most S-3 sheets.

Footpaths

The distinction of foot and bridle ways seems to have been systematised on the large scales around 1884, with effects on newly-published smaller scale maps a few years later.¹⁷ On NS-1 sheets published up to 1884 and on all S-1 sheets footpaths seem to have been indicated, if at all, by double dotted lines: it is difficult, if not impossible, to distinguish these from the lowest class of minor road. Sheet 240, published in 1886, is unique in that it distinguishes bridle roads by 'B.R.'. The familiar single pecked line for footpaths was introduced on sheet 236, published late in 1886 (Figs 2 and 3).

Inns

Isolated inns which were presumably local landmarks were shown by their proper names on Old Series, S-1 and earlier NS-1 sheets. As with smithies, they are first indicated more generally on NS-1 sheets published from 1886 onwards, although the density varies from sheet to sheet; sometimes (e.g. on NS-1 sheet 144) none at all are shown. They were occasionally added to published sheets (e.g. 286, possibly in the late 1880s.) On NS-2, S-2 and later editions inns were apparently shown generally, with the proviso that where there was more than one at a village, only one was indicated.

Marine navigation aids

The practice on NS-1 and S-1 was to indicate lighthouses and beacons by description, and not to show lightships at all. A beacon is shown by inverted 'T' symbol on NS-1 273 (1878), and a large lightship symbol was added, perhaps experimentally, to a late state (early 1890s) of sheet 272. Symbols for lighthouses, lightships and beacons were all introduced with the other specification changes characteristic of NS-2 and S-2 (Fig. 3).

Parish names and boundaries, and 'parish village' names

The introduction of parish names and boundaries to the one-inch map was discussed in *Sheetlines* 38.¹⁸ Except on early states of the four quarters of Old Series 91 (NS-1 58, 59, 66, 67), they were a standard feature of the New Series and of the Scottish map in its outline edition. (They were also shown on some early (outline published 1856-8) S-1 hill sheets: on other hill sheets they are sometimes discernable as faint dots to guide the engraver who completed the outline version.) Up to the mid 1880s the parishes shown in England and Wales were ancient 'mother' ecclesiastical parishes, rather than their constituent townships or hamlets, which were later termed 'civil parishes'. In much of southern and eastern England ecclesiastical and civil parishes were co-extensive, but the opposite applied in

they were only surveyed for a small part of the island. The 25 ft contour was surveyed in Lincolnshire, and published on the New Series and, from 1905, on the half-inch (1:126,720) as well.

¹⁷ For further discussion, see Yolande Hodson, *Popular maps*, London, Charles Close Society (1999), 143-8.

¹⁸ Richard Oliver, 'One-inch Old Series map design in the early 1850s', *Sheetlines* 38 (1993), 19-26.

northern England. Civil parishes were shown on one-inch sheets published from 1886 onwards, but were very rarely added to previously published sheets: later states of NS-1 268, published in 1882, are unique in naming both ecclesiastical and (where different) civil parishes at the one-inch scale.

Parish names were shown on all S-1 and all OS-NS-1 sheets in open block letters. This lettering was used on NS-1 sheet 272 in its original, unpublished, form in 1872, but is absent from the published version of this and all other NS-1 sheets issued up to mid-1881. The open block lettering was then revived on the next seven NS-1 sheets to be published, in 1881-3, and was added to most of the sheets already published, presumably as new electrotypes were made.¹⁹ It is absent from sheet 242, the solitary NS-1 sheet published in 1884, and from all subsequent sheets. It is possible that the open block lettering was unobjectionable in the generally large parishes of northern England and Scotland, but was felt to make for a congested effect in some of the often much smaller parishes in the south-east. Civil parishes were shown on all sheets first published from 1886 onwards, and sans-serif capitals were used to name those civil parishes where the name differed from that of the village.²⁰ The usual practice on NS-1 was to name the 'parish village' in upright lower-case Roman, but on some sheets first published in the late 1880s on which civil parishes are shown (e.g. of Oxfordshire) the practice of the OS-NS-1 sheets is retained, i.e. the 'township' or 'civil parish' village is named in large lower-case italic.

On NS-2, NS-3 and NS-4 the standard practice followed that of later NS-1 sheets, i.e. either naming the 'parish village' in upright lower-case Roman, or else naming the parish in sans-serif capitals. However, it was much more usual on sheets 1-73 to retain the italicised 'township village' names on NS-2, and to re-engrave them in upright on NS-3.

The block letters were retained on all subsequent editions of the Scottish one-inch, and were imitated on its successor, the Popular Edition.

Post offices, telegraph offices, and letter boxes

Post offices are very occasionally indicated on the earliest (1856-7) S-1 sheets, and odd examples appear on sheets 45 (1876) and 53 (1877), and on NS-1 sheet 304 (1879). They were shown, by 'P.O.' in italic, on most S-1 sheets initially published from September 1882 onwards, and on most NS-1 sheets published between 1884 and 1890; the last uses of the convention seem to be on sheet 89 (1890) and the completed form of sheet 90 (date at present uncertain).²¹ The depiction of post offices appears to have been reasonably complete on later S-1 sheets, but patchy and idiosyncratic on NS-1, with sometimes only a single one shown (as on sheet 89, at a farm, an unlikely location that is nevertheless supported by the parent 1:10,560). A few letter-boxes (by 'L.B.') are shown on NS-1 sheet 109 and S-1 sheet 119 (1887). Post offices seem to have been indicated in their proper position, within the limits of scale and space for text.

The depiction of post and telegraph offices was recommended by the Baker Committee in 1892, but the earlier NS-2 sheets, published up to September 1896 only indicated letter-

¹⁹ Included on the initial publications of sheets 257, 258, 268, 283, 302, 317, 318; added later to sheets 256, 269-274, 284-290, 299-301, 303-306, 315, 316, 319, 330, 331, 334, 344, 345.

²⁰ Later states of sheet 268 are unique in that both 'mother' parishes in block letters and 'civil' parishes in sans-serif are shown.

²¹ Indicated on NS-1 sheets 89, 95, 97, 107, 109, 166, 175, 176, 190, 208, 222, 238-242, 255, 261/262; S-1 sheets 19, 27, 28, 35, 36, 43, 44, 51, 52, 58, 60, 61, 69-71, 79-81, 88-91, 99, 103, 113, 117, 119, 120, 122, 124, 126, 128-131.

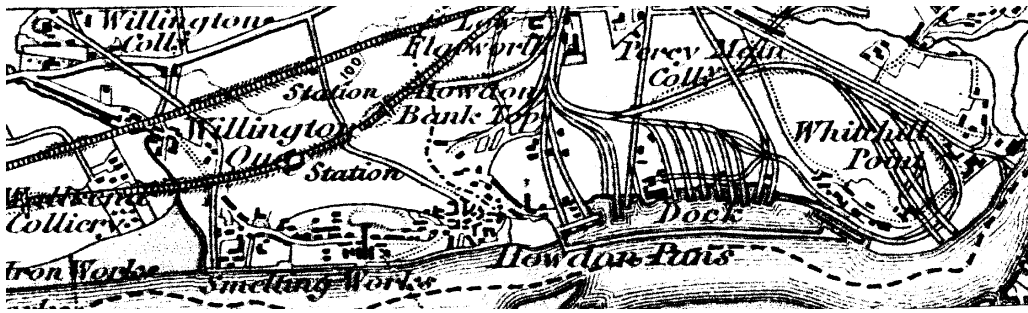


Figure 5A. Non-passenger railways at Percy Main: from New Series sheet 21 (Old Series 105 SE) (1865: this copy printed December 1886).



Figure 5B. The City and South London Railway on the surface: the 'underground' symbol on New Series sheet 270 (from a margin-cropped copy, 1890s).

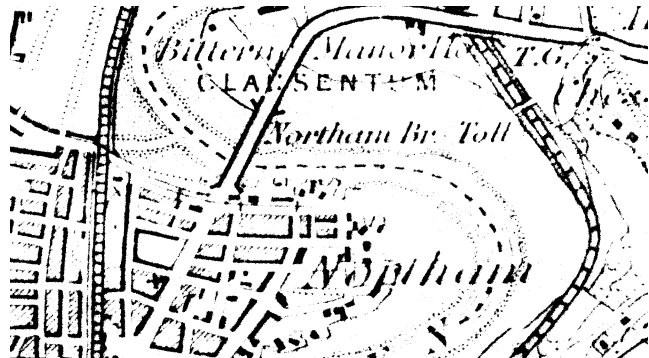


Figure 5C. The early conventions for railways on the revised New Series: close-spaced 'rungs' on the left for double track, wider-spaced ones on the right for single track: from sheet 315 (1895).

boxes.²² Thereafter, post and telegraph offices were shown by 'P' and 'T', placed below the name of the settlement in which they were situated, except for isolated telegraph offices, e.g. at railway or coastguard stations, which were indicated *in situ*. Post and telegraph offices were added later to NS-2 sheets published before the autumn of 1896. They rarely seem to have been revised after initial publication on a sheet. The treatment on S-2 sheets differed. On the earliest sheets they were either not shown at all, or else the old italicised 'P.O.' was retained; 'P' and 'T' were used on later sheets, but were apparently not added to sheets already published.²³ They were standard on S-3.

Railways: passenger and non-passenger, single and double

On all S-1 sheets and on earlier NS-1 sheets passenger railways were shown by a 'ladder' effect. Non-passenger lines were occasionally indicated by the same 'ladder' symbol, but more often they and 'tramways' were shown by parallel lines not always readily distinguished from ordinary roads (Fig. 5A). From 1886 the usual practice was to show non-passenger lines and tramways by a single-line-with-cross-bars symbol; from 1889 this symbol was added to the legend (Fig. 2). There are occasional instances (e.g. on sheet 121, published 1887) of both the old and new symbols being used on the same sheet as first

²² This applies to all the sheets using the earlier style of distinguishing single and double-track railways, listed in a note below.

²³ Sheets with 'P.O.' or 'Post Office': 19, 27, 43, 60, 70, 71, 73, 80, 82, 88-90, 92, 99, 102, 104-107, 114, 117, 119, 120, 122, 124, 126-128, 131. Sheets with 'P' and 'T': 4, 5, 7-10, 14-17, 20-26, 28-34, 36-41, 44-49, 52-57, 61-63, 65-67, 74-77, 84-87, 94-97. (On 30 and 84 they appear on the map, but not in the legend.)

published, and the new symbol was sometimes added to later states of sheets published before 1887 (e.g. at Tilbury docks on sheet 271). In the early 1890s a variation on the ‘tramway’ symbol, with close-spaced bars, was adopted for underground railways; this gave the impression that they were surface features, when in fact they were anything but (Fig. 5B).

Witnesses before the Baker Committee in 1892 asked for single and multiple track railways to be distinguished, and this was duly effected on NS-2. On sheets first published between March 1895 and September 1896 double-track lines were indicated by the ‘ladder’ symbol hitherto used for all lines, and single-track ones by a variation with more widely-spaced ‘rungs’ (Fig. 5C).²⁴ From October 1896 single-track lines were indicated by the ‘ladder’ symbol previously used for double track, and railways with two or more lines by a ‘chequer’ symbol (Fig. 3). The reason for the change of convention is unknown: it is possible that the earlier style was found to be insufficiently distinct. It would have been effected on the plates by deleting the surplus ‘rungs’ on single-track lines from the negative electrotype plate, on which engraved detail would appear in relief; this might have entailed some ‘making good’ on the subsequent positive plate on which new detail was engraved. The later convention would be effected by engraving the ‘chequers’, and there should have been no need for ‘making good’. The earlier NS-2 sheets were all converted to the new convention by early 1898. The later convention was used from the start on S-2.

Railway stations

On the earliest New Series sheets the usual style was to indicate all railway stations by lower-case Roman name or description. By about 1860, and on all S-1 sheets, it was usual for Roman to be reserved for terminus and other important stations, and for lower-case italic to be used for lesser stations, but unsystematic exceptions are sometimes encountered. This style was retained (with infrequent use of lower-case Roman) on newly-published NS-1 sheets up to 1887, when sans-serif upper-case was introduced for all stations, although the earlier style was retained for additions to previously published sheets. Sans-serif capitals were substituted for the earlier styles on NS-2, except on most sheets in northern England. From about August 1909 station symbols were introduced on newly-published NS-3 and S-3 sheets (and the two Fourth Editions), and names were only retained when they could not be deduced from a neighbouring settlement; the symbols were mostly small and not very legible (Fig. 3).²⁵

Road classification

The road classification on S-1 and earlier NS-1 sheets is not easy to understand: turnpike and ‘main’ roads were shown with one side of the road ‘shaded’, but subsidiary classifications are harder to determine. From 1886 onwards the classification shown on newly published NS-1 sheets was ‘Turnpike or main’, other metalled roads, unmetalled roads, and paths. The description ‘Turnpike or main’ became just ‘Main’ from July 1892 (Fig. 2). A few published NS-1 sheets (e.g. 286, first published 1878) were issued with the amended classification, which was often so engraved that the ‘main’ roads cannot be easily distinguished from the

²⁴ This convention was used on sheets 74, 78-83, 100, 203-208, 217-225, 235-242, 252-254, 257-259, 267, 269, 272-274, 283, 284, 286-290, 299-308, 314-323, 329-337, 344-348, 351-353, 358, 359.

²⁵ Station symbols used on NS-3 sheets 59-62, 66-70, 74-77, 83-86, 131, 132, 147, 148, 160-165, 177-180, 192/209-197, 210-214, 226-230, 244, 245, 337-340, 348-350, 355, 356; used on S-3 sheets 58, 59, 68, 69, 78, 79, 83-85, 88, 89, 93-95, 98, 99, 101-131. On many Scottish sheets, in particular, no railways appear on the map, and so the symbols appear only in the legend.

other metalled roads. Despite these improvements, OS road classification was strongly criticised by witnesses before the Baker Committee. As a result, the classification introduced in 1895 for NS-2 and S-2 sheets had three classes of metalled road (Fig. 3). These categories were used unchanged on NS-3, NS-4, S-3 and S-4.²⁶

Road mileages

Mileages along turnpike and 'main' roads had appeared on most Old Series sheets, but were not standard on NS-1 and S-1 sheets published up to the early 1880s. (Those on OS-NS-1 59 (Old Series 91 NE) and S-1 38 are significant exceptions, perhaps included for experimental purposes.) They were standard on NS-1 and S-1 sheets published from 1883 onwards, and were often added later to previously published sheets; otherwise, they were a standard feature of NS-2 and S-2 and later editions. They were based on milestones or mileposts already recorded on larger scale maps (and thus will be absent from roads not so furnished); mileages were given in one direction only, reckoning from the largest town. This could sometimes result in their being given in fractions: a notable example is on NS-1 sheets 90 and 103, on two roads from Louth (both part of the later A16).

Smithies

Smithies first start to appear on S-1 sheets published in December 1884 and on NS-1 sheets first published in 1886: like inns, they are shown in a fragmentary way. As with inns, on NS-2, S-2 and later editions they are shown apparently comprehensively, though, once again, where there were several in a village only one is indicated.

Submarine contours

Submarine contours first appeared on coastal NS-1 sheets published during 1889, and were standard on newly published sheets from 1890 onwards. They were added to coastal NS-2 and S-2 sheets as they were published.

Turnpikes and toll gates

In the 1870s and 1880s turnpike roads were in decline: as the trusts expired they were not renewed. Turnpike and toll gates were omitted from NS-1 sheets first published after 1887, although they continued to be shown on other NS-1 and S-1 sheets until they were replaced by NS-2 and S-2.

Windmills and windpumps

The depiction of windmills on OS maps between 1860 and 1914 has recently been studied at length by Bill Bignell, and what follows here covers only the barest outline.²⁷

On Old Series sheets 1-90 they were shown by pictorial symbols. A variety of symbols appear on a few OS-NS-1 sheets published in the late 1850s, but the usual practice from the 1840s to the 1880s was to indicate windmills either by description or else not at all. In 1878 a planimetric symbol (large black dot with 'X') was tried on sheet 273 and a pictorial symbol on sheet 274; from 1887 a standard pictorial symbol (probably produced by punching) was used, though annotation was retained on some sheets published in 1888-9, possibly indicating that their engraving had been started some time earlier. At this time windmills

²⁶ For further discussion, see Yolande Hodson, *Popular maps*, 127 ff.

²⁷ Bill Bignell, 'Conventional signs and the Ordnance Survey: the case of mills and the New Series', *Sheetlines* 35 (1993), 10-13; he has lately had examined a doctoral thesis at the University of Exeter on the same theme.

were regarded as having definite value as landmarks.²⁸ On NS-2 the windmill symbol was standard, and was used in three ways: annotated 'Windmill' (presumably to indicate a working mill), 'Old Windmill' (presumably one not working), or not at all (which often seems to indicate a windpump).²⁹ On NS-3 a separate windpump symbol was used (Fig. 3); where present, this is an infallible indicator on an 'emarginate' copy that it is later than NS-2, but the distribution of windmills and windpumps was concentrated in certain regions, and so this is not as useful as an indicator of edition as it might be.

Appendix – Chronology of the New Series and of the one-inch of Scotland

The references to sheets published are to the first appearance of a sheet, regardless of whether it was in outline or hills form. Up to the early 1870s it was more usual for the hill version to be published first; thereafter the outline edition usually appeared first.

- 1844 Work begins on Old Series 91 SW (later New Series 66).
- 1847 New Series sheet published: Dec: 66
- 1851 Future New Series sheet 67 prepared experimentally in contoured form.
- 1852 New Series sheets published: June: 67; Dec: 58, 59
- 1853 Work begins of one-inch of Scotland.
- 1856 New Series sheet published: July: 95. Scotland sheets published: March: 1, 2, 3
- 1857 New Series sheets published: Jan: 44; March: 54, 65; Sept: 68; Dec: 73; Scotland sheets published: Feb: 32; May: 4, 5; Nov: 41
- 1858 New Series sheets published: Jan: 64; March: 71, 72; May: 69, 70; Aug: 60; Nov: 62; Dec: 63; Scotland sheets published: July: 98, 99, 104, 105, 106, 111, 112
- 1859 New Series sheets published: April: 61; July: 52; Scotland sheets published: Sept: 7, 33
- 1860 New Series sheets published: Feb: 50; June: 41; Sept: 35; Oct: 40; Nov: 53; Scotland sheet published: Aug: 34
- 1861 New Series sheets published: March: 42; June: 34; Oct: 43, 51; Dec: 33; Scotland sheets published: March: 9, 40; June: 6; Sept: 8
- 1862 New Series sheets published: Jan: 32; Dec: 26; Scotland sheets published: Sept: 11; Dec: 26, 49
- 1863 New Series sheets published: Sept: 21; Oct: 31; Dec: 27; Scotland sheets published: March: 14; June: 22; Sept: 18
- 1864 New Series sheets published: Jan: 1, 2, 48; March: 25, 30; Oct: 39, 47; Nov: 20; Dec: 15; Scotland sheets published: May: 10; Sept: 15; Nov: 16, 24; Dec: 17
- 1865 New Series sheets published: March: 37, 49; April: 38; Nov: 3, 4; Scotland sheets published: Jan: 23; March: 25
- 1866 New Series sheets published: March: 24; Aug: 5, 19; Sept: 10, 11, 29; Oct: 7, 12, 13, 14; Nov: 8, 28; Scotland sheet published: March: 30
- 1867 New Series sheets published: April: 6; June: 9; Sept: 18; Nov: 23; Scotland sheet published: Jan: 31
- 1868 New Series sheets published: Feb: 16, 17, 22; Scotland sheets published: Aug: 48; Oct: 57
- 1869 Scotland sheets published: June: 39; Sept: 47, 55

²⁸ *Report of committee on a military map...*, 16 (question 14), 21 (question 90).

²⁹ How far this was in fact so is explored in the Bignell thesis.

- 1870 Scotland sheets published: Aug: 65; Sept: 13; Nov: 21; Dec: 56
- 1871 Scotland sheets published: Mar: 66; April: 67
- 1872 Work on sheet '76 SE' well advanced in early part of year. July: New Series formally authorised. Scotland sheets published: Sept: 77; Nov: 12, 46
- 1873 New Series sheet published: Dec: 36/45/46/56/57. Scotland sheets published: March: 63; Aug: 54; Sept: 29
- 1874 Adjoining sheet names introduced on New Series only. 'Ordnance Survey of England', individual sheet names, adjoining-sheet and constituent six-inch sheet diagrams introduced to New Series. New Series sheet published: Jan: 285; Scotland sheets published: Feb: 57A, 76; Nov: 64
- 1875 Scotland sheets published: Aug: 62; Sept: 95, 96, 97; Dec: 75
- 1876 New Series sheets published: Feb: 272, 330, 331, 344, 345; March: 270, 271; Sept: 316. Scotland sheets published: April: 84, 86; Aug: 87; Dec: 37, 45, 85
- 1877 New Series sheets published: May: 315; Nov: 256; Dec: 299. Scotland sheets published: Feb: 53; May: 74; Dec: 110
- 1878 New Series sheets published: July: 286, 288; Dec: 273, 274, 289, 290, 305, 306. Scotland sheets published: Feb: 103, 116; March: 38, 109; April: 115; Aug: 73; Sept: 94
- 1879 New Series sheets published: Aug: 287, 304, 320.
- 1880 New Series sheets published: Jan: 321; July: 284, 301, 314, 319, 329, 334; Aug: 269. Scotland sheets published: March: 108, 114; June: 72
- 1881 Railway insertion note introduced. New Series sheets published: Feb: 303, 332, 333; Sept: 318; Oct: 317. Scotland sheets published: Feb: 93; June: 102; July: 92, 107; Sept: 83
- 1882 Shorter altitude note introduced. Indented title and sheet-number and one-line publication note introduced on New Series. Post offices start to be shown on Scottish one-inch (September). New Series sheets published: 302; 259, 283. Scotland sheets published: Jan: 101, 113; April: 20; June: 82; July: 100; Sept: 81, 91
- 1883 Road mileages along main roads introduced as standard. New Series sheets published: 257, 258.
- 1884 Post offices start to appear on New Series. New Series sheets published: 242. Scotland sheets published: Jan: 90; Sept: 98; Dec: 50, 59, 68, 78, 80, 88, 99
- 1885 Scotland sheets published: Feb: 42; March: 118; April: 35, 43, 51; May: 58, 70; June: 79, 123; Aug: 19, 60, 69; Sept: 27, 28, 36; Dec: 61, 71, 89
- 1886 Legend, pecked footpath symbol, county names in border, marginal directions to or from towns, 'Ch' for parish churches, civil parishes, single-line-and-bars for non-passenger railways, non-landmark inns and smithies all introduced on New Series only. New Series sheets published: 85, 236, 237, 240, 241, 255. Scotland sheets published: Feb: 117; March: 44, 52; July: 125; Aug: 124; Sept: 122; Oct: 121, 127
- 1887 A few letter-boxes shown on New Series sheet 109 and Scotland sheet 119. Sans-serif capitals introduced for railway station names. Windmill symbol introduced as standard. Parish church dedications and turnpike gates omitted from newly published New Series sheets. New Series sheets published: 86, 95, 96, 97, 98, 99, 100, 107, 108, 109, 110, 111, 121, 122, 203, 219, 222, 223, 225, 238, 239, 248, 253, 254, 261/262, 358, 359. Scotland sheets published: Jan: 120, 128, 131; Feb: 126, 129; July: 130; Aug: 119
- 1888 'All rights of reproduction reserved' note introduced. Names of towns, etc, cut by sheet lines introduced in border on New Series only. New Series sheets published: 113, 132, 202, 221, 246, 247, 322, 335, 351.

- 1889 Rights-of-way note introduced. Submarine contours introduced (New Series only). New Series sheets published: 112, 123, 124, 126, 138, 142, 148, 160, 166, 174, 175, 176, 189, 190, 191, 208, 220, 224, 267, 323, 336, 346, 353.
- 1890 Three-line (two-blank-one style) publication note reintroduced on New Series. Underground railway symbol (close-spaced crossbars) introduced on New Series. New Series sheets published: May: 130; June: 80, 88, 131, 307; July: 81, 101, 147, 162, 252, 337; Aug: 89, 91, 125, 139, 146, 161, 206, 207, 218; Sept: 185; Oct: 90, 102, 156, 170, 308; Nov: 141, 171, 205, 263; Dec: 140
- 1891 Adjoining sheets numbers, survey dates introduced. Title 'Ordnance Survey of England & Wales' introduced for sheets containing Welsh territory (November). New Series sheets published: March: 354; April: 204; June: 201, 338; July: 104, 115, 129, 159, 172; Sept: 157, 173, 251; Oct: 103, 114, 128, 143, 188; Nov: 116, 145, 249, 250; Dec: 127, 144, 186, 187, 235, 264
- 1892 Reference to 'Turnpike' roads omitted from legend of sheets published from July onwards. Electrotypes and dates dropped (September). New Series sheets published: Feb: 137; March: 152; May: 158, 265; June: 342, 343; July: 169, 341, 355, 356; Sept: 234, 244, 245, 275/291, 279, 281; Oct: 155, 184, 200, 266, 280; Dec: 217, 229, 282, 296, 298, 327, 328, 349, 350
- 1893 New Series sheets published: July: 329; Sept: 276-278, 292, 340, 348; Oct: 314; Nov: 165, 198, 216, 233, 326, 339; Dec: 199, 215, 232, 297, 312, 313, 324
- 1894 Longer ('0.650') altitude note introduced. New Series sheets published: May: 194, 214, 325; June: 177; Aug: 151, 193, 196, 197, 231, 310, 311; Sept: 192/209, 210, 227, 228, 293; Oct: 178, 179, 211, 212, 294, 309; Nov: 150, 180, 181, 195, 295; Dec: 149, 230
- 1895 Revised New Series begins publication (March), with new symbols for roads, railways, churches and navigation features. New Series sheets first published: Feb: 168; March: 153, 154, 163, 167, 182; May: 164; June: 92, 117/133, 183; July: 134; Oct: 226; Nov: 119, 120; Dec: 93, 94, 105, 106, 118, 135, 136
- 1896 'P' and 'T' for post and telegraph offices introduced; railway conventions changed, including adoption of 'chequers' for multiple-track lines. New Series sheets first published: May: 74; June: 78; July: 83; Oct: 75, 77, 87; Dec: 76, 84, 357/360.
- 1899 (March) Revised New Series sheets start to appear with boundaries revised to December 1898; (August) Revised New Series completed.
- 1901 'Second National Revision' begins in England and Scotland.
- 1903 Publication of 'Third Edition' begins in both England and Scotland: windpump symbol introduced.
- 1907 Date of submarine contour survey omitted.
- 1909 August: introduction of station symbol. 'Minor corrections' note introduced. Work begins on 'Third National Revision'.
- 1910 Second National Revision of Scotland completed.
- 1911 Publication of 'Fourth Edition' begins.
- 1912 Publication of 'Third Edition' of Scotland completed; publication of 'Fourth Edition' abandoned. Second National Revision of England and Wales completed.
- 1913 'Crown Copyright Reserved' note introduced. Publication of 'Third Edition' of England and Wales completed.
- 1915 (January) Last known dated correction of an engraved New Series sheet (256).
- 1920 (January) Price of engraved New Series sheets increased from 1s. to 2s.

Additions and corrections

John Cole

'The Ordnance Survey 1:1250 National Grid Surveys : an updated list', Sheetlines 56, p 14.

To 'Motherwell: (Hamilton)' add 'and Wishaw'. In addition to the locations given, Stenhousemuir should be included in the map total for Falkirk and Grangemouth.

'Passing by', Sheetlines 58, pp 14 – 16.

Attempts to deduce dates of revision for Dorset, Hampshire, Wiltshire, Staffordshire and Northumberland, to make the provisional list of bypassed plans more complete, were only partially successful, but since more recent information is still at best vague, results are mainly generalised.

In Dorset approximately seventy plans were revised in 1923-4, forty in 1926-8, three (including ST 9500 and 9600 misprinted 1924/6-38) in 1934-8 and the remainder 1900-01.

For Hampshire a more realistic revision date appears to be 1922-4 and Wiltshire 1926-8. Many plans were probably a mixture of revision dates e.g. part 1900, part 1928. For Northumberland, OS quoted 1916 for NZ 2794, and 1938 for NZ 2694 and 2793.

The total for Staffordshire is reduced yet further as SJ 8259 and SJ 8558 are in fact in Cheshire. Two further Cheshire plans, SJ 8256 and SJ 8355, were possibly bypassed and a revision date of 1916 seems probable, this date also applying to SJ 8259.

For Warwickshire the missing revision dates are almost certainly 1936-7, whilst the deduced dates for Leicestershire would appear to be reliable.

'Tunnel vision II', Sheetlines 60, pp 34 – 36.

The remarks about sheet 96 refer to the New Popular edition; the Seventh Series sheet has not been examined. Braunston and Crick Tunnels also appear on Seventh Series sheet 133.

Missing also from New Popular and Seventh Series sheet 131 is the name 'Wast Hills Tunnel' on the Birmingham and Worcester Canal. However the name 'Wast Hills' is in very close proximity and the tunnel itself is variously known as Kings Norton and West Hill.

Omitted from my article were Campden Tunnel (New Popular and Seventh Series sheet 144, and 1:50,000 sheet 151: railway, 887 yards) and Norwood Tunnel (New Popular and Seventh Series sheet 103: canal, 3102 yards).

Following on from Phil Clayton's remarks in *Sheetlines 61*, even if not named, the description 'disused' should certainly have been applied to at least four or five other long canal tunnels besides Lapal. Norwood itself was closed in 1908 and the Chesterfield Canal abandoned west of Worksop as a consequence. Others (with dates of closure) include Sapperton, 1911; Oxenhall, 1881 (though as a concession this is annotated 'Old Tunnel' on the Seventh Series); Butterley, 1900 and possibly Berwick, after 1921.¹

'1:2,500 National Grid resurvey and revision in the replotted counties', Sheetlines 60.

Page 25, penultimate line: After '2000 km²' insert 'out of a national total to date of 31,000'.

Page 27, line 14: after 'Some' insert 'National Grid'.

¹ One inch maps 157, 143, 111-112 and 118, respectively.

The quarter inch to one mile (1:253,440 scale) topographic map of Great Britain, 1945 – 1960:

A temporary map which outlasted its usefulness

Christopher Board

Introduction

This comparatively neglected map series was obviously a temporary issue. A seasoned cartographer recently told me that this map was old fashioned and hard to read even when he first bought a set of them to cover the entire country in about 1946. The dates of full revision of the detail vary from 1915 to 1930 for England and Wales, and from 1923 to 1928 for Scotland. This was even printed on the front covers of folded maps but with the addition of the words 'with later corrections'. Due to lack of resources and the understandable pressure to revise large-scale mapping and the one-inch map (1:63,360) from which the quarter-inch map was derived, the life of this series was extended several times until finally replaced by a completely redrawn map at the scale of 1:250,000 in the 1960s. With the help of incomplete archives now in the Public Record Office and Cambridge University Library, combined with a study of the maps themselves, the last chapter of an official map established in the 1890s can be written. However it will be seen that the 1:250,000 series, which was dubbed the Fifth Edition of the quarter-inch map, was clearly regarded as a version of the older map, but in a new style.

Prior to the Second World War the standard Ordnance Survey motoring maps were those at the scale of 1:253,440. The ninth edition of *A Description of Small Scale Maps* (1937) mentioned their usefulness being 'greatly increased by the re-arrangement of the sheet-lines, and by showing Ministry of Transport road numbers and classification'.¹ These were the Fourth Edition at that scale and carried a newly devised grid of squares 10,000 yards by 10,000 yards. In an attempt to set out a programme for the Ordnance Survey (OS), which had been desperately trying to revise increasingly out of date mapping in two decades marked by limited resources and remarkable expansion of suburbs outside most cities, the Davidson Committee appointed in May 1935 by the Minister of Agriculture to whom the OS answered, reported in February 1938.² Even while the committee was deliberating it was recognised that the quarter-inch map needed redrawing but that it could not be considered apart from the one-inch and half-inch maps.³ It recommended no change in the range of small scale maps, but did recommend that a grid based on the international metre be superimposed on nearly all OS maps. The Committee noted that the quarter-inch map was revised in step with the revision of the one-inch map. In so far as the one-inch maps of the late 1930s had been fully revised, chiefly only in the south of England where a new edition of the one-inch map was being introduced and in Scotland in the 1920s, the quarter-inch map could consequently benefit from this revision. However the production of the quarter-inch map on a new projection which involved some photographic adjustment took priority over the revision from

¹ Ordnance Survey of Great Britain, 1937. *A Description of Small Scale Maps*, ninth edition. Southampton

² Ministry of Agriculture and Fisheries, *Final Report of the Departmental Committee on the Ordnance Survey*. Chairman, Viscount Davidson. HMSO. 1938, reprinted 1946.

³ Public Record Office (PRO) OS 1/54. 1932-1939. 1/4" Map Series.

more recent one-inch mapping. The Committee optimistically considered that the revision of maps derived from the one-inch map had not lagged far behind development (i.e. change of use to built-up land) and recommended no change in procedures which entailed complete revision every fifteen years.

By May 1939 the Director General OS decided that a metric grid should not be added to the quarter-inch map until it had been added to the one-inch maps from which it was revised.⁴ He also mentioned the possibility of changing the scale from 1:253,440 to 1:250,000 but deferred a decision on this until redrawing the quarter-inch map came up for consideration. Some trials were carried out with one map (*England and Wales*, 7) with a metric grid and with varying colours of contours. The file then falls silent until March 1944, when it was decided to keep the grid separate from the detail to allow for the production of gridded and ungridded editions.⁵

Production of the quarter-inch map with National Grid

The new Director General, Brigadier G Cheetham, revealed OS planning for the near future noting that the quarter-inch map was to be published in the same format as before the war, but with a metric grid 'revision carried out before and during the war is being incorporated'.⁶ Part of the justification for producing a new version of the quarter-inch map was the requirement to make the military edition with a War Office Cassini grid available for Scotland in early 1944. Similar sheets for England and Wales were made available in July 1944. These were described in the OS unpublished annual reports as 'War Revision' and from the evidence of a single sheet (E&W 6, *North Midlands and Lincolnshire*) were issued in plain card covers priced 3/- mounted on linen. The unpublished OS annual report for 1944-45 reveals that a start had been made on the new fourth edition of the quarter-inch map but little progress had been made.⁷ All the original negatives for the series had been destroyed by enemy action, but could be reconstructed from prints made from the original negatives on white, enamelled zinc plates which had been stored in a secure place. Two of the eighteen sheets covering Britain appeared in 1945, the rest in 1946. The sale prices printed in the margin of the earliest editions were cancelled by a label printed in blue giving new prices from 1 September 1945. Only sheet 11 was published before that date. More precise dates of publication can sometimes be obtained from the OS's monthly Publication Reports. In December 1946 Cheetham wrote to the Deputy Director General to congratulate the staff on the almost complete production of the new map, particularly for the preparation and reprinting of the layer (relief) plates which very successfully kept an even tone from sheet to sheet allowing the maps to be assembled as a general wall map.⁸

This metric gridded map was never intended to be more than a stop-gap until it could be replaced by a newly designed map which was easier to read and less crowded than its pre-war predecessor. That its life was prolonged until the early 1960s was mainly due to the long and sometimes interrupted gestation of the Fifth Edition. So intertwined are the stories of the

⁴ PRO OS 1/382. 1939-1951. 1/4" to 1 Mile Map with Metric Grid 4th Edition Great Britain. Minute 2. 25/5/1939

⁵ PRO OS 1/382. 16A. 28/3/1944

⁶ Cheetham, G. 1946. 'New Medium and Small Scale Maps of the Ordnance Survey'. *Geographical Journal*, 107 (5&6) 211-224. Read to the Society, 10 December 1945.

⁷ Ordnance Survey Annual Report for 1944-1945. Unpublished.

⁸ PRO OS 1/382. DGOS to DDG OS.17A. 14/12/1946.

two editions that one sometimes stumbles across insights into ways in which the earlier edition was compiled, produced and published.

Folded maps continued to be published in long, Michelin type format. Maps were sold unmounted and flat, unmounted and folded, mounted and folded and dissected, then mounted and folded, all in standard covers following a design established before the war. In January 1947 customers were warned that mounting cloth was in short supply and that orders for paper folded would be dealt with more quickly. Such shortages continued to plague this series in 1947 and occurred again in 1951. While plans for the Fifth Edition originally retained the Michelin fold, criticism by users caused a rethink in favour of the Bender fold.

New roads built in the late 1930s and areas of suburban expansion can be detected, for example, around Portsmouth as well as in the major conurbations. Although the original editions had no town plans (traffic diagrams) they were tipped into the folded maps from 1948 onwards. These were never revised and were finally removed in the late 1950s, although there were plans to continue to provide such plans on the Fifth Edition. There was also an outline edition in black, or black and grey, only which omitted all the classification detail for roads.

The chief difference between the National Grid version and the original edition lay in removing the faint buff colour from the layer below 200 feet (61m) and the lightening of the graded buffs and browns in the higher layers. The layer scheme for the new series of maps was simplified when compared with that on the original version of the Fourth Edition.

<i>Original layer scheme</i>	<i>National Grid version</i>
3600ft	
3200ft	
	3000ft
2800ft	
2400ft	
2000ft	2000ft
1600ft	
	1400ft
1200ft	
	1000ft
800ft	800ft
600ft	600ft
400ft	400ft
200ft	200ft

Changing from the yard to the metric grid and the addition of information in the margin by way of explanation was effected in exactly the same style as on the original edition. Following a period of consultation with motoring and cycling organisations and others a start was made on redesigning the map so that it could be redrawn as had been intended since before the war.⁹ Three experimental schemes survive, two of which were based on the previous Third and Fourth Editions. The other one follows improvements made on the post-war National Grid version, but on one of them the road widths are more distinct and clearer. All the place names and other lettering are larger and easier to read. However, more pressing issues, e.g. the large-scale programme, supervened and hardly any small-scale products feature in the OS Monthly Publications lists for 1950 and the first half of 1951.

⁹ PRO OS 1/426. 1947-1949. 1/4" Regular Series Design. This file contains minutes and colour proofs of different design options for a redrawn series of maps at the quarter-inch scale and begins in mid 1947.

Despite the amount of work devoted to the design of a Fifth Edition, which had taken place from the summer of 1947 to the end of August 1949, the project seems to have put ‘on hold’. That this coincided with Brown’s arrival as DG may be fortuitous, but Seymour credits him with instituting the practice of codifying OS policy in policy statements.¹⁰ It was left to him to clarify OS policy and to establish a system of decision-making from what appears from the files to have been a relaxed approach to designing the new quarter-inch map, as the Fifth was then called. In November 1950 the Directorate of Military Survey submitted a long memorandum to OS on ways of improving the map for users.¹¹ By the end of 1951 the Director Map Production approved changes to the way in which the grid values were given in the northern and southern margins by turning them horizontal and by simplifying those values by eliminating small redundant figures. At the same time the elaborate magnetic variation diagram was simplified to show only the difference between Grid North and Magnetic North, which was required by users. Other details were relegated to a text description, where the year of the magnetic variation provided the only reliable way of dating the printing. These improvements begin to appear on maps printed in 1952.

Imprints have changed several times. The initial ones indicate the hundreds printed, year and the place where printed, e.g. 20,045/Ch (20 thousand, 1945, Chessington). From January 1947 so-called unique numbers were allocated to the entire series. New four digit numbers were given to new editions. From 1952¹² a new system of indicating editions was extended to the each map (e.g. E, E/ or E//) in which a change of letter represents what the OS regarded as a new edition, the lines beneath the letter indicates some minor corrections.

The first major change in content was made in 1949 on Scotland sheet 4, when it was extended to include the southern ends of the Kintyre peninsula and the Isle of Arran. This was very much for the convenience of those in those areas who looked to Glasgow as their main centre for business. This was reported as being ‘in hand’ in the unpublished OS Annual report for 1946-47.¹³ We are fortunate to have a record of the sales figures for each sheet of the quarter-inch map in 1949, broken down by type of mounting. Out of a total of nearly 60,000 sold, over 80% were the eleven English and Welsh sheets. Perhaps somewhat surprisingly, 73% of the total were mounted and folded. Presumably the data were collected to help decide the size of print runs. The details will be found in Appendix 2.

Change in the detailed content of the minor road pattern began to take place from 1951. It is most noticeable on England & Wales sheets 10 and 11 where there had been a dense network of minor roads, lanes and tracks many of which were present on the original editions published before 1900. Figure 1 illustrates the effect of clearing the excessively detailed base for a portion of North Devon and compares it with the road patterns in the preceding editions.

So far there are no clear indications of why this major improvement to the legibility of the map took place then. All sheets were subject to some degree of clearance. It is most likely that the two sheets most affected had been modified by duffing out roads not wanted on a redrawn new series that had been planned since 1947 but ‘put on ice’ while other more pressing tasks were carried out. Overhead transparencies which were intended to accompany the presentation of this paper show the extent to which roads were deleted from the detail

¹⁰ Seymour, W, *History of the Ordnance Survey*, Folkestone, Dawson, 1980. p.299.

¹¹ PRO. OS1/382. 26. Memorandum by Military Survey 22/11/1950

¹² Oliver, R R, *A guide to the Ordnance Survey one-inch New Popular Edition*, London, Charles Close Society, 2000, says that the edition letters for small scale maps were introduced in April 1953. If this is correct, it would indicate that the maps whose Magnetic Variation details are dated 1952 were not published until 1953.

¹³ Ordnance Survey Annual Report for 1946-1947. Unpublished.

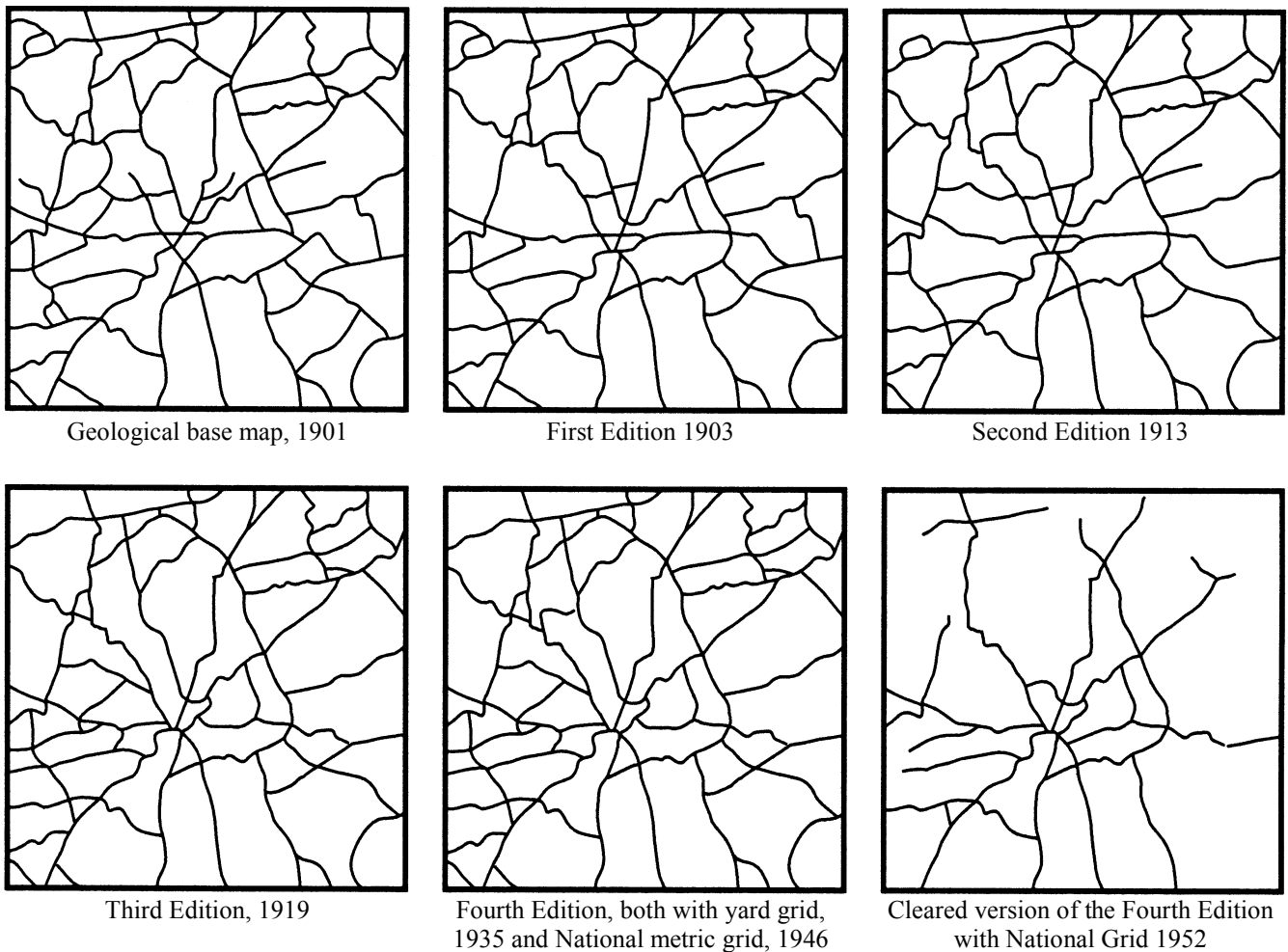


Figure 1. The pattern of roads around Holsworthy, Devon, depicted on editions of the quarterinch maps of the Ordnance Survey between 1901 and 1952. Original scale 1:253,440. Each square represents 10km by 10km.

and, to a much lesser extent, where new roads had been added. After experimentation, laser-printed copies of the cleared, or later states of the map were printed on acetate sheets in royal blue. When superimposed over the uncleared, original edition the degree of change was comparatively easy to observe and record. This is preferable to side by side examination of each grid square, although for some purposes this also has to be done e.g. when looking for railway station closures.

It can be concluded that typically of OS practice they had begun preparation for a new, clearer series of the quarter-inch map on sheets in southern England. A relatively small amount of change in the minor road pattern can be detected on most of the other maps in the series from 1951. Close study reveals that the resulting simplified minor road pattern corresponds with those roads under fourteen feet of metalling which are of good quality on the one-inch maps of the New Popular Edition published from 1945 onwards. Such wholesale clearing of minor roads below this category is confined mainly to sheets England & Wales 10 and 11. It is possible that the full revision of roads in these areas had been undertaken before and during the war. Examination of the most recent states of the Fifth Series in the Holsworthy area rules out a straightforward connection between the classes of road and those omitted when sheet 11 of the quarter-inch map was cleared of detail. Oliver's

discussion of the depiction of roads under fourteen feet wide on the Fifth Edition of the one-inch map points out that for the Ordnance Survey bad roads under fourteen feet in width were untarred¹⁴. Inspection of the Yeovil and Blandford sheet of the One-inch Second War Revision (GSGS 3907) dated 1941 reveals that all those roads cleared from the 1951 state of quarter-inch sheet 11 were roads under fourteen feet of metalling in bad condition. This accords well with the same roads on sheet 178 of the New Popular Edition of the one-inch map. In general however the elimination of bad roads seems not to have been carried out even for all the areas where revision had been undertaken, for example on those One-inch Sixth Edition maps printed before the summer of 1940 but not published until 1945. The most likely explanation for wholesale clearing of minor roads is that it was done while it was still intended to revise and simultaneously improve the existing quarter-inch map but before a definite specification for a new edition had been agreed.

Thus it appears that the revision done for the one-inch map eventually found its way onto the quarter-inch map. However it stayed virtually unchanged until the results of the next revision, undertaken for the Seventh Series of the one-inch map became available. The only exceptions were major new roads and changes in classification or number, and the status of railway stations. The fifteen years after the war saw many closures of minor branch lines and stations both on them and at intervals along main lines. However, the long dismantled High Street station at Staines was still shown, admittedly closed, as it was from 1916. When the Seventh Series one-inch mapping had been completed it was then used for the redrawn Fifth series of the quarter-inch map from 1957 onwards.

OS Policy on the quarter-inch map and the transition to the Fifth Series

We are now able to delve into official OS policy as recorded in the file of policy papers preserved in the Public Record Office.¹⁵ We learn that the Director General in August 1951 saw no need for a Policy Paper on the quarter-inch map “but [thought] that a formal policy statement should be issued giving the current policy”.¹⁶ The original pencil draft reads:

“The Fourth Edition National Grid will be revised from the Seventh Edition One inch sheets as the latter are published. Experiments aimed at settling the design and method of production of the Fifth Edition will be carried out quickly and continuously until approval of the design is obtained. The specification of the Fifth Edition will then be drawn up. No progress work on the Fifth Edition will be put in hand until instructions are issued. Special system to cope with extra editions as a result of rapid ground developments ...”

There follows an extended discussion of a system of revision which seems only partly related to the quarter-inch map. The first typed draft issued in September 1951 went to principal officers for comment. DDSS (Deputy Director Small Scales) had only the comment “that he understood that the DG wished the half-inch series to be revived: that would presumably be attended to first?”¹⁷ It finally went to the DG on 19 October: one assumes in the file with the views of those who had already seen it. This provoked a page of comment suggesting that the historical section be radically shortened “to state that the Fourth Edition

¹⁴ Oliver, R R, *A Guide to the Ordnance Survey one-inch Fifth Edition*, London, Charles Close Society, 2000, p.23.

¹⁵ PRO OS 11/4 1951-1969. The quarter-inch map.

¹⁶ *ibid.* Minute 1, 20/8/51.

¹⁷ *ibid.* Minute 4, 25/9/51.

was made up from the Third Edition and is of poor quality and bad fit, owing to the methods used for the change of sheet lines.”¹⁸ It continued:

“As far as the policy is concerned, D.G. is now considering whether the Fifth Edition should not be started within the next two or three years. If he decides to put the Fifth Edition in hand there would be no object in revising from the Seventh Edition one-inch the sheets of the Fourth Edition since these would be the sheets that would be produced first on the Fifth Edition.”

Establishments had been allowed for sufficient draughtsmen to produce, per annum, twenty one-inch sheets, five half-inch sheets and one quarter-inch sheet all to be hand-written lettering. Mechanical name production would help but would then require more small-scale field revisers, which would be wasteful because they would be employed as such for only three or four years. The best policy would, therefore seem to be -

1. To settle the design of the Fifth Edition quarter-inch and to produce pilot sheet. This will take, say, two or three years.
2. During this period to concentrate on the one-inch until the production of that series has caught up on Field output.
3. As soon as the one-inch has caught up on Field output at full strength with all existing small-scale revisers, that the draughtsmen not required for the twenty sheets a year one-inch should be employed on quarter-inch.
4. Meanwhile revision of the existing quarter-inch would be confined to putting right errors that are brought to light and keeping the classification of Class I and II roads in line with the Ministry of Transport alteration.

Furthermore the DG did not consider the half-inch “as necessary as a good quarter-inch and would prefer to concentrate on the one-inch, then the quarter-inch before the half-inch”. Thus the policy statement was revised and the annexure to it amplifying it were submitted to the Policy Committee and agreed with amendments in December 1951. Two essential points embrace the policy for the quarter-inch map:

- “1. To consider the need for a map series on or near this scale, bearing in mind the existence of other standard Ordnance Survey series.
2. To study the probable major users of this series, their needs and the information which should be shown on the series to meet their needs.”

Note a change from “at this scale” to “at or near this scale” presumably to allow for the consideration of a natural scale of 1:250,000 instead of the 1:253,440, but without actually saying so. The annexure makes interesting reading in that it discusses the objects served by the quarter-inch map, filling a gap between the half-inch and the ten-mile scales, which it was assumed the OS would produce and maintain. There is a reference to a military requirement for a 1:250,000 map, but it justifies the need for the quarter-inch for long-distance road journeys and ease of handling. If the half-inch map were delayed, or dropped altogether the quarter-inch would of course be all the more essential. There is then an extended argument in favour of going for a 1:250,000 scale product, which “for all practical purposes can be used as a quarter-inch map, and vice versa”. It concludes that the advantages

¹⁸ *ibid.* Minute 9, 22/10/51. DMP (Director of Map Publication and Production) to ADCP (Assistant Director of Coordination and Planning) expressing the views of the DG. 22/10/51.

of a 1:250,000 map outweigh the disadvantages. The armed forces and motorists were considered to be the main users whose requirements in terms of content were made plain. The statement details the kinds of information to be shown with reference to the quantity of detail, given the need for clarity, viz. roads, settlements, railways, inland water, relief, woods, distinctive filling for built-up areas, physical features, coastal features and boundaries. Several new features are noted here: the depiction of trunk roads, changes in the higher layers to show relief, woods in fine black ornament (not adopted), black hatching rather than grey filling for built-up areas was recommended but not adopted.

It appears that an additional paragraph, attached to the paper in manuscript, was not accepted by the Policy Committee when submitted to the DG for approval. It is headed "Need to redraw the present map" which "cannot be maintained for long, even at reduced standards, without recourse to redrawing". It must have represented a commonly held view. By January 1952 a further modified Policy Statement was issued to make known OS policy on the quarter-inch map, "primarily intended for use by motorists, and as general reference maps and by the armed forces". The policy was "to replace the current 'Fourth Edition' Quarter-inch series in due course, with a new 1:250,000 series¹⁹ to be designed in accordance with the recommendations in the attached paper". At the same time the DG asked for a paper on outline procedures for changing from quarter-inch to 1:250,000 scales listing factors to be considered. The Director of Map Production and Publication (DMP)²⁰ commented before the file was sent to the DG to the effect that a suitable outline, water and contours base for fining down (thinning out) current detail could be produced by photography from existing materials. Subsidiary colour work and the incorporation of revision would place demands on draughtsmen affecting the programme for the One-inch Seventh Series. Four procedures were suggested with timings. The first was a gradual introduction of a new 1:250,000 regular series in step with the completion of One-inch Seventh Series. The second was to maintain the quarter-inch series until the one-inch programme had been completed and then to produce a new 1:250,000 series. The third involved producing a new 1:250,000 series once a design had been completed at the expense of progressing the one-inch programme. The fourth envisaged producing "a 1:250,000 provisional series by photography of available quarter-inch reproduction material, with some revision, followed by production of a regular 1:250,000 series as found convenient". The timings for each were given, but were later considered too optimistic. That depended on agreeing a specification (not yet achieved) and the earliest possible start of production in 1953. Completion of the Seventh Series one-inch was planned for 1960, to be followed by two years' work on the 1:250,000 in option two. The third option did not make sense if the new map was to be based on the revised one-inch. A redesigned but not revised 1:250,000 map would have appeared in 1954, but the one-inch only by 1962. The fourth was of dubious value in that something of lesser quality and of short currency would have intervened before a final, regular series was published.²¹ It was also pointed out that since the two series would not fit together the new scale map would have to replace the former completely, or stocks of both scales would have to be kept until the new scale map was completed. With regard to revision, although 30% of the one-inch

¹⁹ OS at the time expressed scales as fractions, but for the sake of consistency I have adopted current usage in the form of a ratio, viz 1:250,000 wherever scale is quoted.

²⁰ See Ordnance Survey. *Instructions for dealing with Documents and Correspondence* 1951. The appendix gives abbreviations and titles of Senior Officers and Establishment and Finance Sections.

²¹ PRO OS 11/4 Paper 14A undated but referred to in minute 14 of 17/1/52.

maps revision was available it was not being incorporated in Fourth Edition revision. Only what was called “intermediate revision” such as changes in road classification, correcting known errors and changes in grid numbering were being incorporated. It was acknowledged that the existing negatives were made with some difficulty from the security enamels. Since many corrections had been made to the negatives, it would be necessary to re-photograph the enamels to 1:250,000 scale and update these by a considerable amount of photowriting. Once the design and specification were settled the production of the new series could be effected in two years, assuming the source material for revision were available. This could be only the one-inch Seventh Series as no thought had been given to restoring the half-inch. All this discussion on the nature of the future 1:250,000 map was taking place as the specification for the one-inch Seventh Series was coming to a conclusion in early 1952. Indeed the pressure to launch the latter was probably responsible for a low level of activity on the 1:250,000 map until October 1952.²² Cuts in establishment by the new administration would also have had some impact. OS was also waiting for the reactions to the Policy Paper from DMilSurvey and the Ministry of Civil Aviation (MCA).

On 2 October 1952 the Advisory Committee on Survey and Mapping had discussed the issue of the change of scale to 1:250,000. The MCA preferred the latter to conform to ICAO scales. Willatts for the Ministry of Housing and Local Government said that they used the quarter-inch scale a lot but would be quite happy with the natural scale. The Geological Survey were a little uncertain how the change would affect geological maps. They were assured by the chairman that an opportunity to change scales would not occur again for another 30 or 40 years and that it would not introduce technical difficulties that could not be overcome. He would welcome demand from Military Survey and MCA for the new scale. In November Military Survey wrote coordinating their views with those of MCA. MCA wanted changes to GSGS 4735 to bring it into compliance with ICAO standards but supported the scale change.²³

Another year went by until the DG’s Committee met to discuss small scales policy in December 1953²⁴ but priorities were clearly expressed:

1. Completion and maintenance of the (Seventh series) one-inch coverage of Great Britain had priority.
2. “The 1/4" to 1 mile map will be redesigned and republished as soon as resources become available from (1) above.”
3. The specification for the new half-inch map was to be carried to completion, but no proof would be prepared until the one-inch map had been completed.
4. The redesign of the 1/4" map would accord with the best estimate to be made of users’ requirements.

The Director of Map Production was to begin investigations of the most suitable design and to be prepared to discuss outline specifications in due course. By January a revised policy statement and paper²⁵ was being considered by the DG whose annotations survive. Copies were also sent to other directors and to Military Survey. With reference to the Fourth Edition the paper thought the pattern too detailed and the different categories of road did not

²² Oliver R R, *A Guide to the Ordnance Survey One-Inch Seventh Series*, London, Charles Close Society, 1991. Page 7 recounts last minute experiments with the style and even the name of the Seventh Series before the first two sheets went on sale in September 1952.

²³ PRO OS 11/4 [21A or 22A] Director of Military Survey to DGOS. 11/11/52.

²⁴ *ibid*, Minute 22, 14/12/53.

²⁵ *ibid*. Minute 23. 4/1/54.

stand out clearly. Remedies were suggested. The DG wrote in the margin “the whole thing looks too heavy and ‘cluttered-up’ at the moment”, but he disagreed with the paper’s assertion that the density of place-names was about right because he thought they were too dense. Although the DG “hated” the conflict between layering of relief and the green woods he thought the Fourth Edition seemed to get round the problem very well. This revised policy paper was considered by the DG’s Committee on 19 January 1954 before Military Survey had had a chance to react to it, which they did on 28 January 1954. Brigadier de Vic Carey referred to the interest of ground and air forces in the quarter-inch series, but as a party to international agreements [e.g. NATO and ICAO] they had a slight preference for 1:250,000. They would not want as much topographical information to be shown as was possible, given the ingenuity and skill of OS draughtsmen. Overcrowded maps, which were difficult to read under operational conditions, would be “impossible to read in the cockpit of a jet fighter”. Other suggestions for ground use were that fewer names of minor villages should be included, relief should be shown by a layer system and contours at a vertical interval of 100m. For air use lakes, rivers, railways and woods needed to be heavily emphasised. Among roads, the main ones should stand out and be distinct from railways. In a final paragraph seeking a compromise between requirements for ground and air uses it was proposed that the design could be such that these distinct needs could be catered for by separate colour plates.²⁶ By early February 1954 the definitive Policy Paper, now headed ‘the 1:250,000 series’, was issued under the DG’s authority, two and a half years after the then DG saw no reason to issue one.²⁷

This policy statement refereed to its use by motorists, the armed forces and for general reference. “The policy is to replace the 4th edition, “Quarter Inch” series by a new 1:250,000 series” in accordance with recommendations contained in the annexure. Oddly the annexure is headed “THE QUARTER-INCH MAP”. After preliminary sections on need for a new map and its potential uses, it goes on to compare the information shown on the Fourth Edition with that to be included in the new map. We see that the Fourth Edition showed as “other metalled roads”, 14ft metalled and under 14ft tarred roads, but excluded the untarred roads. It was suggested that the full railway system shown on the Fourth Edition was “rather indistinct” and that it might be due to “the rather darker road pattern”. With regard to the density of place names the DG’s view was not supported, but their legibility needed to be improved, aided by Monotype founts and grey rather than black hatching for larger built-up areas. Confessing that the classification system for settlements by population on the Fourth Edition was not available, that employed for the ten-mile series was to be followed on the new 1:250,000 series. The current use of a 200' interval for contours up to 1000' left many areas with “no definition of ground shape at all”. Experiments were called for to find a solution. The practice of showing woodland by green on the Fourth Edition was to be adopted for the new map despite its conflict with layering. In sum, the design of the 1:250,000 series was to emphasise clarity and legibility rather than to maximise content. Thus it may be that the trial clearing of untarred roads from revised printings of England and Wales sheets 10 and 11 had convinced the OS that a simpler map would work better, but also satisfy users.

With policy clearly laid down, work could begin on translating the specification into proofs, settling the method of folding for sheets published in covers, and the appropriate sheet layout. It had been realised long since that the variation in size of the Fourth Edition

²⁶ PRO OS 11/4 26A Letter, DMilSurvey to DGOS, 28 January 1954.

²⁷ *ibid.* 27B. Minute 27 is dated 9/2/54.

sheets created problems for mounting and folding. Although preferences had been expressed on mock-ups of Bender folded sheets of a standard size in 1949, no definite decision had been made. In particular, two minutes in the previous file gave approval for a North-South Bender fold and an East-West Bender fold. New mock-ups were prepared but the decision hinged upon relative costs as well as convenience. By August 1954 attention had switched to incorporating town diagrams or plans in the Fifth Edition. Once again costs were examined, revealing that omitting them would allow maps to sold for 1/- less, before taking into account the cost of revision and platemaking. Finally in November 1954 the DG informed his senior officers that he wanted hill shading and contours on the new Fifth Edition. This departure from the previously approved coloured specifications seen on the so-called 'pilot strip' in the Potteries area, gave rise to much correspondence with private firms and experiments with air-brush techniques. It was not until April 1956 that the DG could be shown what the new Fifth Edition would look like.²⁸ It is no surprise that the life of the ageing Fourth Edition was further prolonged. In February 1955 it had been firmly stated that "no further revised sheets will be issued of the quarter-inch 4th Edition".

Subsequently the Policy Statement approved on 2 February 1954 was amended several times. By February 1957 it was decided that the new series would be called the "Quarter-inch Fifth Series", an ambivalent choice of title which allowed the OS to employ a proper metric scale for a country which would continue to use miles for its road system. Then in February 1958 there are some references to holding stocks of the Fourth Edition along with those of the Fifth until the latter replaced it. The late 1950s saw the completion of the specification for the Fifth Series, the publication of the prototype sheet 10 in 1957 and the special sheet, Wales and the Marches in 1959.

Covers for the series were produced in bulk and do not necessarily reflect the date of printing of the map inside them. In general there are two styles reflecting the change in the National Grid system whereby 100km squares were indicated by two letters rather than numbers. The long format of 32cm by 12.5cm, well suited to the luggage nets inside the roofs of pre-war limousines, was cumbersome and dated. The varying size of the sheets in the series also made opening them somewhat of a lottery, often with an irritating second fold hiding the conventional signs and other marginal information.

During the war an outline version in grey was produced for official purposes. It is printed in grey with blue for water line features including the limits of reservoirs and lakes. It also has a metric grid called THE ORDNANCE SURVEY GRID but was never on sale or used by the military for fear of confusion between the two grid systems. Exceptionally sheet England & Wales 9 of this series has a skeleton grid in blue. There were other editions apart from the fully coloured edition: an outline version in black without contours published simultaneously with the fully coloured style; a version with the administrative boundaries in Scotland overprinted on the base map from about 1947; and a print of water and contours in blue and brown only, intended for teaching physical geography. Several editions of the military issues of this map are known, but not all sheets have yet been recorded. Essentially the same mapping, but with a military grid in purple is overprinted on top of the National Grid. Some of these have air information added to them in blue: others were intended for manoeuvres. Details of these are given by Hellyer (1999)²⁹ in sections 56 M 9-14 and 60 M 6-10.

²⁸ This paragraph is based on PRO OS 1 /236. Detailed references to papers in the file will be given in a future paper devoted to the Fifth series.

²⁹ Hellyer, R, *Ordnance Survey Small-Scale Maps Indexes: 1801-1998*, Kerry, David Archer, 1999.

Harley argued in 1975 that the Fourth Edition sheets ‘were becoming overcrowded’.³⁰ In fact they were always overcrowded and hard to read. The war and post-war reconstruction gave priority to other OS projects coupled with the over-long gestation period for the Fifth Edition allowed such a poor map to survive for so long.

When the last sheets of the Fifth Series of the quarter-inch map had been published in February 1963, the OS Monthly Publication Report carried a page announcing the completion of the series, placing it in historical context. Comparing it with the Fourth Edition, it asserted that “the amount of detail on the Fifth Series has been reduced in the knowledge that there exists an up-to-date one-inch map for more detailed reference.” It also referred to the “addition of hill shading to give a more readable picture of the ground”. Moreover a special effort was made to help the motorist with the definition of types of roads.

Appendix 1 – Known states of the Ordnance Survey Quarter-inch Fourth Edition (with National Grid)

1	2	3	4	5	6	7	8	9	10
<i>England & Wales sheet 1 (common to Scotland). The Border</i>									
23046/Cr		Coloured	1946	No	No	B	1946	8/46	1922
B		Coloured	1952	Yes	Yes	D	1946		1922
2046/Cr		Outline	1946	No			1946		1922
B		Outline	1952			E 3/6	1946		1922
<i>England & Wales sheet 2. North Central</i>									
20046		Coloured	1946	No	No	B	1946	9/46	1921
2028		Coloured	1951	Yes	No	B	1946		1921
A//	No	Coloured	1959	Yes	Yes	E	1946		1921
2046		Outline	1946	No	No	B	1946		1921
2028		Outline	1952			E 3/6	1946		1921
<i>England & Wales sheet 3. England, North East</i>									
20046/Cr.		Coloured	1946	No	No	B	1946	7/46	1920
2029		Coloured	1951	No	No	C	1946		1920
A//	Yes	Coloured	1959	No	Yes	E	1946		1920
2046/Cr		Outline	1946	No	No	B	1946		1920
A//		Outline	1959			E 3/6	1946		1920
<i>England & Wales sheet 4. North Wales and Manchester</i>									
20046		Coloured	1946	No	No	B	1946	8/46	1919
2025		Coloured	1949	Yes	No	B	1946		1919
2030		Coloured	1951	Yes	No	C	1946		1919
D	Yes	Coloured	1952	Yes	Yes	D	1946		1919
2046		Outline	1946	No	No	B	1946		1919
D		Outline	1952		Yes	E 3/6	1946		1919
<i>England & Wales sheet 6. North Midlands and Lincolnshire</i>									
20046/Cr.		Coloured	1946	No	No	B	1946	5/46	1920
2026		Coloured	1950	Yes	Yes	B	1946		1920
2036		Coloured	1952	Yes	No	C	1946		1920
C/	Yes	Coloured	1960	Yes	Yes	E	1946		1920
2046/Cr		Outline	1946	No	No	B	1946		1920
C		Outline	1952		Yes	E 3/6	1946		1920
C/		Outline	1960		Yes	E 3/6	1946		1920

³⁰ Harley, J B, *Ordnance Survey Maps a descriptive manual*, HMSO for Ordnance Survey, 1975.

1	2	3	4	5	6	7	8	9	10
<i>England & Wales sheet 7. South Wales</i>									
20,046/Cr.		Coloured	1946	No	No	B	1946	5/46	1919
2027		Coloured	1950	Yes	Yes	B	1946		1919
C		Coloured	1952	Yes	Yes	D	1946		1919
2046/Cr		Outline	1946	No	No	B	1946		1919
C		Outline	1952			E 3/-pv	1946		1919
<i>England & Wales sheet 8. Midlands</i>									
20046/Cr.		Coloured	1946	No	No	B	1946	3/46	1915
2023		Coloured	1946	No	No	B	1946		1915
2031		Coloured	1951	Yes	Yes	C	1946		1915
2038									
D		Coloured	1952	Yes	Yes	D	1946		1915
D/	No	Coloured	1960	Yes	Yes	E	1946		1915
2046/Cr		Outline	1946	No	No	B	1946		1915
D		Outline	1952			E 3/-pv	1946		1915
<i>England & Wales sheet 9. East Anglia</i>									
20,046/Cr.		Coloured	1946	No	No	B	1946	3/46	1930
2024		Coloured	1946	No	No	B	1946		1930
2032		Coloured	1951	Yes	Yes	C	1946		1930
C		Coloured	1952	Yes	Yes	D	1946		1930
C/	No	Coloured	1958	Yes	Yes	E	1946		1930
2046/Cr		Outline	1946	No	No	B	1946		1930
C		Outline	1952		Yes	E 3/6v	1946		1930
C/		Outline	1958			E 3/6	1946		1930
<i>England & Wales sheet 10. England, South West</i>									
23046/Cr.		Coloured	1946	No	No	B	1946	2/46	1930
2020		Coloured	1946	No	No	B	1946		1930
2039		Coloured	1952	Yes	Yes	D	1946		1930
A///	Yes	Coloured	1958	Yes	Yes	E	1946		1930
1546/Cr		Outline	1946	No	No	B	1946		1930
2039		Outline	1952		Yes	E 3/6v	1946		1930
<i>England & Wales sheet 11. England, South</i>									
20,045/Ch		Coloured	1945	No	No	A	1945	8/45	1930
2021		Coloured	1945	No	No	B	1945		1930
2033		Coloured	1951	Yes	Yes	C	1945		1930
E		Coloured	1952	Yes	Yes	D	1945		1930
E/	No	Coloured	1959	Yes	Yes	E	1945		1930
1045/Ch. ³¹		Outline	1945			A b	1945		1930
1045/Ch. ³²		Outline	1945			A b	1945		1930
1046/Ch. ³³		Outline	1945						
2021		Outline	1945						
E		Outline	1952			E 3/6v	1945		1930

³¹ British Library copy: woodland filled in grey.

³² Bodleian copy: woodland not filled in grey.

³³ Does this exist?

1	2	3	4	5	6	7	8	9	10
<i>England & Wales sheet 12. England, South East and London</i>									
25045/Ch		Coloured	1945	No	No	A	1945	10/45	1930
2022		Coloured	1945	No	No	B	1945		1930
2034		Coloured	1951	Yes	Yes	C	1945		1930
D		Coloured	1955	Yes	Yes	D	1945		1930
D/	Yes	Coloured	1958	Yes	Yes	E	1945		1930
2045/Ch.		Outline	1945	No	No	A	1945		1930
2022		Outline	1945						
D		Outline	1955			E 3/6v	1945		1930
<i>Scotland sheet 2. Scotland, South West</i>									
200 46		Coloured	1946	No	No	B	1946	8/46	1923
A/	Yes	Coloured	1960	Yes	Yes	E	1946		1923
2046		Outline	1946	No	No	B	1946		1923
2046		Outline	1946			E	1946		1923
<i>Scotland sheet 3. The Forth, Clyde and Tay</i>									
20046.Cr		Coloured	1946	No	No	B	1946	4/46	1923
B/	Yes	Coloured	1957	Yes	Yes	D1	1946		1923
1046/Cr		Outline	1946	No	No	B	1946		1923
B/		Outline	1957			E 3/6	1946		1923
<i>Scotland sheet 4. Glasgow and the Middle West</i>									
15046/Cr.		Coloured	1946	No	No	B	1946	3/46	1923
2019		Coloured	1948	No	No		1946		1923
2040		Coloured	1952	Yes	Yes	D	1946		1923
A//		Coloured	1957	Yes	Yes	D	1946		1923
A///	Yes	Coloured	1959	?Yes	Yes	E	1946		1923
1046/Cr		Outline	1946	No	No	B	1946		1923
2019		Outline	1948			E 3/6	1948		1923
<i>Scotland sheet 5. The Eastern Highlands</i>									
15046		Coloured	1946	No	No	B	1946	9/46	1925
B		Coloured	1952	Yes	Yes	D	1946		1925
1046		Outline	1946	No	No	B	1946		1923
B		Outline	1952			E 3/6	1946		1923
<i>Scotland sheet 6. Skye and the Outer Hebrides</i>									
15046		Coloured	1946	No	No	B	1946	11/46	1927
A/	No	Coloured	1960	Yes	Yes	E	1946		1927
1046		Outline	1946	No	No	B	1946		1923
1046		Outline	1946	No	No	E 3/6	1946		1923
<i>Scotland sheet 7. Scotland North</i>									
15046		Coloured	1946	No	No	B	1946	12/46	1927
A									
A/	No	Coloured	1958	Yes	Yes	D	1946		1927
1046		Outline	1946	No	No	B	1946		1927
A		Outline	1952			E 3/6	1946		1927
<i>Scotland sheets 8 & 9 (combined on one sheet) Orkney and Shetland Islands</i>									
5046		Coloured	1946	No	No	B	1946	12/46	1928
2035		Coloured	1951	Yes	?	B	1946		1928
746		Outline	1946	No	No	B	1946		1928
B		Outline	1952			E 3/6	1946		

Explanation of the columns above.

1. Imprint or print-reference code. These include the pre-war method of showing the size of the print run in hundreds and the last two digits of the year, sometimes followed by a code for the place of printing. These were replaced by four digit 'unique numbers' often pre-allocated in batches. These were finally replaced by a letter to indicate an edition qualified by a line underneath it to mark minor changes. In general this series does not contain much explicit information about what changes have been made.
2. Presence or absence of town plans or traffic diagrams. These are always dated 1948 and were abandoned in the late 1950s when it was patently obvious that the traffic lights, one-way streets and other detail were out of date. All fully coloured sheets are known with town plans. The original printings from 1945 and 1946 had no town plans. Only those final printings from the late 1950s are shown with or without town plans, demonstrating some inconsistency.
3. Coloured or outline editions. All the states listed here as coloured are printed in ten colours.
4. Date of the magnetic variation. This was originally shown in a diagram, but in later states it is incorporated in a text note in the bottom right hand border. This is often the only way of dating the printing.
5. Some detail cleared usually from the minor roads, but some new minor roads added.
6. Re-positioning of the grid values along the northern and southern margins of the sheet to make them right-reading.
7. The letter codes indicate the price stated on the map.

The following regimes were in force, the first (A) up to 31 August 1945. Subsequent changes were introduced on 1 September 1945, 1 July 1950, 1st July 1952, mid-1956, 1 July 1958

<i>Code</i>	<i>Paper flat</i>	<i>Paper folded</i>	<i>Mounted & folded</i>	<i>Dissected</i>	<i>Outline</i>
A	2/-	2/3	3/-	4/6	1/6
B	2/6	2/9	3/9	6/-	2/-
C	3/-	3/9	6/3	10/6	3/-
D	3/-	5/-	8/-	----	3/-
D1	3/-	[5/-]	[]	----	[]
E	3/6	[5/6]	[8/-]	----	[]

Under E, prices are given on the map itself for paper flat versions, other formats are usually indicated on the covers. Prices in square brackets are deduced from covers and price lists. v after a price indicates that it is made by a violet hand stamp; pv indicates that the price in the table is printed on the map, but that it has been increased to 3/6 by a violet hand stamp; b indicates that it was updated by a blue label. On the covers prices are often altered by labels carrying the new prices, sometimes more than once.

8. Publication date as stated on the map.
9. Supplementary information on date of publication. This is essentially the month in which the map is reported as published in the OS Publication Reports. These were issued monthly hence their date is the month and year of that report. Unfortunately only the announcement of the first publication of each sheet is given. None of the subsequent states of these maps merited an entry in the later reports.
10. Date of full revision.

Appendix 2 – Sales of sheets of the Quarter-inch Fourth Edition with National Grid for 1949

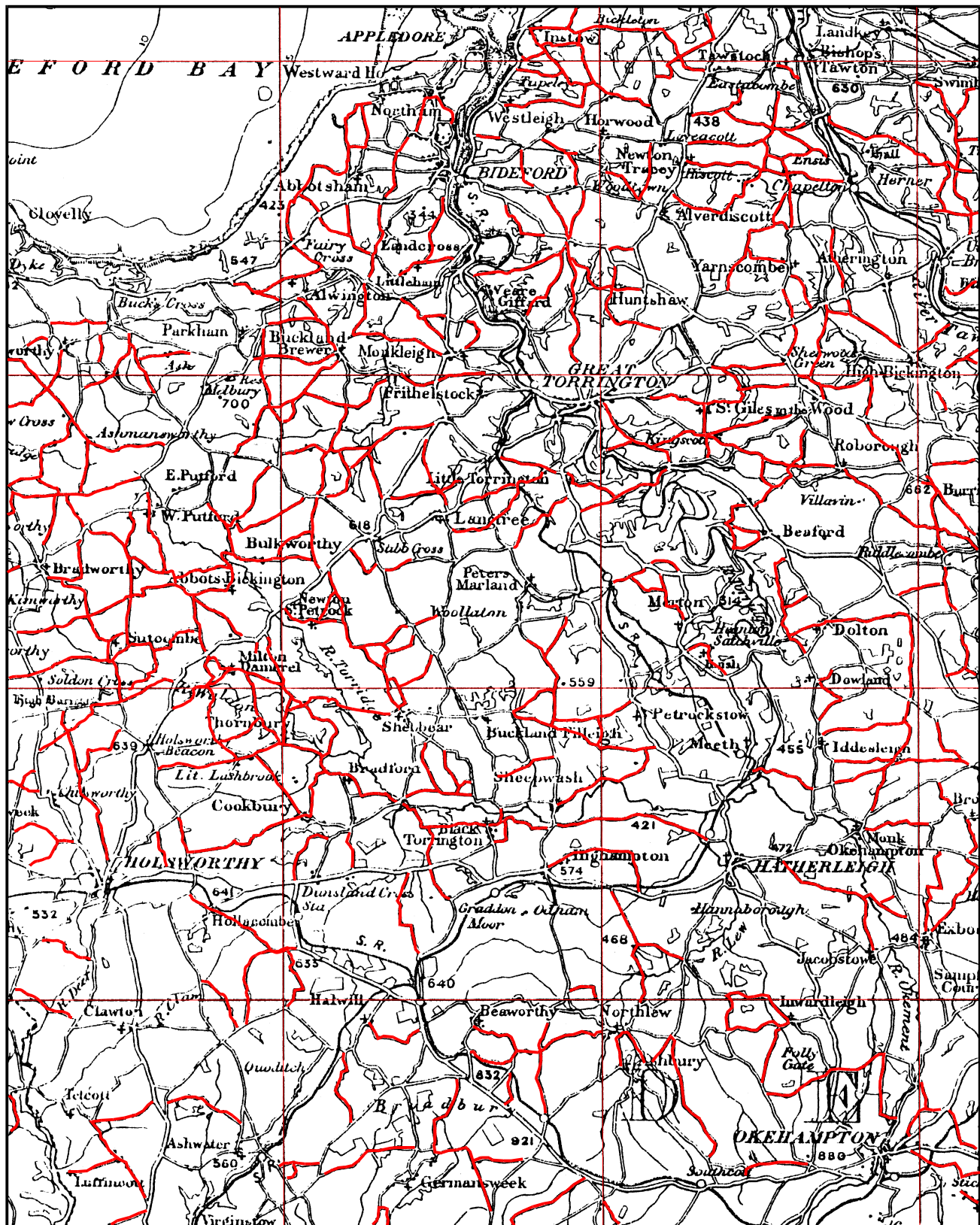
<i>Sheet number</i>	<i>Paper flat</i>	<i>Paper folded</i>	<i>Dissected</i>	<i>Mounted & folded</i>	<i>Total</i>	<i>Percent of total</i>
England & Wales						
1	288	170	307	1741	2506	4.2
2	306	161	93	1813	2373	4.0
3	252	332	85	2251	2920	4.9
4	469	847	200	3455	4971	8.3
6	337	547	175	3014	4073	6.8
7	358	209	153	2243	2963	5.0
8	482	865	95	3461	4903	8.2
9	269	898	242	3207	4616	7.7
10	340	845	116	4731	6032	10.1
11	391	896	85	4133	5505	9.2
12	618	1455	208	4956	7237	12.1
<i>Sub total E & W</i>	4110	7225	1759	35005	48099	80.4
Scotland						
2	168	178	132	1421	1899	3.2
3	124	151	38	1059	1372	2.3
4	496	357	127	2230	3210	5.4
5	78	200	118	2109	2505	4.2
6	155	135	86	810	1186	2.0
7	141	26	55	569	791	1.3
8 & 9	131	69	54	493	747	1.2
<i>Sub total Scotland</i>	1293	1116	610	8691	11710	19.6
<i>Total GB</i>	5403	8341	2369	43696	59809	

Source: PRO OS 1/426, table dated 2/1/50. Note that three incorrect totals have been replaced.

Acknowledgements

I am indebted to Dr Richard Oliver for reading a draft of this paper and for some insights, and to Dr Roger Hellyer for additional information, but the responsibility for this text is mine. The staff of the British Library, National Library of Scotland, the Royal Geographical Society and the Public Record Office have as usual been most helpful.

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Extract from Quarter-inch Fourth Edition, National Grid, England and Wales sheet 10, 1546/Cr; outline printing.

The red overprint shows minor roads removed from later issues of this sheet.





The Hounslow Heath base

Above left: Brian Adams and David Watt inspecting the Hampton Poor House Cannon, Roy Grove.

Below left: The plaque at the Hampton Poor House Cannon

Above: The King's Arbour Cannon, Heathrow.

Below: A transcription of the tablet on Heathrow Police Station

109 yards to the south of this tablet is
**THE NORTH WEST TERMINAL
 OF THE FIRST BASELINE OF THE
 TRIANGULATION OF GREAT BRITAIN**
 The base was measured in 1784 by
MAJOR-GENERAL WILLIAM ROY F.R.S.
 "the Father of the Ordnance Survey"



The Salisbury Plain base

Above: The Old Sarum Gun – still secure after 200 years.

Right: The commemorative stone at Old Sarum

*In 1794
a line from this site
to Beacon Hill was measured by
Capt W Mudge of the Ordnance Survey
as a base for the triangulation of
Great Britain*

Presented by Master Masons 1967



The Bases of the Ordnance Survey

Peter Haigh

Introduction

One key feature which distinguished the early work of the Ordnance Survey from its predecessors was its foundation upon a trigonometrical survey. A trigonometrical survey depends not only upon the accurate measurement of the angles of the triangles but, to provide scale, upon the measurement of the length of the side of one of the triangles – the base. Subsequent measurement of the length of the side of another triangle provides verification of the accuracy both of the angles measured in the intervening triangulation and of the original base measurement.

Over the years the Ordnance Survey has measured, often more than once, quite a number of bases. Normally the details of these measurements have been published but the resultant references are widely scattered throughout the literature. Seymour's *History of the Ordnance Survey* contains much of the key information but even here the resultant references are scattered through the volume. Few references give any information about what, if anything, an observer may find if a site is visited today. This paper attempts to draw together a summary of the information for each base, together with information on the current position.

For each base the length is given, standardised in kilometres; this is intended for comparative purposes. Early measurements were in feet, modern ones have been in metres but readers wishing to know the precise lengths are referred back to the primary literature; too many standards have been used over the years for the full details to be included in this summary. Suffice to say that most of the bases are of comparable length averaging (excluding Caithness) 9.1 km or 5.7 miles; Lossiemouth is the shortest, Caithness (by far) the longest.

As with the length, the geographical positions of the terminal points were published in the contemporary reports. These positions were of course calculated in accordance with the spheroid in accepted use at the period concerned. In the mid-nineteenth century Clarke¹, in his *Account of ... the principal triangulation ...*, provided two lists of positions of stations using two different spheroids but, for positions based on the Airy spheroid, only a limited number of stations were included. I am however indebted to Brian Adams for providing me with the listing of the positions of the terminals based on the Airy spheroid from a report produced much later by Major Alan Wolff.² The six figure grid references of the terminals and the current 1:50,000 sheet numbers are also given for the benefit of readers who may wish to identify the sites.

The measurements here described were made by the use of chains, wooden rods, glass tubes, compensation bars, invar tapes, pulsed lightbeams, pulsed microwaves and satellite systems. This paper therefore summarises information about 22 measurements of eleven bases by eight different methods.

¹ Clarke, A R, 1858, *Account of the observations and calculations, of the principal triangulation; and of the figure, dimensions and mean specific gravity, of the earth as derived therefrom* London, Eyre and Spottiswoode.

² Wolff, A J, 1919, *The mathematical basis of the Ordnance maps of the United Kingdom* OS. [This contains the only complete list of the geographical positions of the old Principal Triangulation; it was produced 'For Departmental Use', this information and all these co-ordinates supplied by Brian Adams.]

*The Bases***Hounslow Heath 1784****8.4 km**

<i>Station</i>	<i>Latitude</i>	<i>Longitude W</i>	<i>Source</i>	<i>Grid Ref</i>	<i>Map</i>
King's Arbour	51 28 45.49	0 26 55.45	Wolff p21	TQ 077768	176
Hampton Poor House	51 25 33.44	0 21 50.98	Wolff p20	TQ 137710	176

In 1783, following representations from the French government to the British government, it was agreed that work should be undertaken to fix the relative positions of the Greenwich and Paris Observatories. This work was funded by the Treasury, sponsored by the Royal Society and undertaken by General William Roy. Roy's first task was to measure a base on Hounslow Heath: the following provides an outline of Roy's work.

The terminal stations were marked by buried cartwheels with a hollow wooden tube fixed vertically above each axle, the centre of the axle marking the precise terminal point. The initial setting out of the line was by erecting a flagstaff above the Hampton Poor House wheel. For each point this flagstaff (with some relays) was then aligned with Banstead church spire.

The base was in fact measured three times. First was an approximate measurement with a chain laid on the ground. Secondly using 20ft wooden (deal) rods; this measurement was completed although it was realised, prior to completion, that, with the variations in humidity in the British climate, the rods were not of an adequately stable length. Jesse Ramsden therefore made some 20ft glass tubes (an inch in diameter and frequently referred to as rods) and it was with these that the final measurement was made.

A long and detailed report of this work was published by Roy. The visits by George III, the tents and hospitality provided by Sir Joseph Banks, President of the Royal Society, and the ability to see clear through the tubes are amongst the features that have often been quoted by subsequent historians.³

1791

'Every base intended to become the groundwork of such nice operations [the Trigonometrical Survey] ought ... to be measured twice at least' Thus it was decided, seven years after the original measurement, to remeasure this base.

New chains were commissioned from Ramsden, similar in construction to those used previously, the main difference was that the new chains had 40 links each 2½ feet long. The chains were tensioned in wooden coffers and the measurement took place in August and September. The Astronomer Royal, Dr Maskelyne, and Dr Hutton from the Royal Military Academy at Woolwich attended on the last day. The horizontal distance from the end of the last chain to the axis of the pipe was found by Ramsden (there with his standard brass scale and beam compasses) to be 21.055 inches.

When all the necessary temperature and other corrections had been made, the result was that the 1784 and the 1791 measurements differed by 2¾ inches, considered a most satisfactory result, and the mean of the two was taken as the true length of the base, 27,404.2 feet.

As the wooden tubes above the wheels had rotted, even in this short time, with the greatest care to ensure precise positioning, the wheels were replaced with two cannon

³ Roy, W, 1785, 'An Account of the Measurement of a Base on Hounslow Heath', *Phil Trans*, **75**, pp385-480.

mounted with their barrels upright; the ends of the base being marks on wooden plugs at the centre of each barrel.⁴

1926 - 1972

1926 saw the bicentenary of Roy's birth and this was celebrated in two ways. First plaques commemorating the event were, belatedly, fixed to the cannon in February 1927.⁵ Secondly it was decided to print the baseline on the Ordnance map. It first appeared on the 1929 printing of Popular Edition sheet 114 *Windsor*⁶ and subsequently on Fifth Edition small sheet 114 *Windsor*, large sheet [114] *London* and the *Greater London* half-inch (including the 1945 reprint). Following the development of the airport at Heathrow during and after the 1939-45 war, the line was not included on the New Popular sheet.

The cannon was removed from King's Arbour Field in 1944 and placed in front of the temporary OS headquarters at Chessington. When the Survey returned to Southampton in 1968, the cannon was returned to Heathrow, where it was put into store. At this stage a tablet was placed on the south wall of the police station stating that the terminal was 109 yards to the south.⁷ On 21 June 1972 the cannon was carefully replaced in its original position.⁸

The area surrounding the Hampton Poor House cannon was just a grass field until 1947 and known as Cannon Field. The area was then developed for housing with the cannon in an extra wide space between the two houses on either side; the road was named Roy Grove. The adjacent road, Cannon Close, was also built in 1947 and takes its name from the cannon.

1997

One of the main events in 1997 to celebrate the 250th anniversary of the foundation of the Military Survey was the remeasuring, by modern methods, of this base. GPS equipment was used in front of the assembled dignitaries and the slope distance between the two terminals calculated. This provided a remarkable confirmation of the accuracy of Mudge's measuring procedures. Comparisons of the various measures involved are given in Adams.⁹

The site today

Both cannons are in place, with their plaques mounted adjacent to them, and both may be visited. The Hampton Poor House cannon is now a Grade 2 listed building.¹⁰

The cannon at Heathrow is at the junction of Nene Road and the Northern Perimeter Road, just outside the car park fence - the car park contractors having duly 'worked round the cannon'.¹¹ Members may also be interested to note that Brian Adams's rabbit, or at least one of its descendants, is still to be found. The *Landranger* sheet has sufficient space for the (unexplained) word 'Cannon' to be printed. It is not really feasible for air passengers with time on their hands to walk from the air terminals to the Heathrow cannon. The distance is approximately 1 km from terminals 1, 2 and 3; in any case they would probably be run over

⁴ Williams, E, Mudge, W and Dalby, I, 1795, 'An Account of the Trigonometrical Survey carried on in the Years 1791, 1792, 1793 and 1794', *Phil Trans*, pp414-591.

⁵ Close, C F, 1927, 'The two-hundredth anniversary of the birth of General Roy', *Geographical Journal*, **69**, pp350-355.

⁶ Hodson, Y, 1999, *Popular Maps*, Charles Close Society, p342.

⁷ Adams, B, 1997, 'Hounslow Heath, Hampton and Heathrow – Roy Re-visited and Re-measured', *Sheetlines* 50, 46-7.

⁸ *OS Bulletin* 5/73 (2).

⁹ Adams, 1997.

¹⁰ *Delta Standard Report* 6/2/89 in *Buildings in Hampton* vol 2 [no publisher].

¹¹ Adams, 1997.

long before they made it! It is also almost impossible to park there. The best bet is to catch a bus; services 105, 111, 140, 285, 555 and 556 go from terminals 1, 2 and 3.

The majority of the base is now a built up area of course, with the Heathrow apron and runways being the largest open space.

Romney Marsh 1787

8.7 km

High Nook	51 01 11.7	E 0 59 14.6	Roy ¹² 1790 p232	TR 098287	189
Ruckinge	51 03 54.9	E 0 53 12.6	Roy 1790 p232	TR 025334	189

Note that these positions are based on Bouguer's second spheroid.

For the British part of the triangulation linking Greenwich and Paris, Roy required a base of verification besides the prime base which had already been measured on Hounslow Heath. Romney Marsh was chosen. Roy decided to measure this base using the same 100ft chains (containing 100 links, each of one foot) which had been used for the preliminary measurement on Hounslow Heath.¹³ This time the chains were to be held under tension in deal coffers and the apparatus provided by Ramsden for this tensioning led to a dispute between Roy and Ramsden. Manuscripts from the Royal Society archives on this matter are discussed by O'Donoghue.^{14 15} This base was not subsequently used by Mudge as a base of verification in the primary triangulation of Britain.

1991

Many activities were arranged in 1991 to celebrate the bicentenary of the Ordnance Survey. One of the less well documented took place in Kent. The Post Office's celebratory stamps featured Ham Street and the sub-postmaster at the nearest office, Ruckinge, was to be found stamping first day covers. To add to the celebrations, staff from the Survey, dressed in eighteenth century costume, demonstrated the use of theodolites and the base was remeasured using GPS equipment. All this was observed not only by senior staff of the Survey but also by some members of this Society.

The site today

A report from the Society's recent visit to Ruckinge is printed elsewhere in this issue. At Dymchurch the High Nook terminal is near the back fence of the first houses of the (grandly titled but single road) High Knocke Estate.

Salisbury Plain 1794

11.1 km

Beacon Hill	51 10 59.23	1 43 15.51	Wolff p19	SU 195428	184
Old Sarum Gun	51 5 42.12	1 47 49.08	Wolff p22	SU 142330	184

As the triangulation extended north and west from London a base of verification was required, and a location on Salisbury Plain decided upon. The terminals were initially marked by stones sunk in the ground but these were quickly replaced by two iron cannon, copying the method that had been used on Hounslow Heath. For tracing out the line of the base the great theodolite was installed at Beacon Hill and 'many points in the true direction were

¹² Roy, W, 1790, 'An Account of the Trigonometrical Operation, whereby the Distance between the Meridians of the Royal Observatories of Greenwich and Paris has been determined', *Phil Trans*, **80**, pp111-271.

¹³ One is at the Science Museum, see the photograph in Hodson, Y, 1991, *Map Making in the Tower of London*, OS, p21.

¹⁴ Roy 1790.

¹⁵ O'Donoghue, Y, 1977, *William Roy 1726-1790*, British Library, p45.

found by bisecting the staff erected at Old Sarum'. The measurement was made using the pair of 100 ft chains that had first been used three years previously on Hounslow Heath; one was used in the field and the other as the standard. On the final chaining a hole was drilled in the wooden coffer and a plumb bob dropped to the terminal marker. A scratch mark was put on the chain and this was then returned to Ramsden for this distance to be measured. Four different ways of calculating the length through the triangulation were available and there was satisfactory agreement with the most secure of these methods and the chained length.¹⁶

1849

When, in the 1840s, the calculations for the Principal Triangulation were being initiated, it was acknowledged that the most accurately measured base was that at Lough Foyle. Using that as standard and working back through the triangulation, the calculated length of the Salisbury Plain base was found to exceed the measured length by about one foot. This was deemed unsatisfactory and it was decided to measure the English base using Colby's compensation bars. This was done by Yolland in 1849.

The guns emplaced by Mudge 50 years earlier were easily located and deemed sound but it was found that 'the extremities of the line were not reciprocally visible'. A 32 foot scaffold tower was therefore constructed at Old Sarum for the Royal Society theodolite whilst the OS's own 3ft theodolite was installed at Beacon Hill. These instruments served to align the base and connect it with the triangulation.

The result of the remeasurement was much more satisfactory, being 1.028 feet longer than the original measurement, and in very close agreement with the calculated length. It was this, together with the length of the Lough Foyle baseline which were taken forward in the adjustment of the Principal Triangulation. Four of the other six bases measured to this time, that is excluding Romney Marsh and Sedgemoor, being considered as bases of verification.¹⁷

The site today

The Old Sarum Gun is still secure after more than 200 years. A 1½m stone, erected by the freemasons, commemorates the base measurement and stands on the edge of a new cycleway. In the field, three metres behind it and much more discreet, the gun is soon lost in the summer vegetation. The Landranger map helpfully states 'Gun, End of Base'.

A standard triangulation pillar, flush bracket number S1504, stands prominently on Beacon Hill above the busy A303 dual carriageway. Beacon Hill was one of the eleven stations from Figures 1 and 2 of the Retriangulation that were identical in location with Clarke's Principal Triangulation. (The combined figure was adjusted to give the best fit with the Principal Triangulation at these eleven points). The pillar is part of the current GPS network and carries the standard plaque (160mm × 70mm dated July 1999¹⁸) to this effect. Whether this location will be interference free is another question, the summit seems surrounded by a forest of telecommunications masts.

Since the triangulation pillar on Beacon Hill was located precisely on the location of the gun, then the gun must have been removed. I have not found any references which give the fate of that gun. Does any member have any information?

About 2½ km of the base is within the precincts of Boscombe Down Airfield.

¹⁶ Williams et al, pp474-88.

¹⁷ Clarke, pp214-217.

¹⁸ *Sheetlines* 58, p44.

Sedgemoor 1798**8.4 km**

Lugshorn Corner	-	-	Mudge ¹⁹ 1800	ST 479315	182
Greylock's Fossway	-	-	Mudge 1800	ST 400346	182

The measurement of this base seems to have been beset with difficulties. King's Sedgemoor was due to be enclosed in the autumn and the measurement was rushed through (begun in July and finished in August) before enclosure was commenced. In spite of this the surveyors found 'a great ditch was being excavated in a direction coincident with the base, whilst measurement was going on at the upper end of it', and an offset had to be made. Special 50ft chains were made by Ramsden, otherwise the ends of a standard 100ft chain would, on a number of occasions, have ended above a ditch. The tripods trembled in the soft ground when staff walked nearby and the early readings had to be repeated. It seems hardly surprising therefore that the scientific part of the work seems to have been reported briefly, that I could not locate the latitude and longitude of the terminal stations in the tables which included nearby stations and prominent landmarks in the area and why subsequent work seems to have managed without further recourse to this base.²⁰ The grid references above have therefore been obtained by referring Mudge's descriptions of the terminals to modern mapping.

The site today

Ironically the enclosure work, which caused the Survey to take such precipitate action, seems to have fossilised the landscape for the next 200 years. The general position of the end stations can be identified from the descriptions given but scaffolds must have been used since they stand level with the rest of the moor. Between is a peaceful pastoral landscape.

Misterton Carr 1801**8.0 km**

Misterton Carr North End	53 31 45.09	0 54 15.02	Wolff p21	SE 726042	112
Misterton Carr South End	53 27 28.48	0 55 22.56	Wolff p21	SK 715963	112

The terminals were marked with large blocks of oak, and the measurement was made with chains, as on Salisbury Plain.²¹ Fifty years later, Clarke was not able to locate these blocks.²²

The site today

This is high grade arable land. A minor road runs dead straight across the carr land and the base lies parallel to and 500 metres west of this, between the dikes of the Rivers Torne and Idle. About a third of the base is below the zero contour level. In the absence of fixed markers there is little further to add but to state that the triangulation pillar on the dike 500 metres east of the road at the south end does not appear to be related to the base.

Rhuddlan Marsh 1806**7.5 km**

Rhuddlan Base East End	53 17 11.21	3 28 15.11	Wolff p22	SJ 020777	116
Rhuddlan Base West End	53 17 40.43	3 34 55.62	Wolff p22	SH 946787	116

¹⁹ Mudge, W and Dalby, I, 1800, 'An Account of the Trigonometrical Survey carried on in the Years 1797, 1798 and 1799', *Phil Trans*, pp539-728.

²⁰ Mudge and Dalby, p556...

²¹ Mudge W, 1803, 'An Account of the Measurement of an Arc of the Meridian, extending from Dunnose ... To Clifton ...' *Phil Trans*, p418.

²² Clarke, p211.

The terminals were again marked with blocks of wood and the distance chained.²³ Of the blocks of wood, Clarke remarked ‘unfortunately every trace has been lost’.²⁴

The site today

Surprisingly, in view of the normal congestion on the North Wales coastal plain, 85% of this base is still pastoral. Presumably the suffix ‘marsh’ in the title gives the clue. At the western end the sea wall, on which the terminal was sited, has recently been rebuilt. Immediately inland the railway and station have been there for 150 years. The Pensarn suburb of Abegle covers the first 800 metres of the base. At the eastern end a bramble and nettle covered mound, east of a new roundabout but west of the old road, seems to be where that terminal was sited.

Belhelvie Sands 1817

8.1 km

Layton Hill	57 16 50.18	2 1 30.00	Wolff p21	NJ 986211	38
Tarbathy	57 12 43.18	2 4 7.30	Wolff p22	NJ 959134	38

Following a ruling by the Military Commissioners in 1811, no contemporary account of this measurement was published. Clarke reported in 1858 that the base was measured by Colby, there was no written account further than the contemporary notebooks used in the operation, and that the same chains and method of measurement were used as on previous occasions. Clarke described the two terminal stations but stated of Layton Hill ‘the exact station cannot be identified, as the ground has been cultivated and reclaimed’ and of Tarbathay ‘This station is situated on Tarbathay Hill...’. No trace of the exact site of the station is now in existence’.²⁵

The site today

Although the exact terminal station cannot be determined, it is still possible to stand on Layton Hill and look south over the sandy ‘links’, a primarily pastoral landscape with the occasional arable area – unmistakable yellow rape when I visited in early June.

Unfortunately the southern terminal is now completely lost. Tarbathay Hill is currently (unusually for a hilltop location) an active landfill site and the area is being resculptured. This hill grows daily in stature.

Lough Foyle 1827-8

12.7 km

Lough Foyle Base N End	55 9 6.08	6 56 53.63	Wolff p21	C 671343	3, 4
Lough Foyle Base S End	55 2 33.93	7 0 25.10	Wolff p21	C 635221	4, 7

Colby determined that the Survey’s work in Ireland was to have a firm scientific foundation. With the Survey having over 40 years experience in these matters, an extremely rigorous approach was taken. Proper terminal stations for a base were established, a circular space 30 feet in diameter on ground purchased for the purpose, but two additional stations also; one, at Minearny, where work concluded at the end of the 1827 season and the other at Mount Sandy, at the end of an extension established by triangulation.

²³ Mudge, W and Colby, T, 1811, *An account of the operations carried on for the accomplishing a trigonometrical survey of England and Wales*, Vol 3, in the years 1800, 1801, 1803-1809, London, Faden, p82.

²⁴ Clarke, p211.

²⁵ Clarke, pp25, 38, 206, 211-2.

Colby was dissatisfied with the effects that temperature variation had in the lengths of the chains used for previous measurements, in spite of the various correctional calculations employed. In the search for an improvement Colby himself came up with the solution of compensation bars. The bars were 10 feet 1½ inches in length and have been well described in subsequent literature, one conveniently accessible source is Owen and Pilbeam.²⁶

The bars were established on stands and between them were placed (simplifying considerably) six-inch bars with a microscope at each end. Sometimes just called compensation microscopes, these short bars were constructed on the same compensation principle but have been much less frequently documented.²⁷ Having secured alignment along the base, the microscope unit and the next bar were then adjusted laterally to ensure that the ‘null points’ on the compensation levers were aligned with the cross wires in the microscopes. Only one actual measurement then needed to be made in the field, (as opposed to checking the bars and the microscopes against standards to ensure consistency) and that was final one to the south terminal. This was an over-measurement of 8.496 inches. The final base measurement was then a multiple of the number of compensation bars used, plus the multiple of the compensation microscope bar measures, less the 8.496 inches.

The base was measured over three periods in a total of 60 days in 1827 and 1828.²⁸

1960

This base was remeasured by the OSNI in 1960 using the tellurometer. The terminal stations were uncovered and found to be in perfect condition. The 1960 measure was found to be greater than the 1827 measure by approximately one inch and this represents an agreement of better than 2ppm.²⁹ ‘The events of 1827-8 may therefore be regarded as one of Colby’s greatest triumphs’.³⁰

The site today

The North Base Tower, the South Base Tower and the Minearny Base Tower all still exist, are fully named and marked as triangulation points on current mapping (both OSI and OSNI) and can be visited. There is an illustration of the South Base Tower, in its suburban setting, in the Irish bicentennial volume.³¹ The Mount Sandy station has been lost to coastal erosion. A pair of compensation bars were given to the Science Museum in 1876; they are still there, though not on current display.³² Another bar was presented to the Irish Survey in 1923.^{33 34} I believe that the bars remaining in Southampton were destroyed in the air raids of 1940.

Lossiemouth 1909

7.2 km

Lossiemouth Base E term	57 40 56.50	3 10 49.23	Wolff p23	NJ 296664	28
Lossiemouth Base W term	57 42 43.94	3 17 12.88	Wolff p23	NJ 233699	28

²⁶ Owen, T and Pilbeam, E, 1992, *Ordnance Survey: Map Makers to Britain since 1791*, OS and HMSO, p28-9.

²⁷ Seymour, WA, 1980, *A History of the Ordnance Survey*, Folkestone, Dawson, Plate 9.

²⁸ Yolland, W, 1847, *An Account of the Measurement of the Lough Foyle Base in Ireland, with its verification and extension by triangulation; together with the various methods of computation followed on the Ordnance Survey, and the requisite tables*, Longman, Brown, Green and Longmans, especially pp 10-11, 24-29, 104-107, 152.

²⁹ Taylor, W R, 1962, ‘The remeasurement of the Lough Foyle base’, *Empire Survey Review*, **16**, (126), pp339-47.

³⁰ Seymour, p83.

³¹ *An illustrated record of Ordnance Survey in Ireland* 1991, OSI and OSNI, p18.

³² Personal communication, letter from Jane Insley dated 1 June 2001.

³³ Seymour, p233.

³⁴ *An illustrated record of Ordnance Survey in Ireland* 1991, OSI and OSNI, p17.

By the turn of the century concern was being expressed about the reliability of the Principal Triangulation and so it was decided to measure another base remote from both Lough Foyle and Salisbury Plain. A base was chosen on the southern shores of the Moray Firth and measurement was greatly facilitated by the discovery, in 1896, of invar, a nickel-steel alloy with a very low coefficient of expansion, which could be rolled into wires or tapes and used for measurement when suspended in catenary. In September and October 1909 the base was measured in sections, each section being measured three times, with 100 foot invar tapes. The crossing of the River Lossie was made by building a light wooden bridge for the observers (to prevent disturbance of the tripods which were on the bed of the river). ‘Unfortunately the very day when the bridge was completed the river came down in spate ... the bridge was practically swept away.’ Fortunately the river went down as quickly as it had risen, the bridge was re-erected and the measurement carried across.

In connecting this base to the Principal Triangulation it was realised that the extension was not as sound as desired (a number of the rays were taken from domelike summits) but it was concluded that the Principal Triangulation was up to the standard of more modern work in Europe and elsewhere.³⁵

1938

For the retriangulation, in addition to the main Ridgeway base, a check base, as far as possible from the Ridgeway, was desired. The Lossiemouth base was therefore remeasured using the same procedures as for the Ridgeway (see below). As in 1909, the main difficulties to measurement were crossing a canal and the River Lossie, but no spates on this occasion. The final measure differed from the 1909 measure by 11mm. In view of the fact that the two measures were carried out in totally different circumstances, with different procedures and apparatus and on the basis of different fundamental length standards, this was considered a very satisfactory agreement.³⁶

Thus the accuracy of the base measurement was confirmed but nothing could be done to correct or compensate for the poor quality of the extension into the triangulation from this location. A further base was desirable; some prospecting was done in 1939 but then weightier matters intervened.

The site today

Almost the whole of this base is mature pine forest. The East terminal is a non-standard triangulation pillar, flush bracket number 11093, being of normal height but a parallel sided concrete pillar 550mm square on a small plinth.³⁷ It is situated just inside the forest margin. I did not trace a marker for the West terminal but a small (mowed) grassy knoll stands in a clear area above, and surrounded by, back gardens on the fringe of Lossiemouth. The forest margin is just 100 metres away.

³⁵ ‘An account of the measurement of a geodetic base line at Lossiemouth’, 1912, [Johnston, W J and Henrici, EO, though the authors are not mentioned on the title page], *Ordnance Survey Professional Paper New Series* (1), HMSO. Copies of this *Paper* seem rather thinner on the ground today than one might expect for an item published by HMSO.

³⁶ Hotine, M, 1939, ‘The retriangulation of Great Britain: IV - Base measurement’, *Empire Survey Review*, **5**, (34) pp 211-25.

³⁷ In the *OS News*, 1992, (125), p10 – quoted in *Sheetlines* 35, p48, ref. 30 – the writer was hardly accurate when they put ‘The forerunner of the modern trig pillar ... was a dumper, cylindrical version, the first of which was constructed on the Lossiemouth base in 1912’.

Ridgeway 1937**11.3 km**

White Horse Hill	51 34 29.87	1 33 57.03	Retriang p360	SU 301864	174
Liddington Castle	51 30 56.98	1 41 51.31	Retriang p370	SU 210798	174

The Salisbury Plain base was considered for the retriangulation but was rejected for a variety of reasons, primarily because of the lack of intervisibility of the terminal points and the consequent need to erect a scaffold at Old Sarum. A base was chosen along the Berkshire Ridgeway between two primary stations. This site provided a rapid well-conditioned connection straight into the primary network and the base terminals themselves were sharp clean features.

The base was measured in the late autumn of 1937 using three new but artificially aged 24 metre invar tapes suspended in catenary. A deep ravine was measured both by triangulation and by using the tapes on the very steep slopes (40°) and the results agreed well. Crossing the prehistoric entrenched systems close to the terminals, the wind screens had to be flown up to the tapes on guys as the gaps always seemed to canalise the wind.^{38 39}

1951

It was decided to remeasure the Ridgeway base as a training exercise before measuring the difficult Caithness base. Invar tapes were again used but there had been changes to the equipment and almost all the personnel were new, so it was desirable to test both under field conditions. The measurement across the ravine on this occasion was also done directly by the use of Bilby towers. Visitors to the Ridgeway were restricted to just two days. The observers were sworn to secrecy, an old set of tapes was used and a complete fake set of measurements produced, just for demonstration purposes, without any of the visitors being any the wiser; thus was the integrity of the true measure preserved. The final accepted length differed from the 1937 measure by 6.6mm, a very satisfactory agreement.⁴⁰

1953

When, in Caithness, the light nights defeated the geodimeter (see below), it was brought south to the Ridgeway. The measurements were completed satisfactorily, with the US staff, who had to return home, training British staff to use the equipment.⁴¹ So consistent were the results, particularly for the Ridgeway but also for Caithness, that it was thought more likely that the velocity of light *in vacuo*, on which they were based, was in need of revision than that the geodimeter measurements themselves were appreciably in error.⁴²

1957

The tellurometer is an instrument for determining the distance between points by measuring the transit **time**, outward and return, of radio microwaves emitted from a master station situated at one point and retransmitted from a remote station at the other. It was invented by Dr Wadley of South Africa.⁴³

³⁸ Hotine, M, 1935, 'The East African Arc: IV - Base measurement', *Empire Survey Review*, **3**, (18) pp203-18.

³⁹ Hotine, 1939.

⁴⁰ Cobb, M H, 1953, 'The measurement of the Ridge Way and Caithness bases 1951-2', *Ordnance Survey Professional Paper New Series*, (18), HMSO. Also on microfilm: HMSO Publications 1922 - 1972, reel 2046, 1953, p179, item 6.

⁴¹ Mackensie, I C C, 1954, 'The geodimeter measurement of the Ridge Way and Caithness bases 1953', *Ordnance Survey Professional Paper New Series*, (19), HMSO. Also on microfilm: HMSO Publications 1922 - 1972, reel 2124, 1954, p943, item 7.

⁴² Edge, R C A, 1956, 'New determinations of the velocity of light', *Nature*, **177**, (4509), pp618-9.

⁴³ The history of the retriangulation of Great Britain, 1967, HMSO, p157.

During April 1957 the base was measured four times in each direction, together with further measurements to local primary stations. Extremely consistent results were obtained and the results, using the taped measure of the base as accurate, taken forward to calculate a revised figure for the velocity of light (corrected to in a vacuum). This figure, together with other independently obtained figures, was then used later for the revision of the international standard.^{44 45}

The site today

A standard triangulation pillar, flush bracket number 2987, stands on the outer rampart of Uffington Castle, atop White Horse Hill. White Horse Hill was one of the eleven stations from Figures 1 and 2 of the Retriangulation which was identical in location with Clarke's Principal Triangulation. (The combined figure was adjusted to give the best fit with the Principal Triangulation at these 11 points). The pillar is part of the current GPS network and carries the standard plaque (160mm × 70mm dated July 1999) to this effect. The surrounding area is adorned by management signs from both the National Trust and the Ministry of Works.

Liddington Castle has a standard triangulation pillar, flush bracket number S1268, and, at 277m, is the highest point of any of the bases discussed in this article. The pillar has at some stage had a 300mm × 200mm plaque on it, but this is now missing. The area surrounding the foundation of the pillar is much eroded (probably by sheep – some 500mm of the foundation is exposed) but a banner on the field entry gate to the Castle states that Heritage Lottery funding has been used on the site and it is presumably this that has led to a little stabilisation work, both around the trig point and in other places.

The base is now broken by the M4 but an overbridge carrying a minor road and the Ridgeway bridlepath must lie very close to the line of the base. The bridlepath itself provides a good walk, in clear weather, between the two terminals.

Caithness 1952

24.8 km

Warth Hill	58 36 45-09	3 04 57-01	Retriang p369	ND 371699	12
Spital Hill	58 28 53-03	3 25 38-51	Retriang p369	ND 168556	11,12

It was to be 1951 before a location for a new northern base was finalised. Caithness was chosen and this base had much better links into the triangulation than those from the Lossiemouth base. However the surveyors were to encounter here just the same difficulties with boggy terrain that had been experienced on Sedgemoor 150 years earlier; albeit rather more successfully overcome. In the preliminary survey the maximum depth of the peat bog was measured at 21 feet.

Work commenced after Easter 1952 and was completed by the end of June. In the boggiest areas the measuring head tripods were placed on an A frame, which rested on pickets. The observers, using a leapfrog technique, approached over duck boards and their weight on the A frame always exerted a force at right angles to the tape. The straining trestle heads were set much further back than normal, with 4½ metres of piano wire between the

⁴⁴ Wadley, T L, 1957, 'The tellurometer system of distance measurement', *Empire Survey Review*, **14**, (105), p100-11, (106) p146-60.

⁴⁵ Kelsey, J, Edge R C A, 1958, 'Trials of the tellurometer carried out jointly by the Ordnance Survey of Great Britain and the South African Council for Scientific and Industrial Research', Paper presented to the 11th General assembly of the International Union of Geodesy and Geophysics, Toronto 1957, *Bulletin G  od  sique*, (49), pp1-15.

tape and the weight. Section markers were established in the firmest locations available, usually streambeds, and then sections were completed in the same day. The Director General was the only visitor who reached this site.⁴⁶

1953

A geodimeter uses a pulsed lightbeam to measure the distance to a distant reflector. The pulse frequency is accurately controlled, the distance to the reflector being deduced by the **distance** by which the returning pulses are out of phase with those emitted.⁴⁷ The geodimeter was invented by Dr Bergstrand of Sweden (and manufactured by Aga).

The Ordnance Survey was asked to test the geodimeter over a baseline by the US Army Map Service. There were no suitable bases in the USA as most of their bases had been measured along railway lines in virtually flat country. Personnel and equipment went north to Caithness in June 1953. What nobody had realised was that the light June nights in that northern clime meant that the equipment (which turned out to require total darkness) would not operate. (Presumably the Swedes would already have known this; perhaps they hadn't thought it necessary to enlighten a customer based mainly south of the 49th parallel). It was sent back south for use on the Ridgeway (see above) and then returned north in August.

The equipment performed satisfactorily second time round and it was also used to measure the side Saxavord - Fetlar.⁴⁸ (Saxavord, on Unst, is the most northerly primary station of all.) Since the Caithness base was about the maximum range of this equipment and with its limitation to darkness hours, the geodimeter was then returned to the States with thanks.

1957

Tellurometer measurements were made of this base in May 1957. Unfortunately measurements over the full base showed excessive ground reflection. There was however a central station and measurements were made of the two halves of the base separately. The results were consistent with the taped measure for the base but not deemed sufficiently sound to be taken forward into the velocity measurements.⁴⁹ The tellurometer proved much more suitable for everyday service than the geodimeter and was adopted for regular use from this period onwards.

The site today

I have not been able to visit this base and a report from any member who is able to visit this area would be welcomed. The *Landranger* map shows a 'coniferous wood' covering over 1 km of the base.

Acknowledgements

I would like to thank, Mr Bennett of Cannon Close, Nick Krebs, David Ride, David Watt and particularly Brian Adams for help received in the preparation of this article.

⁴⁶ Cobb.

⁴⁷ *The history of the retriangulation of Great Britain*, 1967, HMSO, p140.

⁴⁸ Mackensie.

⁴⁹ Wadley.

The Cotswold Method: a personal recollection

Phil Budd

Surveyor training, back in the 1970s, did two things, one was to turn out competent surveyors, the other was to inculcate a sense of history. We were not merely graphic surveyors, we were part of the lineage that stretched from William Roy through teams of anonymous sappers to us, perhaps a little less military in bearing than our illustrious predecessors, but nonetheless part of that heritage. Our instructors to a man were ex Royal Engineers, NCOs with a fierce pride in their history and an equally fierce approach to instructing. Those of us that survived the robust basic training left with a confidence bordering on arrogance and a naivety bordering embarrassment. We were blissfully unaware of either state, a protection that only youth and inexperience provides.

Wet days were anathema. Confined to the office. Condemned to reading aloud passages from the Red Book, "Areas of mud will be annotated 'mud', m u d." To break the monotony there were the occasional visits to other areas within the survey's family; draughtsmen, distant cousins with troglodyte tendencies, Air Machine, brother surveyors serving time for undisclosed transgressions, and in a small room in North Block, as it was then called, were the Cotswold team. The preamble was couched in such terms as *precision, judicious selection, intimate appreciation of the scale's limitation, incremental equation, imperceptible*: words and phrases that impressed upon us the near surgical procedures of recasting County Series mapping to National Grid lines. There was not much to see on entering the room, but slowly through the smoke fug appeared two knife-wielding pensioners, perhaps a little too pleased with our arrival. They did not get out much it seemed. They eagerly demonstrated with arthritic dexterity their ability to create tangrams from perfectly good maps. The reassembled pieces would become the Master Survey Document. The reassembled pieces resembled pack ice.

On completion of basic training, I was released into the waterlogged wastes of the Somerset Levels. I was to revise a village not far from Cheddar, Lower Weare, easy, flat, no problems with aerial photography. A simple stroll round, collecting names, a few confirmatory measurements and on to the next job. From the photographs I had identified changes in the course of the River Axe, which flowed through the village, not surprising in that the maps were decades out of date. I had not traced the new routes from the aerial photograph, as it was difficult to get a good fit, due so I thought, to the indeterminate nature of the riverbank. It soon became obvious that the river was too narrow, not a small amount but several metres too narrow. No problem. No problem? I started to move sizeable parts of Somerset towards the Bristol Channel in one direction and up the scarp slope of the Mendips in the other. I knew this was a simple job, set aside for the new boy, but something had gone hopelessly wrong, I could not resolve it. I also could not admit it.

All enthusiasm evaporated. What confidence I had was gone. Two days on the job, I had been found out, no aptitude, no 'ground sense'. I was to be visited that day, on the ground; the chief surveyor wanted to meet the new boy. It was all up, I would confess. "I've a problem with the river. It's too narrow." "Cotswold cut." Too brusque, almost dismissive, could he not see it is too narrow? But that was the point, you could not see it, what could be seen was my dismay. From the corner of his mouth came the one piece of advice never imparted at the training school, "If it looks ***** right, it is ***** right", as he sketched the

bend in the river that I had failed to survey in two days. Sketched. I checked it out, it looked right, I put a 'shot' across it, close enough. Sketch maps, that's what it came down to, freehand doodles. From enthusiast to cynic in two days, that's the Cotswold method.

Time and tide may wait for no man but technology does. What was an acceptable compromise yesterday becomes today's 'fudge', what was invisible to the naked eye is glaringly obvious with GPS, but the same technology that lays bare the 'Cotswold' inadequacies can also rectify the situation. There is now a national programme for positional accuracy improvement for 1:2,500 mapping. This may well see 1:1,250 levels of accuracy for rural towns. This will probably be achieved in three years, our customers will sit in on the Joint Working Group and their interests will be met. Every one wins eventually, but me. The River Axe may well flow between banks accurate to ± 0.4 m. with no seismic shift in Somerset's position but you cannot replace youthful idealism quite so easily.

Phil Budd joined the Survey in 1975 as a basic grade surveyor, stationed in Weston-super-Mare and Bristol Fishponds, where he was paid to ramble over the Mendips during the glorious summer of 1976, before painful conversion to draughtsman / cartographer in 1977. Subsequently he has worked in most areas of cartographic production (including fair drawing 1:2,500 maps!) and is currently employed on the Explorer / OLM reformatting program.

This article resulted from a suggestion from Andrew Tatham to Steve Erskine, following a discussion at the former RGSOS Education Consultative Committee of the need to record the oral history of the OS. The Editor is extremely grateful to the author, and to Andrew and Steve for making possible such a vivid account of a little known, but important, subject. Similar contributions from others with OS experience are very much encouraged.

The distorting mirror of history¹

Aidan de la Mare

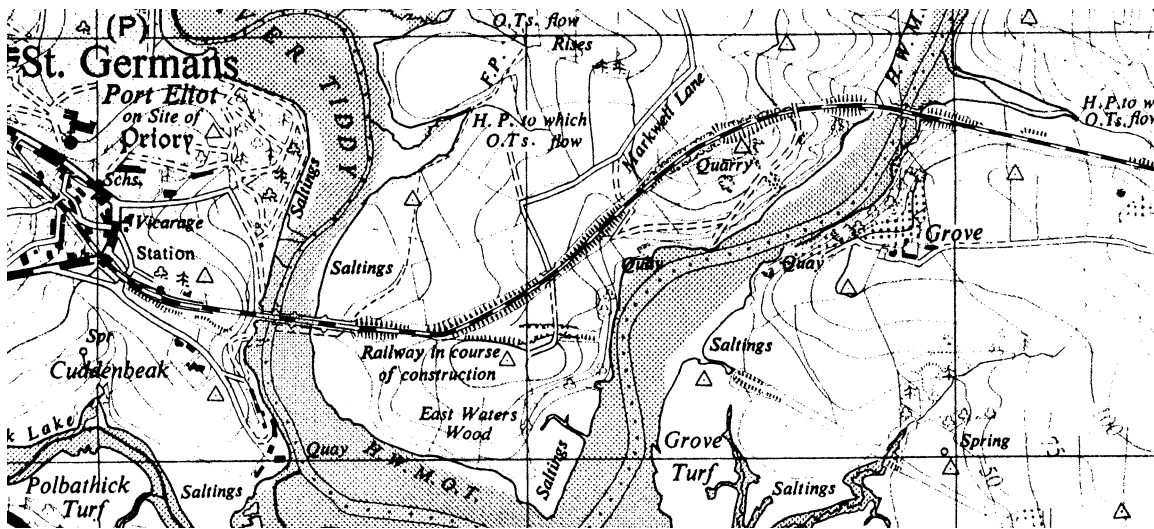
One of the pleasures of being on the amateur fringe of the Charles Close Society is that one can, without causing discomfort or annoyance at Maybush, search out anomalies and anachronisms on old editions and printings of Ordnance Survey maps, and share these with other members through the pages of *Sheetlines*.

A buyer of 1:25,000 sheet 20(SX)/35 when it came out in 1946 would have found the rather unusual entry 'Railway in course of construction' on the Great Western main line at St Germans, just west of Plymouth in square 3657. Those who knew the railway at that time might have been surprised at the lack of activity there, and those who did not know it might reasonably have supposed that it was war damage, of which there was much in the Plymouth area, that was still being repaired.

The reality goes back to the building of the Cornwall Railway in the 1850s when Brunel laid out the line through the difficult country between Plymouth and Truro. Shortage of money and the need for many viaducts dictated the use of the famous timber structures so closely associated with Brunel's name. As the years went by the burden of replacing rotting

¹ With apology to Dr Tim Nicholson's fascinating occasional series 'Mirrors of History' in *Sheetlines*.

timbers grew, but as money became available the viaducts were steadily replaced by more permanent structures. The last major work on the Cornwall Railway, by then taken over by the Great Western Railway, was the four mile deviation from just west of the Saltash Bridge to St Germans which cut out three large and two small timber viaducts.²



The map (print code 15046) is very coy about its origins, only admitting that it was 'Printed and Published by the Director General of the Ordnance Survey Office, 1946', but reference to the neighbouring Sheet 20/25 which I bought at the same time as 20/35 reveals how this anachronism came about. By the B printing of 1950 the OS had admitted that the maps were 'Compiled from 6" sheets last fully revised 1905. Other partial systematic revision 1938-48 has been incorporated'. So I took a look at the 1907 edition (revised in 1905) and subsequent printings of the six-inch sheet 45³ which revealed how this 'Railway in course of construction' came to be there.

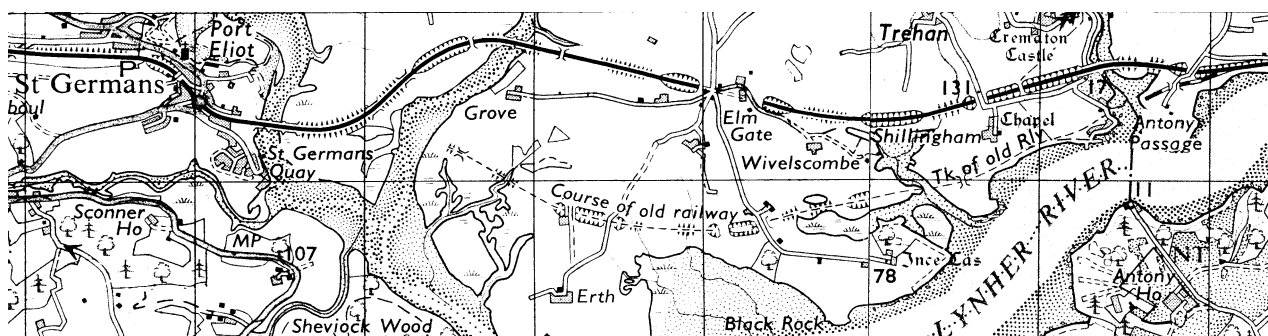
The St Germans viaduct happens to be at the point where the four quarters of sheet 45 meet. The NW quarter shows the railway as double track from the western edge of the map to St. Germans station and single from there to where it goes off the map, which was correct for 1905 when the map was revised. The SW quarter shows only a very short stretch of single track across the old St. Germans viaduct but also the earthworks accompanying the building of the new viaduct along side the old and the annotation 'Railway in course of construction.' Also correct for the same date, but both these two quarters remained unrevised at least up to 1942, the date of the maps seen.

The NE quarter of 1907 shows discontinuous areas of land where the deviation was being built, but no track yet laid. However this quarter was revised in 1919 when the deviation was correctly shown as a double track up to the edge of the map. The SE quarter of 1907 shows the old course of the single track railway still in use looping south close to the Lynher River and leaving the map just to the east of the St Germans viaduct. This quarter was also revised in 1912 when the old line is shown abandoned and the viaducts removed, also correct for that date.

² 'Brunel's Cornish Viaducts' by John Binding, Pendragon Books, 1993.

³ Held at the Cornish Studies Library at Redruth.

So it seems that the 1:25,000 sheet was prepared uncritically from the six-inch composite full sheet 45 with its various revisions. What appears on the map purporting to be a state when work was in progress on the new St Germans viaduct and with the new deviation open to traffic, was a state that never actually existed as all the works were completed and opened to traffic as double track in 1908. So this snapshot of a state of the Cornwall Railway in the course of its development is not only inaccurate but it arrived for sale to the public forty years late!



Course of old railway from One-inch Seventh Series sheets 186(C, 1972) and 187(A/*, 1961).

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Maps for all seasons

Stephen W Simpson

Last summer large numbers of maps were produced to show the post foot and mouth opening of footpaths in Cumbria. These are, I think, a co-operative effort between the County Council, the National Park Authority, the Cumbria Tourist Board and DEFRA (MAFF as was). I believe the cartography was by the County Council.

One map in this series, produced on an A3 sheet folded to make a 1/3 A4 brochure, showing the whole county has caused some comment. A letter to editor of the Penrith paper, *The Cumberland and Westmorland Herald*, made the writer's feeling clear to all. It is not often that a map causes such passion – a disagreement in some parish council or other but not a map! The reason for all the heat was the colour scheme chosen. Those areas where footpaths were still closed are shown by a blue tint; those in which they were open are uncoloured but are criss-crossed by many blue lines. These lines, which resemble the crazed glazing sometimes seen on old pottery, are also blue and represent the footpaths.

The correspondent of the local paper saw red because as everyone knows blue should only be used on maps to represent water.¹

Another seasonal map from the same source fell through our letterbox a few days ago. *Winter Driving in Cumbria: Ice and snow gritting service 2001/02* is an interesting map with no scale or other regular cartographic detail. Once again the interest lies in the colour scheme. The road network is shown in ochre, red, blue and black. Ochre, trunk roads, 'are

¹ Larger maps of specific areas, based on Ordnance Survey 1:50,000 and 1:25,000 mapping, have also been produced to be displayed in Tourist Information Centres. These also use blue to represent open and closed paths.

not the responsibility of Cumbria County Council' but will be gritted within three hours. Red are 'First Priority Roads (gritted with in 3 hours)' and blue 'Second Priority Roads (gritted with in 5 hours)', this category includes A, B and other roads. The few black roads, with no priority, are the remaining A and B roads that parallel routes in one of the other three categories. Roads that are not shown may or may not be treated. Text gives full details of the gritting service and the numbers of all the roads to be treated including C and U class roads.

As a matter of interest the sea and lakes are blue and areas outside the county have a ground pattern in shades of buff and ochre. Roads outside the county are shown in black.

The unconventional colour scheme shows the service well and, by not using the more conventional colours, green, red, brown/yellow for MoT classified roads, saves confusion. This all goes to show that sometimes conventions are best forgotten when they get in the way of the information.

A man who was passionate about maps: Alfred Wainwright, 1907 – 1991

Chris Noble

Alfred Wainwright became widely and popularly known through the screening of *Wainwright's Walks* on TV in the 1980s. Although he was an unusual, perhaps in some respects an eccentric and reclusive man, he was already known to many who loved walking on the mountains and hills of northern England. The first clue to my wanting to write about him for the readers of this esoteric journal comes in the dedication from his first published book: 'DEDICATED TO THE MEN OF THE ORDNANCE SURVEY whose maps of Lakeland have given me much pleasure both on the fells and by my fireside'.¹

Many similar books followed, including what must be regarded as classic descriptions of the Pennine Way, *Pennine Way Companion*², and his own pioneering journey, *A Coast to Coast Walk*³. These, like his other Westmorland Press edition journals, were all copies of his hand-written commentary, with his sketch maps and his drawings of scenes along the route. Always included was his table of 'symbols and abbreviations' or 'sign references', in which he supplied a more detailed key to the terrain and landscape than the OS legend.

But Wainwright's first account of a long walk was, in its publishing date, one of his last. *A Pennine Journey: the story of a long walk*⁴ was first published in 1986. Although it followed over thirty earlier publications, it could, perhaps should, have been his first. It is the basis of this note in which I would like to share my pleasure at the recognition of someone who could be a posthumous honorary member of the Charles Close Society. This account was not, like all his later books, illustrated with his drawings and maps of the countryside through which he was travelling. There is only one spidery sketch map of his route. But he refers throughout his travels to the Ordnance Survey maps which he carried.

¹ *A Pennine Journey*, Michael Joseph, 1986 (also Penguin Books).

² *Pennine Way Companion*, Westmorland Gazette, 1968 (also Michael Joseph).

³ *A Coast to Coast Walk*, Westmorland Gazette, 1973 (also Michael Joseph).

⁴ *A Pennine Journey*, Michael Joseph, 1986.

In 1938 Wainwright planned to spend a late summer holiday from his job in the Blackburn Borough Treasurer's office walking to Hadrian's Wall. Travelling by train from his home town, Blackburn, to Settle, he set off on 24 September to walk north, crossing the dales which divided the eastern Pennine fells to reach Hadrian's Wall north of Hexham. He then walked west along the Wall as far as Haltwhistle where he turned south to follow the western Pennine fells back to Settle, arriving there to return home on 3 October, 1938. While he walked, Neville Chamberlain was reaching his infamous agreement with Adolf Hitler at Munich, an event Wainwright frequently refers to in his account.

He took with him five Ordnance Survey maps which he mentions throughout his account: I believe they must have been sheets 6 (Hexham), 10 (Alston and Weardale), 13 (Kirkby Stephen and Appleby), 20 (Kirkby Lonsdale and Hawes) and sheet 25 (Ribblesdale) of the OS One-inch Popular Edition, linen mounted.⁵ He writes: 'My map becomes not a square of coloured linen, but a picture of the country itself'.⁶

Wainwright's first reference to his maps that we can identify today is: 'I had walked off the top of my first map at Horton, and now, at Muker, I was near the top margin of the second'.⁷ These would have been sheets 25 and 20 respectively. But before that extract Wainwright had written his eulogy to maps, nearly two pages of praise. And not just maps, it is plain that he is talking about what he calls 'ordnance maps'.

Some extracts: 'Give me a map to look at and I am content. ... Old maps are old friends, understood only by the man with whom they have travelled the miles. ... The older, the more tattered it is, the greater my affection for it. ... Map-lovers are few, book lovers are many, yet I think the reward of the lover of maps is far and away the greater. If it is ever my lot to be cast away on a desert island, let it be with an atlas and a one-inch map of the Lake District'.⁸ Of course he couldn't have imagined that almost exactly fifty years later he was to be cast away on a Desert Island by the BBC.⁹

A little later, after an account of how he reads his map he says: 'I can imagine only one pursuit more fascinating than map-reading, and that is map-making'.¹⁰

On the third day he reached the shelter of the Tan Hill Inn, finding that it is already, in 1938, calling itself 'England's Highest Inn' and there he describes an encounter with the son of the innkeeper that should please any Charles Close Society member: 'the young man had asked, shyly, if he might look at my map, and studied it with a childish absorption. Probably never before had he seen his home on a map, nor been able to see, as in a picture, its relation to the few other farms and villages he knew. Here he had an aeroplane's view of the countryside he lived in, and it was a revelation to him. Roads he knew in part would here be traced in full, and for the first time he followed their course to the distant places he had heard of but never visited. Not until I was pulling on my cape did he hand it back to me, half-apologetically, and the new interest in his eyes made me wonder if, in this unlikely spot, I had met a kindred soul'.¹¹ What an image that creates of the excitement of the first sight of an Ordnance Survey map!

⁵ With thanks to fellow Charles Close Society member, Lionel Hooper, for letting me consult the three copies of these maps that I do not possess.

⁶ *ibid.*, p. 42.

⁷ *ibid.*, p. 43.

⁸ *ibid.*, pp. 41-42.

⁹ *Desert Island Discs*, BBC Radio 4, 4 September 1988.

¹⁰ *A Pennine Journey*, p. 47.

¹¹ *ibid.*, p. 49.

Travelling further north, Wainwright finds he is confused after having to leave his map as he heads for Bowes, and is teased by a farmer who tells him that the great building he sees ahead is the new air-raid shelter, finally admitting it is actually Bowes Castle. 'Bowes was unfortunately just off the side edge of my map.'¹² Bowes Castle is one inch – one mile, off the edge of sheet 13.

Noting that he has, just north of Newbiggin, walked off the top of his third map (sheet 13) he comments that he has now reached the point at which he is level with the northern edge of his beloved Lake District, the flanks of Skiddaw.¹³ Wainwright is by now heading for Blanchland, and comments that his map shows only a rough path between Rookhope and Blanchland: he finds there is a new motor road, along which, purist that he is, he refuses a lift from a passing car. Popular Edition sheet 10, published 1925, shows only the faintest impression of an unfenced 'bad' road crossing the high moors. So it was just as he says.¹⁴

Wainwright's return south was less happy, encountering awful weather and less welcoming people, except for his night at Gamblesbury, the best, he says, though the most expensive at eight shillings for dinner, bed and breakfast. For some reason which he doesn't explain, he travels south taking a route lying west, away from the Pennine fells. Perhaps his even more beloved and often mentioned Lakeland fells drew him westwards towards them.

On his last day he passed and admired Thornton Force. Wainwright would have appreciated the cover of the latest *Landranger*, edition B, with its cover photo of Thornton Force. But what happened to Malham Tarn pictured on the earlier edition? Leaving the valley he gave an old man sixpence, paying, as we pay today, to visit Ingleton Falls.

He returns to Settle, tired but elated, and bearing his five precious though battered Ordnance Survey maps. I wonder if any of them survive?

A Pennine Journey is not mentioned in his autobiographical account, *Ex-Fellwanderer*.¹⁵ Curious, as the latter's date of publication was six months later than the former. Here Wainwright also records his love of the Ordnance maps when, speaking of his growing loss of sight, he tells us: 'It first became apparent when I found difficulty in deciphering the small print and symbols of Ordnance maps, always my favourite literature. ... I still sit for hours with familiar maps open in front of me. I know them so well that even the loss of detail doesn't matter, even as a blur they evoke vivid memories of happy wanderings.'¹⁶ He described his first visit to the Lake District in 1930, with a map which he later reveals is an Ordnance Survey edition. In a later comment he reveals one of the sources of his detailed knowledge of the area: 'I had a set of old Ordnance maps, 1901 edition, on a scale of six inches to a mile: these were issued when many of the mines and quarries were still active and showed the cart-tracks and sledgates and miner's tracks that have since fallen into disuse.'¹⁷

I haven't mentioned the fantasy girls of his dreams who accompany Wainwright throughout his journey, nor his reactionary social commentary, nor his unabashed 'sexist' remarks. His disdain for walking in groups, one (silent) companion is his absolute limit, nor his extraordinary claim to have taken little more than his cape, a few pairs of socks, his camera and cigarettes. That's another story. Evidently his five maps met every need!

¹² *ibid*, p. 51.

¹³ *ibid*, p. 61.

¹⁴ *ibid*, p. 66.

¹⁵ *Ex-Fellwanderer*, Westmorland Gazette, 1987.

¹⁶ *ibid*, second page of text (not numbered).

¹⁷ *ibid*.

Touring map Lake District & Cumbria and its competitors

A description and review

Stephen W Simpson

When I offered to review the new *Touring map Lake District & Cumbria* for *Sheetlines*, I thought it would be a simple task. I had a copy of the map and almost every edition of the old Tourist Map, and Chris Board had reviewed its ‘parent’ the *1:25,000 Road Map*¹. However, when I thought about the map and the market place in which it is sold I came to the conclusion that it could not be reviewed in isolation from the other maps with which it competes. My starting point was to buy some of these maps, so off I went to the local motorway service station, at Tebay on the edge of the Lake District. They sell a number of tourist maps but the only Ordnance Survey products available are *Outdoor Leisure Maps*. A second outing took me to a branch of a national bookseller where the choice was much larger.

The number of maps and guides offered to visitors to the Lake District is enormous, if not bewildering. Maps are offered in a wide range of scales, styles and formats. Some are intended for specific markets and compete with the *Outdoor Leisure Maps*; these I have disregarded. Those intended for the general (motorised) tourist are the subject of this review.

The maps chosen for comparison with the Ordnance Survey’s *Touring map Lake District & Cumbria*, 9 cm to 10 km – 3 inches to 5 miles, price £3.95, are:

Cumbria The Lake District Touring Map, 2½ miles to 1 inch – 1.6 km to 1 cm, Cumbria Tourist Board, price £3.95.

Lake District, 1:188,000, FlexiMap, Insight Map, price £4.99.

Leisure Map Lake District, 1:75,000, Estate Publications, price £4.45.

A – Z Visitors’ Map of Lake District, 1 inch to 1 mile, Geographers’ A - Z Map Company Ltd., price £3.75.

These maps were chosen because the covers, branding and price indicate that they are intended to be attractive to the general tourist. From the above it will be seen that a wide range of scales are used, some decidedly odd and others obsolete.

Touring map Lake District & Cumbria. Ordnance Survey

Ordnance Survey’s *Lake District Tourist Map* has a long history that can be traced back over a hundred years to *The Lake District (1900)*² and possibly to the *Lake District of Cumberland and Westmorland with shaded contours (1870)*³. Since that time there have been many changes reflecting the development of its one-inch and 1:50,000 ‘parents’ and the need of its users. The modifications included enlargement of the map area and changes in cartographic specification, from black outline with coloured roads and water to its last magenta riddled incarnations. Throughout these changes, the *Lake District One-inch Tourist Map* gave the impression of being a single evolving map. This new map breaks that tradition and takes a new direction.

¹ *Sheetlines* 61, 11–13.

² R Hellyer *Ordnance Survey small-scale maps: indexes 1801 – 1998*, Kerry, David Archer, 1999.

³ *ibid.*

Since the advent of the 1:25,000 series and in particular the *Outdoor Leisure Maps*, Ordnance Survey's tourist maps have been subject to a number of experiments; in most cases these have made the maps less attractive cartographically and won them few fans in the Charles Close Society. However, they seem to be commercially successful. The introduction of the *Explorer Series* and new *Outdoor Leisure* sheets, on enlarged and adjusted sheet lines, mean that Cumbria is now covered by fourteen sheets at 1:25,000; the Lake District National Park by the four enlarged *Outdoor Leisure Lake District* sheets and one *Explorer*, sheet 303, *Whitehaven & Workington, Cockermouth*. These, along with similar products of other mapmakers, aimed primarily at walkers, left the *Lake District Tourist Map* as a less than ideal product to meet the needs of the general tourist.

Turning to the *Touring map Lake District & Cumbria*, the cover is bright and attractive with a view of Friars Crag, Derwent Water and an inset of Ashness Bridge, harking back to the short-lived *Lake District One-inch Tourist Map* of the early 1970s⁴. A scarlet panel includes the title, Ordnance Survey logo and web address. With the exception of the web address, this information is repeated on the spine. The back cover is a variation of Ordnance Survey's standard offering with a diagram of the area covered, series index, the usual bar code, copyright and other Ordnance Survey information. The area diagram shows National Parks, Areas of Outstanding Natural Beauty, the county and national boundaries and important towns. The line of Hadrian's Wall might also have been included, given its status as a World Heritage Site.

The back cover also includes the first indication that all is not well, in the form of the scale statement '9 cm to 10 km – 3 inches to 5 miles'. In other words 1:111,111.11', not a common scale. The reason for the choice is clear, at its widest point, St Bees Head to Stonesdale Moor, the county fits neatly within the map border and this is the largest possible scale given a fixed paper size and county area. The scale panel on the face of the map clarifies(?) the scale by stating that it is '...approx 3 inches to 5 miles'. It also tells us that one grid square is 10 kilometres.

On opening the map one is presented with a good, large, clear road map at well over twice the scale of the *1:250,000 Road Map* from which it is derived. It is not just a simple enlargement, for instance some place names are moved, but overall it incorporates, and in some cases compounds, the failings of the *Road Map* highlighted by Chris Board⁵. There are also some improvements.

The conventional signs panel is not simply a rearrangement of the *Road Map's* to fit the space available: there are some new symbols, while others are omitted. In the latter case this may be because these features do not appear on the map, for example 'Track rapid transit' or may represent a new standard: roads under construction, for example, are shown in only one state by a cased pecked line of the colour appropriate to the class of road. New symbols are used to show 'services' on primary routes and main roads (see below); the single symbol 'Aerodrome with/without customs facilities' is replaced by three 'Airport with scheduled flights, with/without customs facilities' and 'Airport with non-scheduled flights with customs facilities'.

Under the heading 'Customer Information' one is told that the map is 'Fully revised to February 2001' with 'Motorways and selected major roads revised to March 2001', also the publication date, clearly this is an up to date map! But no, substantial plantations are not

⁴ *Lake District Tourist Map* (Seventh Series) 1970, H133.

⁵ *ibid.*

shown; some near the A6 that I know to be at least thirty years old are missing, Ordnance Survey seems to have a blind spot so far as these woods are concerned, they have not made it on to the much-revised *Outdoor Leisure* sheets either. Further south the wind generators, said to be the largest in the kingdom, beside the M6 on Lambrigg Fell are also omitted. To my knowledge, they have been there since 2000. I suspect that detailed examination of the map and the ground would produce many more instances of patchy revision.

On a brighter note, the roads do seem to be bang up to the minute, particularly in terms of the Primary / A road classification. However, if a tourist wants a bed for the night he might be disappointed by the application of the symbols on the map, no matter how clear they may seem in the description. Can anyone tell me why a white petrol pump, fork and knife on a black field are used to indicate 'other services with motel' and the same symbol in reverse, black on white, indicates 'other services'? Particularly when the more conventional bed symbol is used to represent 'motel'. Surely, the former symbols might be a better indication of twenty-four hour and not twenty-four hour services. Perhaps a petrol pump alone on a black field could be used to indicate twenty-four hour filling stations and the reverse to indicate filling stations open for shorter periods in rural areas. This information would be very useful to many drivers.

The application of these symbols is even more puzzling; the services at Burton-in-Kendal and Killington both shown as having a motel (the bed symbol is used) while those at Tebay and Southwaite services are not. In fact, all have motels, as do the services west of Penrith on the A66, but this is not indicated on the map, and the non-motorway services at Tebay off the A685/B6260 are not shown at all.

Another puzzle is the inclusion of a miniature road sign to represent 'areas of steep road gradients'; it is always accompanied by a rash of 'gradient steeper than 1 in 7' chevrons but is not used in all instances where it could be, for example in squares C11, D11 and D12. Might it not be better used to indicate long steep hills at less than 1 in 7, for example in squares G10 and J10? The climbs over Shap and Ash Fells are both long and hard though neither is as steep as 1 in 7.

Continuing with the conventional signs why are tree symbols used when they serve no purpose and why do National Cycle Routes end at the county boundary? And what about way-marked recreational cycle paths such as the Cumbria Cycle Way? The Pennine Way, a National Trail, is shown and extended outside Cumbria but a number of way-marked recreational paths are not. I accept that a map at this scale is not intended for walkers but it might be of value to cyclists and for walk planning, coming close as it does to the much discussed 1:100,000 scale. It is possible that some tourist might like to get out of their cars on easy, way-marked paths such as that following part of the route of former Penrith to Keswick railway.

'Other antiquities' are shown in one font, *Old English*, in the conventional signs panel and an entirely different one, *Chancery*, on the face of the map. This fault is carried over from the *Road Map* and one would have thought Ordnance Survey could have put this right on a new map, even if it were spotted too late to be changed on the *Road Map*.

Then there is the representation of relief. All Chris Board's strictures apply, except that there is no hill shading and the spot heights are in metres!⁶ However, what is the use of layers when the colours are so indistinct as on this map? On the *Road Map* the layers coincide with

⁶ *ibid.*

contours, omitted on the *Touring map*, which in mountain areas at 1:250,000 tend to obscure detail but at the much larger scale would help delineate the layers that otherwise disappear into each other.

There is no indication of the 'North Points' and none of the information is translated so are we to assume that the French and Germans have no interest in any of it?

The table of 'Tourist Information' (like 'New York, so good they named it twice') seems very helpful, and in terms of what it includes it no doubt is, even to the French or Germans; here everything is translated. However, what looks good in the table is applied patchily to the map. What a good idea to show pubs and WCs for afterwards. Not if you travel on the A6 between Kendal and Penrith. There are seven public houses (excluding two at Eamont Bridge that might be omitted on the grounds that they are in 'greater' Penrith) and what about those at Bampton Grange, Bampton, Helton, Askham and Tirril? None are shown. If you do find a pub, you could be caught short in Shap or Orton; both have WCs that are not indicated.

If you fancy a picnic, or need some sausages to cook on your camp stove, you might go to the local superstore but you'll be unlucky if you happen to be in Windermere, Carnforth, Kendal, Shap, Kirkby Stephen, Penrith or Carlisle, where stores are omitted. Even stranger is the fact that the stores omitted belong to four companies, two of which are 'local' and two, insofar as I know, 'regional'. Wherever you shop, don't expect a huge range at the village shops in Warwick Bridge or Hallbankgate no matter how super they may be. Oddly, the one at Hallbankgate belongs to the Penrith Co-operative Society whose much larger store at Shap is omitted.

Don't worry about being late for a flight from Carlisle Airport, 'scheduled flights without customs facilities', you've missed the last one by a few years!

There is a second area diagram, similar to that on the cover with a little more information, all of which could have been included in the cover diagram making way for a bit more of the Yorkshire Dales. This time we do have Hadrian's Wall and those truncated National Cycle Routes, plus eight attractions of various sorts to which tourist might resort, but by what criteria were they chosen? It cannot be visitor numbers, Rheged had only been open six months or so in February 2001 and was predicting bankruptcy if the local council did not allow it to build more retail units to attract more visitors. Moreover, why the little blue cycle route road sign in the legend when only the route numbers appear in the diagram?

A gazetteer is also included in a panel in the bottom left hand corner of the map.

Finally, there is the question of the alphanumeric grid. The squares are in fact National Grid 10 km squares but there is no indication of this. Is it too much to ask that if an alphanumeric system has to be used that National Grid numbers are included? This is even more annoying when the *Road Map* manages to include an alphanumeric system with grid numbers, and degrees of latitude and longitude in the map border. (*The Yorkshire Dales & part of North Yorkshire, Touring Map*, published in April 2001 includes National Grid numbers).

The simple Bender fold, with the cover hinged to the top right, and one-sided printing makes for easy use by those experienced in handling maps, the large size may make it less so for the inexperienced, especially in a car!

The map shows great promise but fails to live up to one's expectations of both Ordnance Survey and one's first impressions on opening it. With a little more effort, it could be a very good map of its type, it may never be a cartographic masterpiece but it could be so much better.

Cumbria The Lake District Touring Map, Cumbria Tourist Board

This map must be seen as the *Touring map's* main competitor. It is identical in price, close in title, similar in scale and area mapped, excepting that areas outside Cumbria are mapped in outline only, a disadvantage of this map.

The cover is a picture of Brothers Water, looking down from Kirkstone Pass, with three cars, indicating the intended user but now giving a slightly dated appearance. The title, price and scale are shown, as is the Tourist Board's logo. Most of the back cover is taken up by an advertisement for the BNFL Sellafield Visitor Centre, another Tourist Board logo, a diagram indicating the area covered by the rectangular map but not the area mapped in detail (they are not the same) and a list of features.

At 1:158,400, the scale, like that used by Ordnance Survey, is unusual. However, there is no indication of the true scale. The scale bars seem to indicate the imperial scale is used rather than 1:160,000, indeed a misprint suggests a scale of 1:180,000 ('18' is used in place of '16' making 10 miles equal to about 18 not 16 km). Again the scale is probably dictated by the paper size as the St Bees to Stonesdale Moor width is just accommodated on the sheet.

So far as clarity goes the map is less clear than the *Touring map*, the roads being shown in only three colours, blue, red and yellow for the three road classifications. Primary routes are not differentiated from class A roads and two black lines represent 'other roads'. Circles of two sizes indicate villages and blocks of a pinkish purple tint show towns. Ordnance Survey uses blocks of a similar tint to indicate all settlements. Only the services on the M6 are shown and these are now out of date, the services at Tebay are only shown on the northbound carriageway.

The map is considerably more out of date than the Ordnance Survey's as the compilation information tells us:

This map has been compiled using satellite and conventional aerial photography with detailed information collected locally.

Produced digitally for Cumbria Tourist Board by ESR Cartography, Byfleet, Surrey, England
© Cumbria Tourist Board 1997

It shows far less woodland than Ordnance Survey but does show Areas of Outstanding Natural Beauty and Heritage Coast, even though an intrusive red screen indicates the former. The latter is shown in a green screen that is less intrusive, being shown only to the seaward side. Many landmarks are not shown; there are no wind generators, radio masts or rural telephone boxes, and most of the information included in the conventional signs panel of the Ordnance Survey map is missing. The Cumbria Cycle Way is shown though the National Cycle Trails are not but, in fairness, they may not have been open or even planned in 1997. Some Antiquities are shown as 'Archaeological Sites'.

Relief is represented by a four colour layering system with hill shading for which there is no key. The layers divide at approximately 200, 300 and 600 metres. The colour used for the second layer is also used for coastal sand and mud! Spot heights are shown in metres.

In terms of language, this map is excellent, the descriptions of all the symbols, except that for the Cumbrian Cycle Way, being translated into French, German, Dutch and Japanese.

There is at once more, and less, tourist information than on the Ordnance Survey's map, which shows forty-nine classes while the Tourist Board's shows fifty-one. If one includes the Ordnance Survey's five classes of antiquity, two types of rural telephone and four classes of services, the *Touring map* comes out on top in terms of numbers. However, the symbols are not directly comparable, there are no less than 22 symbols used by the Tourist Board that are

not used by the Ordnance Survey. There are of course some the other way, most notably public houses and motels, but these would be difficult for the Tourist Board to include as it charges such establishments to be members and could not therefore include non-member establishments, no matter what their utility to the tourist.

On the plus side, there are inset one-inch maps of the Keswick, Grasmere/Ambleside and Windermere/Bowness areas. There is also an untitled diagram showing air services from Manchester and Carlisle. Perhaps, Carlisle had flights in 1997. This plan also shows North Sea ferry routes and has its own inset for the Channel routes. Strangely, Irish Sea crossings are not shown.

On the reverse of the map there is a guide to tourist attractions under various classifications relating to the symbols used on the map. Many of the symbols on the map have a number attached to them without any explanation of what it is. When one turns the map over it is clear that they relate to a paragraph in the guide. Town centre plans for all the district's main towns are also given on the reverse.

Finally there is the grid of 6 cm squares with an alphanumeric referencing system but this seems to represent nothing more than a convenient division of the map area.

The fold is similar to the *Touring map* but with the cover hinged to the side making a long, narrow vertical opening map, which when coupled to two-sided printing is difficult to use.

Lake District, FlexiMap, Insight Map

A pretty little map, at an unusual scale and presented in an unusual format. The cover features Ashness Bridge, with the added interest of snow on the Skidaw Fells. The title, scale, *InsightMap* and *FlexiMap* logos are presented in bold panels. On the back this information is repeated with a sales blurb telling us that it has 'detailed, clear cartography', has a 'laminated finish' and is 'informative and easy to use'.

The lamination makes this map very unusual. There are six horizontal and two vertical folds giving fourteen panels and a gutter that forms the spine of the folded map. The map itself is printed in two halves, east and west on one sheet of paper with a vertical gutter of 6 mm between the two halves. This gutter is then cut away from the most northerly fold to the bottom giving a map in the shape of an inverted 'U' that can only be described as semi-dissected. The remaining section of the gutter forms the spine of the folded map. A great deal of thought has gone into this unusual presentation as the map is not only physically 'dissected' after printing but also before printing, leaving a small white margin around the cutaway gutter and a white strip between the north-western and north-eastern panels. This ensures that no map detail is lost if the registry of the die cutter is slightly out of true. The whole is then laminated resulting in a single sheet with an opaque gutter running down the centre of for six-sevenths of its length.

Once again, this map is on an unusual scale, 1:188,000 – about one inch to three miles, probably to accommodate the unusual format and the machines that produce it. Nonetheless, the map is clear and reminds me of the Esso Road maps of the 1950s and 1960s. The mapping is by Bartholomew Mapping Services and a copyright date of 2000 is given.

The road network is shown in four colours: motorways in blue with a double white centre line; primary routes in green and first-class (A) roads in magenta with a single yellow or white centre line for dual carriageways. Second-class (B) roads are shown by magenta cased yellow with the casing of double weight to represent dual carriageways; a fine magenta

line shows other roads. The mainly uncased lines give the map a much lighter appearance than the cased roads of the *1:250,000 Road Map* and it certainly bears out Chris Board's view⁷.

The reference panel is clear, if limited, but only includes nine classes of tourist information, none in the semi-standard style used by Ordnance Survey and Cumbria Tourist Board. Limited though it is, it serves its purpose and includes a key to the layering. This is subtle, light and in metres, it only loses its effect in the top layer above 900 metres, where the spot height triangle, height and name of the peak tend to obscure it on Scafell Pike, Scafell and Skidaw, though it does show on Helvellyn where the northern spur is clear. The spot heights are also in metres.

Settlements are shown by a small, uncoloured square or by a pinkish grey tint for larger towns, which also have a square to mark the town centre.

Tourist information is limited, but a number of important attractions, that might otherwise be missed, are included as 'Other interesting feature'. A numbered diamond highlights ten attractions, the numbers relating to a brief description of '10 sights you shouldn't miss' printed on the reverse.

The alphanumeric grid relates to the 10 km squares of the National Grid but no reference is made to it.

The reverse of the map includes the covers and town centre plans of Kendal, Keswick and Windermere, an interesting feature of the Kendal and Windermere plans is the inclusion of the *S-Bahn* symbol in their railway stations, indicative of the map's German origins. There is also a diagram showing the position of the map and major roads in northern England and southern Scotland.

Like the Tourist Board map there is a large amount of text information; a description of the Lake District and its climate, details of transport to the Lake District and local services, and the telephone numbers of Tourist Information Centres. There are also descriptions of the '10 sights you shouldn't miss'. A gazetteer is split between the face and back of the map.

The map is published by APA Publications GmbH & Co. Verlag KG, Singapore Branch along with an accompanying guide that is advertised on the back of the map.

This is a well thought out map but may be of limited use to the tourist who, on reaching the Lake District, will probably look for a more detailed map with which to explore. The unusual fold and lamination make this an expensive map for what it is when viewed from a tourist's point of view, but for me it's worth every penny for its novelty value and prettiness.

Leisure Map Lake District, Estate Publications

This map at a scale of 1:75,000 moves up to an entirely different sort of mapping, it should be compared to 1:50,000 or one-inch maps, but its title and price place it firmly in the tourist map bracket.

The cover is predominantly red with blue and white lettering, an outline map of Great Britain showing its location and, like the other maps reviewed, a photograph, this time of Grasmere, looking north over the lake and village to Seat Sandal on a spring day with a grey sky about to unleash one of the ferocious showers that are a feature of the Lake District's climate. On the back cover the title is repeated along with the publisher's address and an index diagram showing their other maps. There is no indication of scales but sixteen maps of various sizes cover the whole of England, Wales and part of Scotland. Additionally some

⁷ *ibid.*

have subsidiary maps of smaller areas, for example, sheet 15, *North Pennines & Lakes* covers an area from Dumfries in the north to Barrow-in-Furness in the south and from St Bees Head on the west coast to Tees Mouth in the east, subsidiary to this map is sheet 151, *Lake District*, the map under review.

On opening the map one is struck by its old fashioned appearance and muted colours, of which more later. Turning to the 'Legend' (it is so titled) there is very little general information, but we are told that the map is based on 'Ordnance Survey mapping' and 'Cartography prepared and published by ESTATE PUBLICATIONS with the editorial assistance of the Tourism Authorities & Lake District National Park'. The copyright date is given as '198 G', possibly 1986 or 1987. The tourist information is much more recent. A huge plus point is that everything, except the above, is translated into German, French, Dutch and Spanish.

The area covered is, as one might expect, much smaller than the previous maps, stretching from Row Brow, a tiny hamlet just outside Dearham, northwest of Cockermouth to Great Salkeld, northeast of Penrith and south to Millom in the west and Lupton on the A65, southeast of Kendal.

The road network is shown in three colours. A blue cased white line with a wide blue centre line for motorways, brown cased yellow for A roads and a narrower brown cased yellow line for B roads; other roads are represented by two brown lines and tracks by two pecked brown lines. Dual carriageways have a brown centre line. Two long distance recreational paths, The Allerdale Ramble and the Cumbria Way, are shown, as is the Sea-to-Sea Cycle Route (C2C Cycle Route, National Cycle Routes 7 and 71), these numbers are not given.

Two layers, with hill shading, divided at about 200 feet, represent relief but these are unexplained and add little to the map. Spot heights are given in metres but a spot, which at first sight might be assumed to fix the position of the peak, is in fact the full stop denoting the abbreviation of metre to 'm'. A few major peaks have their heights in feet appended. Craggs are also indicated, as are woods, all with a mixed woodland symbol.

Settlements are shown by rather old-fashioned brown squares and rectangles or, in the case of larger towns and closer building, a bluish grey tint.

Turning to the tourist information, this map includes no less than fifty-eight different symbols. In addition on the map there is much extra information in the form of notes, printed in red, appended to various features. We are told for instance that Scafell Pike is 'Highest Mountain in England' and that Wast Water is 'England's deepest lake 260'. I particularly liked the note attached to Peel Island in Coniston Water "Wildcat Island" from "Swallows & Amazons". Other information appended to towns and villages tells us where and when agricultural shows are held, plus much more. Two gazetteers, one of places of interest and the other of towns and villages are printed on the back.

This map uses a variation of the Bender fold with the cover applied directly to the back, making opening to view the southern half difficult enough at a desk let alone in a car, without the added complication of the gazetteers on the back.

Not a cartographic masterpiece, but certainly a worthwhile buy for the tourist looking for a map of the 'Lake District' and not venturing out in to the rest of Cumbria. For all its dated look and the poor representation of roads and relief, this and the InsightMap would be useful and complementary maps for a visitor.

A-Z Visitors' Map of Lake District, Geographers' A-Z Map Company Ltd

Like the Estate Publications map the scale of this map might be thought to make comparison with the others difficult. At one inch to one mile, this map is the largest in scale but still manages to cover a large area of ground, more in fact than the Ordnance Survey's or Bartholomew's one-inch maps of the Lake District did. Its title and price, £3.75, make it a direct competitor of the other maps reviewed.

The cover features three unidentified Lake District views, a diagram of the area covered, title, a list of the map's features and scale statement. The back cover has the publisher's details and lists of their other products.

On opening it one is confronted by a very red looking and quite off putting map. It has a cluttered look and it is hard to use, and in my opinion compares badly with the *Tourist map* in terms of the cartographic art. The area covered is from St Bees Head to Orton, Workington to Millom and Penrith to Milnthorpe.

Layers, contours and spot heights represent relief. There are six layers from high water to 2500 ft + at 500 ft intervals, with a seventh layer for the foreshore. The layer colours range from two yellows through two pinkish oranges to two shades of violet; the foreshore layer is light blue overlain by a darker blue screen for the sea. The contours, at 250 ft intervals, are red and delineate the layers. Spot heights, in black, are also in feet. Craggs are shown by the conventional symbol in black.

The scale is fully described with a ratio, description and scale bars in both imperial and metric systems. The scale bars include quarter miles and 250 metre divisions.

We are told in the margin that 'This map is based on the Ordnance Survey 1:50,000 and 1:10,560 [!] Maps...' we are also told this is 'Edition 21A (Part Revision) 2000'.

The road network is clearly represented in appropriate colours, blue, green, red, orange/brown and yellow; two black lines represent tracks. As one would expect at this scale, public footpaths, bridleways and other footpaths are shown but there is no mention of their right of way status. A grey screen represents towns and larger villages and groups of black squares show smaller places. Railways are represented conventionally, with clear station names even in places like Penrith where the station is in the town served.

The method chosen to represent woods is a blue tint, which when applied over the darker yellow layer, between 500 and 1000ft, looks green. Below that height, it is a bluish green and on the layers between 1000 and 2000ft it is grey. Luckily, there are no woods above 2500ft as the same blue screen is used to darken the violet of the 2000 to 2500ft layer for areas above 2500ft. A black screen represents parks but there is no explanation of what they are.

A heavy green line with green hatching over a broader yellow line indicates the National Park boundary. Where this boundary crosses a road, it is on top, except in the case of minor roads. These, in cased yellow, overlay the boundary and thus the clarity of road information is retained. National Trust property, of which there is a great deal in Cumbria, is shown by a red dotted line with hatching.

The names of many features are given in red using six or seven font/weight combinations. These names coupled with pinkish layers and National Trust boundaries give the map its unpleasant reddish look.

Forty-three classes of tourist information are represented by very small blue symbols that are almost impossible to see in some parts of the map. An interesting and novel feature is the indication of bus routes by appending their numbers beside the roads served. These seem to

date from 1999 but to keep the information up to date the map would have to be revised twice yearly.

There is the usual alphanumeric squaring at 5 km intervals based on the National Grid and, a big plus, the grid numbers are given in the margin!

Around the edges of the map there are plans of eight towns, all at a scale of 4 inches to 1 mile (1:15,840) and each has a scale bar. Appended to each is a short text describing the town and giving other information, such as market and early closing days, with details of significant annual events. Similar text boxes give information on nine other places without street plans. There is an index of towns, villages and places of interest, a list of the twenty-nine highest peaks and brief notes about mountain safety, the Country Code and the National Park.

The fold is a simple Bender style, opening vertically, but given that this map is shorter than the Tourist Board's and there is no information on the back to worry about, it is quite easy to use and similar to the *Landranger* in this respect.

At first sight this map is not very pleasing and one cannot help thinking it tries to do too much: the tourist information is lost and larger symbols may not help clarity. More colours and a lighter touch with the red might. However like the Estate Publications *Leisure Map Lake District* its virtues are only apparent on close examination, the cartography it is good, if spoiled by poor use of colours and, at £3.75, it represents excellent value for the tourist if not for the more critical map user.

In conclusion, it would be fair to say that each of the maps is good in its own way. On balance, the Ordnance Survey *Touring map* is probably the best of a less than perfect bunch; some slight adjustments would make it an excellent map of its type.

Firstly, heights should be fully metric and the layering improved. If Bartholomew could do it well in the 1890s, surely Ordnance Survey could today. Then some thought could be given to the way the map is enlarged, particularly the representation of roads which could be shown by lines of a lighter weight. Even allowing for the inevitable distortion of a map, do motorways need to be almost ½ km wide? Settlements might also be more finely drawn. Contours and grid numbers are necessary and surely, National Cycle Routes should be mapped beyond the boundary of the county named in the title.

Once the base cartography has been improved, attention might then be turned to the tourist information. In a non-standard map, there is no reason not to have a non-standard set of symbols. For example, there are never likely to be any vineyards in Cumbria and, as there is only one airport, only one accurate symbol is needed.

Each of the maps has different tourist information but use a near standard set of symbols. Unfortunately the same symbol is used for slightly different things on different maps and in some cases different symbols are used for the same feature. Perhaps the Tourist Boards (national and regional) could come together with the Highways Agency (who prescribe the symbols to be used on brown road signs) and Ordnance Survey to devise a National Set of Tourist Signs; this set could be then made freely available to all map and sign makers who should be encouraged to use it.

Finally, in view of the age of the Cumbria Tourist Board's map, wouldn't it be a good idea if Ordnance Survey got together with them, the National Park Authority, Cumbria County Council and the six District Councils to produce a new authoritative touring map. All these organisations are in some way *governmental*, all draw funding from the public purse and all have a stake in a better tourist map. Now that Ordnance Survey have gone part of the

way by producing a tolerable map and there is plenty of Foot and Mouth regeneration and recovery money about for Tourism marketing, there might never be a better opportunity to make a definitive touring map for the twenty-first century.

So which map would I buy? The Ordnance Survey *Touring map* of course! It might not be perfect but at £3.95 it's pretty good value and I am biased in favour of anything from Southampton.

Postscript.

I had always known that Goldeneye produces a map that ought to be included in this review; unfortunately, I could not find one in Cumbria and only obtained a copy on a recent visit to Stanford's. Titled *Lake District Map & Guidebook in one* and at the half-inch scale it competes directly with those reviewed. I have not had time to look at it closely but a quick glance indicates that it has a traditional look, very similar to the old Bartholomew's maps at the same scale. It looks attractive and shows some of the woods, near my home, missing from the *Tourist map*.

I also bought Ordnance Survey's *Yorkshire Dales & part of North Yorkshire, Touring Map* at the same time and found that it shows grid numbers in the margin. Strangely though, the mapping of those parts of Cumbria and North Yorkshire common to both *Tourist maps* is not the same, as one would expect in a regular map series. The tourist information is applied differently, place names are re-positioned and in one case a road, all be it a minor one, is omitted altogether, though that, as they say, is another story.

Book reviews

Ordnance Survey Letters Donegal: Letters containing Information relative to the Antiquities of Donegal collected during the Progress of the Ordnance Survey in 1835 edited with an introduction by Michael Herity, Dublin, Four Masters Press, 2000. ISBN 1-903538-00-7, paperback £25, xxiv + 148 pp.

Ordnance Survey Letters Meath: ... 1836, 2001. ISBN 1-903538-03-3, hardback £45, xxx + 146 pp. Other details as for Donegal.

Ordnance Survey Letters Dublin: ... 1837, 2001. ISBN 1-903538-05-X, hardback £35, xxiv + 94 pp. Other details as for Donegal.

As part of the first Ordnance Survey of Ireland, placenames and cognate information were recorded in specially printed form books in which the staff responsible for the chain survey listed variant spellings of each name, assigned each spelling to its source, and entered descriptive remarks about the feature so designated. This essentially English approach to toponymy was later extended in two ways. Pre-nineteenth century spellings were collected in the libraries of Dublin and added to the name books by members of the Survey's specially formed 'topographical' department, while other scholars were employed as fieldworkers to study each name in the context of the local landscape and to hear it spoken by local residents. The object of the exercise was to ensure that the names were in some sense authentic, as well as being in harmony with current usage, and to this end the field researchers made two

additional entries under each heading: one was the most probable Gaelic version of any name with an Irish origin, the other the spelling recommended for publication on the maps. The same people also took note of antiquities suitable for mapping, together with a range of other facts relevant to the non-cartographic memoirs currently being planned by Captain Thomas Larcom, superintendent of the Survey's Dublin office. This more general 'memoir-style' information was recorded in letters sent to Larcom by the topographical field workers.

The letters in question, like the name books, have often been the subject of misunderstanding. The term 'Ordnance Survey letters' is itself not altogether accurate, because the Irish Ordnance Survey has also preserved a great mass of other correspondence on technical and administrative subjects unrelated to toponymy. Another common error is to describe both name books and letters without qualification as "O'Donovan's". Admittedly John O'Donovan was the most energetic, erudite, talented and interesting of the letter-writers. But he was not the head of his department (that distinction belonged to the archaeologist, George Petrie), he contributed only a small proportion of the entries in the name books, he wrote none of the descriptive remarks, and as a relatively junior employee he had no ultimate personal responsibility for the names published on the Ordnance map. Nor was he Larcom's only topographic correspondent: in the volumes under review, for instance, a quarter of the letters were written by other people. The worst mistake of all, however, is to suggest that in mapping Irish placenames either O'Donovan or his superiors perpetrated the 'introduction' of phonetic orthography and the 'intrusion' of letters from outside the Irish alphabet. In fact the Survey's behaviour in this respect was deeply rooted in Anglo-Irish history, cartographic and otherwise. In adopting anglicised placenames it was deferring to established custom, which is what surveyors are expected to do.

While O'Donovan's role may sometimes have been misconceived, his fame and popularity remain thoroughly well deserved. As a letter-writer he is often brilliant: not only informative about placenames, antiquities, genealogy, and historical geography (including historical cartography) but also a rich source of hints about Irish social and economic problems, cultural and religious preoccupations, departmental and scholarly relationships, the texture of everyday life in town and countryside, and the hazards of travel in the 1830s. He has a distinctive outlook on life, an individual sense of humour, an engagingly personal style of writing and, more seriously, a deep commitment to his task that makes the study of the early letters an uplifting as well as an entertaining experience. Unfortunately O'Donovan worked too hard for his own well-being and by the late 1830s he had lost a good deal of his initial ebullience.

The above remarks are partly prompted by a recent re-reading of John Paddy Browne's article, 'The fifth master', in *Sheetlines* 28 (1990), pp 2-4. A more particular occasion for comment is that Browne's plea for the publication of the 'Ordnance Survey letters' has finally been heard in Dublin. The whole series is now being edited as a sequence of twenty-nine county volumes by a distinguished archaeologist, Michael Herity, and handsomely printed by the Four Masters Press, each volume with illustrations, a bibliography, an introduction adapted to the needs of its county, and an index. Three volumes have appeared so far – four if we count the equally attractive volume of Wicklow letters recently published as an independent venture by two local history societies. For readers with time or funds for only one example I recommend Donegal, which includes Dr Herity's interesting bibliographical note on the whole collection and a preface by the eminent Irish playwright Brian Friel. It also contains one of my own favourites among O'Donovan's personal touches,

which was deliberately to adopt Elizabethan phraseology and spelling (minus quotation marks) for his own criticism of the ‘utterlie’ false geography purveyed by Gerard Mercator and John Norden. This was no mere frivolity, but a gentle hint to future ‘post-modern’ cartographic historians that early maps were not always accepted as accurate by contemporary readers.

J H Andrews

Kerry musings

David Archer

Bird watchers call them LBJs, Little Brown Jobs. Meaning small brown birds they cannot immediately identify. I call them Little Marbly Jobs. Meaning anonymous small black and white maps, usually in a variety of marbled (and occasionally plain) covers with the agent’s details on the front, which I find hard to identify, immediately or otherwise.

I have two large drawers of these, over six hundred maps, and I just add to them without really trying to move any on. Why? Because I shy away from the work involved in deciding what they are. Ninety-eight per cent are dissected on cloth with the margins trimmed to the framed borders, so one has to go on internal evidence in order to identify them. And I hate it, because the three main series involved all look similar at a glance.¹ I am only consoled by having had Richard Oliver look at some and state that he could not be positive of what they were without comparison with another map.

The culprits were mapsellers and agents for the Ordnance Survey, who trimmed and dissected the maps and usually put them into nice boxes and slipcases of various sorts. Though why they had to get rid of the margins I cannot figure out. I do have some very nice ones *with* margins and they are lovely. Yes, one often finds a key stuck to the back of the map, which should help, but it need not be for the map on the other side. Sometimes a more recent key was used for an older map and vice versa (no Trading Standards Officers in those days).

The main map series found in marbled covers are one-inch outline editions of England and Wales with sheet lines laid out on 360 sheets. Even with margins present, people find the 360 sheet period the most difficult to grasp. First there was the Old Series which stands alone. Then we had the 360 sheet layout used for the New Series, followed by the Revised New Series and the Third Edition small sheet series.² The one-inch map then changed to a larger sheet size for the 152 sheets of the Third Edition, Large Sheet Series. There are plenty of things to muddy the picture, for example Old Series quarter sheets, different versions of the New Series (advance editions, hachured with contours...), Scottish maps, scales other than one-inch... all appear in marbled covers.

¹ Just like Bartholomew’s maps, which have very similar blue covers for each series.

² Followed by the forgotten *Fourth Edition* of which, only seven sheets were published.

Whenever I am forced to give an opinion on a marbly job I have to get out my notes. These are based on an excellent article in an early issue of *Sheetlines*³ and help to some extent. Thus I can tell a New Series sheet from a Revised New Series if it has P.O. for Post Office, rather than P. And I know that a map is not a New Series if a church symbol has a black square or circular blob under the cross. Even better is when I have two versions of the same sheet to compare, and three different versions are usually a clincher.

I keep telling myself that I must try to make a diagnostic test for marbly jobs in order to identify them; a flow diagram with YES/NO at each stage. Does it have windmills (YES/NO), does it have a symbol for railways stations (YES/NO)? The major drawback with diagnostic testing is the absence of a single feature that appears on every sheet yet is different from one series to another. Contours are about the most common feature and help identify the New Series as they are shown by dots with contour heights, whereas later series have dots and dashes plus contour heights. But, in the absence of colour, deciding between the Revised New Series and the early Third Edition small sheet series, is a killer without margins.⁴ With margins, I can identify any Third Edition sheet at thirty paces as they all say *Third Edition* in the top left corner. The ideal solution would be to visit a library, get out the most commonly found series and compare every sheet, noting a detail specific to each series for each sheet. A sort of cartographic fingerprint. This would be a winner, and in book form would sell well to mapsellers.

Why were the margins trimmed on these maps? I cannot see any point in it. Yet they all did it, most of the time. It would certainly have involved more work to trim the margins and paste only the key on the reverse, but both marbly jobs and many maps in agents' covers are usually without margins. Maybe at first they wanted to avoid drawing attention to how out of date some of the New Series maps were when issued as such, and this set the trend for the following series. Certainly, the Revised New Series and Third Edition small sheet series were OK for currency when issued. As they are, the maps are not even suitable for butting together, since the border frames get in the way.

Is there any significance in the different marbling designs? The main ones are those produced by Edward Stanford; either a white base with blue marbling or a dark maroon ledger style marbling. Both usually have the agent's label on the front cover. Some maps have a very nice capital R in pencil to the right of the sheet number. Using the contour test, I once thought that this stood for Revised New Series and was to help the agent, who could not easily identify the new maps either. But now I am not sure.⁵ At last, help is at hand. I have decided that the way forward is to invest in a reference set of the one-inch facsimiles, based on the 360 sheet layout, being published by Alan Godfrey. All have full margins. This will mean that I always have at least one identified sheet available for comparison. And with a bit of luck, the little marbly job in hand will be the same as the reprint. Too easy.

³ Richard Oliver, What's what with the New Series, *Sheetlines* 5 (1982), 3-8. This is probably the most useful article ever to have appeared in *Sheetlines*, and would merit revision and republishing with better illustrations.

⁴ See *Sheetlines* 5 (1982), 4.

⁵ Bill Bignell has noted that hand-coloured versions only appear in ledger style marbled covers, and Richard Oliver that Philip used red covers for coloured and black for uncoloured versions.

Letters

Another Guidepost

Rob Wheeler understated the interest and importance of the pre-turnpike guide stoops of Derbyshire and Yorkshire, but Tony Meatyard understates their appearance on current maps.¹

W B Crump drew attention to these stones in 1949, and to the history behind their erection, in his classic account of the development of a local and regional highway network.² More recently Professor David Hey has provided a more wide-ranging account.³ They followed an Act of Parliament of 1697 ordering guide posts at cross-highways. According to Hey the Lancashire Justices implemented the Act immediately and Celia Fiennes reported seeing guide posts on the Garstang to Lancaster road the following year. The West Riding Justices of the Peace reportedly issued a corresponding Order in 1700 for “Stoops to be sett up in Crosse highways” inscribed with “the name of the next Market Town to which each of the joining highways leede”, although the surviving West Riding stones date from further orders issued in 1733 and 1738. The Derbyshire Justices did not implement the Act until 1709, but then seem to have done so vigorously, and many of the Derbyshire stones carry the date 1709. It seems that guide posts in all other counties were made of wood, and so have not survived. Derbyshire chose to use the more durable stone posts particularly on open moors, and was later followed by the West Riding. While the general form of the stones in the two counties is similar, many of the Yorkshire ones give mileages as well as destinations.

One at least of the West Riding stoops is marked on a current 1:25,000 map. That at SE114506 is marked as ‘MS’ on Explorer sheet 27, and still usefully serves its original purpose a quarter of a millennium after it was placed there.⁴ The presence of distances on this stone seems to have triggered it to be recorded thus, rather than as a ‘GP’. Other instances most probably also exist.

John L Cruickshank

Boring maps

Reading the latest offerings on this subject brought to mind one of the maps I was given to revise whilst working as a young Ordnance Surveyor on the overhaul of the 1:2500 county Series mapping to produce the first (A) editions of National Grid maps of North Yorkshire in about 1967/68.

Whilst updating the mapping along the coast between Scarborough and Whitby I was responsible for checking and completing the survey of map number OV 0000, (the only ‘OV’ plan in the National Grid). To the best of my recollection the only features on the field sheet were the name ‘North Sea’ on the eastern margin, 30 metres of low water tideline crossing

¹ *Sheetlines* 58, 27 and 61, 39.

² W B Crump, *Huddersfield Highways Down the Ages*, Huddersfield, Tolson Memorial Museum, 1949, and subsequent reprints, pp 46-47.

³ David Hey, *Packmen, Carriers and Packhorse Roads*, Leicester University Press, 1980, pp 35-47.

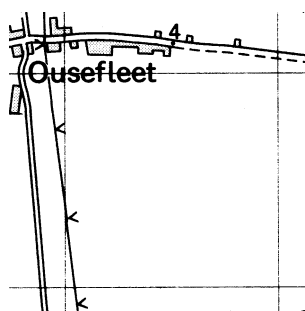
⁴ See *Sheetlines* 50, 6.

the southwest corner, and the annotation ‘boulders’ on the foreshore between the tideline and the SW corner of the map. The remaining 99.9% of the field sheet was blank.

Access to the foreshore was down a precipitous boulder clay cliff which I judged it, even in my adventurous days of youth, to be prudent not to attempt. It is, accordingly, the only map that I have revised in my 37+ years as an OS surveyor without ever setting foot within its limits, having inspected, checked and classified the foreshore detail from the relative safety of the cliff top.

I don’t imagine that this map was ever published as a separate sheet, or even as an extension to either NZ9900 or TA0099, but I am prepared to be contradicted by the superior knowledge of one of our learned colleagues.

David Andrews



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As *Sheetlines 61* went to press, the subject of empty grid squares was raised on John Peel’s Saturday morning Radio 4 programme, *Home Truths*. Jack Kirby alerted the programme to the Society’s ongoing discussion, and the BBC contacted OS. The BBC website, <http://www.bbc.co.uk/radio4/hometruths/>, quotes the response: “There are no blank squares on any of our (current) 204 *Landranger* maps ... but our cartographers believe that the person nominating the square with the tiny nick of electricity line has probably found the emptiest”.

The website goes on to congratulate David Machin on nominating square SE8322. Our reproduction of ‘the duller place in Britain’ is taken from a copy of *Landranger* Second Series sheet 106 (A/*/*) in Rodney Leary’s collection. – *CJH*.

Lists of A and B roads

The ‘Ministry of Transport Road Map’ series, published by OS in the 1920s and early 1930s, was intended as a source of reference on the then recently-introduced numbering system for A and B roads. Early issues carried a statement on the inside cover to the effect that ‘Lists giving the numbers of all Class I and Class II roads, arranged in serial order, are also published, and may be purchased directly from H.M. Stationery Office and from all Agents for the sale of Ordnance Survey Maps’. This statement was omitted from maps issued after about 1926, presumably indicating that the lists were no longer available.

Enquiries to OS, and to the Highways Agency, seeking details of the lists, drew a blank. The former indicated that, because they were not maps, details had not been retained, and the latter simply failed to reply.

Do any members have, or have access to, copies of these lists?

Graham Bird

Imaginary maps

I am writing to congratulate Alan Young on his wonderful world of Seventh Series maps. The article was quite inspiring and it would be interesting to see more extracts. So inspiring indeed that a fellow member and I attempted to follow Alan's example by creating our own islands, again in the style of the Seventh Series. Whilst we were pleased with the results they did not match Alan's superior work although we had the excuse of not having thirty-five years practice!

We did find it difficult to produce accurate lettering with pens. Conventional Staedtler and Edding pens, even at 0.1 mm seem to lose their nib shape and sharpness with use. For the next project I will try Rotring. Additionally it is difficult, as Alan implied, to find something other than coloured pencil to replicate the colour of contours. However, probably the most difficult task is trying to fit in all the lettering around other map detail without thinking ahead (which is difficult with an imaginary map) and leaving gaps in road and other detail when it is first drawn. Perhaps the society should launch a competition for the best imaginary Ordnance Survey map, with different categories for different series or size of maps. Anyway Kirrin Island, a.k.a. Enid Blyton's Famous Five, and Ynys Hen, the Old Island off the Welsh coast near Barmouth, have been added to the Queen's provinces and accurately recorded by the Ordnance Survey.

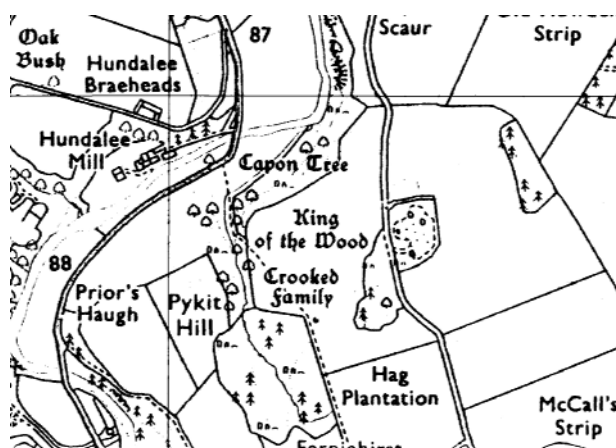
Lastly, I was puzzled how Alan would replicate a six thousand-foot mountain on a Seventh Series Ordnance Survey map. Surely at our latitudes a hill of that size would carry a permanent snowcap. To my knowledge such features have never been mapped on the domestic small-scale maps and I would be interested to know how they are portrayed.¹

Mike Taylor

Two trees in a one-kilometre square

The illustration shows square NT 6518, south of Jedburgh, on Outdoor Leisure map 16, *The Cheviot Hills*, 1995 (A) edition. Both King of the Wood and Capon Tree were there in June 2000. King of the Wood is a huge, tall oak in woodland above the road.

The Capon Tree, also an oak but split and propped up, on the west side of the road has a notice board reading 'Last survivor of Jed Forest and perhaps 500+ years old'.



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Barbara Jones

¹ Given the effect of the Gulf Stream, and that in the Alps the permanent snow line is generally above 7500', the Editor wonders how far north Alan's coastal resort could be without its mountain having a summer snowcap? – CJH

The 'parallel roads'

A curious aspect of the treatment of the parallel roads¹ on the one-inch Scottish Third Edition sheets is the incomplete way in which the ancillary data to the table of levels was transferred from the legend to the face of the map. On sheets 62 and 63 there is a footnote to the table:

LEVELS OF PARALLEL ROADS

GLEN GLOY					GLEN ROY					GLEN SPEAN				
	<i>Highest</i>	<i>Lowest</i>	<i>Average</i>	Col		<i>Highest</i>	<i>Lowest</i>	<i>Average</i>	Col		<i>Highest</i>	<i>Lowest</i>	<i>Average</i>	Col
1	1173	1156	1165	1172	1	1155	1144	1148	1151					
					2	1077	1062	1067	1075					
					3	862	850	855	848	1	862	850	855	848

Third Edition

ICE BARRIERS.....A to B, C to D, E to F.
SKETCHES.....1.2.3.4.5.6.

A pecked line, four miles long, linking points identified as E and F duly appears on sheet 62 to show the position of the Glen Spean barrier. However, although the Glen Gloy and Glen Roy parallel roads are marked on sheet 63 with a plentiful supply of spot heights, the letters A, B, C and D, and the pecked lines are all missing.²

For the sketch points a type size larger than that used for road mileages was chosen and to avoid any ambiguity the lettering 'N^o' was added. N^o 1 is in Glen Roy and numbers 3, 4, and 5 are along Glen Spean. N^o 6 makes a surprise appearance near the north-western end of Loch Laggan. Search parties have failed to locate N^o 2.

Guy Messenger³ is cautious on the subject: 'it is not certain whether every copy of these sheets was marked in this way'. I am subject to correction, but it seems more likely that all sheets were equally defective. There were two issues, in 1909 and c1915, differentiated only(?) by cover styles and price statements. My copies are of the later version when an opportunity to make corrections or to end speculation as to the significance of the 'sketches' had been neglected.

This apparently half-hearted venture was not repeated on half-inch sheet 18 of the period and had disappeared without trace from the one-inch Popular Edition of 1928.

Peter Warburton

Proper Charlies

For twenty-one years I have intermittently tried to find a short name to describe "a member of the Charles Close Society". My usual fallback is typically "he's a member of the Close Society". Hardly snappy.

In September, Steve Simpson wrote to me "...until I thought about the Kent trip with the Charlies (the Shap Wells name for map folk)...".

Once seen, never forgotten.

David Archer (Charlie number 18)

¹ Sheetlines 61, 34.

² OS ambitions in showing the ice barriers were evidently limited to two of the four Glen Roy / Glen Gloy roads.

³ Guy Messenger, *A Guide to the Ordnance Survey One-inch Map of Scotland, Third Edition in Colour*, Charles Close Society, 1991.

New maps

Jon Risby

This list covers all small scale maps published between 22 July 2001 and 20 November 2001. They are listed by series, and in sheet number order. The columns are as follows: Sheet No. / Title / Edition / Copyright date / Full revision date / Latest revision date / Date of publication. There is also a list of those maps due for publication by OS up to 31 January 2002 (in order of their proposed publication).

After the list of OS maps is a resumé of maps published by Alan Godfrey between August and November 2001.

Landranger

8	Stornoway & North Lewis	C	2001	2000	2001	22/08/01
13	West Lewis & North Harris	C	2001	2000	2001	22/08/01
14	Tarbert & Loch Seaforth	C	2001	2000	2001	22/08/01
18	Sound of Harris, North Uist, Taransay & St Kilda	B	2001	2000	2001	22/08/01
22	Benbecula & South Uist	C	2001	2000	2001	22/08/01
47	Tobermory & North Mull	C	2001	2000	2001	05/09/01
48	Iona & West Mull, Ulva	C	2001	2000	2001	05/09/01
59	St Andrews, Kirkcaldy & Glenrothes	C	2001	2000	2001	15/08/01
76	Girvan, Ballantrae & Barrhill	D	2001	2000	2001	15/08/01
114	Anglesey	B2	2001	1997	2001	05/09/01
128	Derby & Burton upon Trent	D	2001	2000	2001	15/08/01
166	Luton & Hertford, Hitchin & St Albans	C1	2001	1998/9	2001	15/08/01

Explorer – new publications

347	Loch Lomond South, Dumbarton & Helensburgh, Drymen & Cove	A	2001	2001	-	03/10/01
355	Jura & Scarba	A	2001	2001	-	24/10/01
361	Isle of Arran	A	2001	2001	-	25/07/01
364	Loch Lomond North, Tyndrum, Crianlarich & Arrochar	A	2001	2001	-	03/10/01
365	The Trossachs, Callander, Aberfoyle & Lochearnhead, Balquhidder & Strathyre	A	2001	2001	-	23/08/01
366	Stirling & Ochil Hills West, Alloa & Dunblane	A	2001	2001	-	03/10/01
367	Dumfermline Kirkcaldy & Glenrothes South, Methil & Culross	A	2001	2001	-	14/11/01
368	Crieff, Comrie & Glen Artney, Strathearn & Auchterarder	A	2001	2001	-	14/11/01
371	St Andrews & East Fife, Cupar, Anstruther & Crail	A	2001	2001	-	10/10/01
380	Dundee & Sidlaw Hills	A	2001	2001	-	01/08/01
381	Blairgowrie Kirriemuir & Glamis, Strathmore West	A	2001	2001	-	21/11/01
382	Arbroath, Montrose & Carnoustie, Laurencekirk	A	2001	2001	-	31/10/01
386	Pitlochry & Loch Tummel, Aberfeldy, Kinloch Rannoch & Schiehallion	A	2001	2001	-	03/10/01

Explorer – new editions

107	St Austell & Liskeard, Fowey, Looe & Lostwithiel	A1	2001	1997	2001 ¹	16/08/01
115	Exmouth Sidmouth, Honiton	A1	1997	1997	2001 ¹	06/09/01

Routeplanner maps

Great Britain 2002	2002	2001	9/2001	1/2002	04/10/01
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CD-ROM

OS Interactive Atlas of Great Britain	Fifth Edition	05/11/01
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OS Ireland/OS Northern Ireland

	Dublin Street Map	10/01
2	Holiday Map West	10/01
4	Holiday Map South	10/01

Discoverer maps

84	Cork, Kerry	10/01
88	Cork	10/01

Forthcoming Maps

The following maps have been announced for publication up to 31 January 2002.

Landranger

There have been no new editions of *Landrangers* since mid September 2001, and none are listed for publication. The explanation from OS is that the *Landranger* is under review, and is expected to reappear in March 2002 with a new cover, and possibly a new format.

Explorer – new publications

395	Glen Esk & Glen Tanar	A	05/12/01
357	Kintyre North	A	12/12/01
379	Dunkeld, Aberfeldy & Glen Almond	A	12/12/01
387	Glen Shee & Braemar	A	12/12/01
402	Strathspey	A	12/12/01
393	Ben Alder, Loch Ericht & Loch Laggan	A	19/12/01
388	Lochnagar, Glen Muick & Glen Cova	A	02/01/02
358	Lochgilphead & Knapdale North	A	11/01/02
394	Atholl	A	11/01/02
385	Rannoch Moor & Ben Alder	A	16/01/02
378	Ben Lawers & Glen Lyon	A	30/01/02

Touring maps

The Cotswolds	A	06/02/02
North York Moors	A	06/02/02

¹ Revised for selected change

Alan Godfrey Maps

Details of Alan Godfrey's reprints of old OS maps are available from Alan Godfrey Maps, Prospect Business Park, Leadgate, Consett, DH8 7PW, tel. 01207 583388, fax 01207 583399, or from their website at <http://www.alangodfreymaps.co.uk/>.

The columns are as follows: County / Sheet number / Title / Date of map / Month of issue.

Co. Durham	12.09	Annfield Plain	1895	8/01
Co. Durham	34.01	Crook (East)	1896	10/01
Devon	123.07	Devonport (North)	1893	8/01
Devon	123.11	Devonport (South) & Stonehouse	1893	8/01
Glasgow & Lanarkshire	10.03	Rutherglen West & Polmadie	1910	8/01
Glasgow & Lanarkshire	10.04	Rutherglen East	1910	8/01
Hampshire	18.08	Basingstoke	1894	9/01
Hampshire	70.11	Ringwood	1896	9/01
Kent	9.01	Crayford	1907	10/01
Lanarkshire	18.03	Wishaw	1896	10/01
Lancashire	95.02	Moses Gate	1908	7/01
Lancashire	97.09	Oldham (SW)	1916	7/01
Lancashire	94.09	Hindley	1907	9/01
Lancashire	97.14	Bardsley	1906	9/01
Lancashire	104.05	Salford (West)	1916	9/01
Lancashire	99.08	Kirkby	1907	11/01
Lancashire	93.12	Ince in Makerfield	1927	10/01
Lincolnshire	134.14	Spalding	1903	8/01
London	86	Hammersmith & Fulham	1894	8/01
London	52	Bethnal Green & Bow	1870	11/01
London	27	Hampstead	1915	10/01
Middlesex	14.03	Uxbridge	1895	7/01
Northamptonshire	17.03	Corby	1899	9/01
Northamptonshire	26.15	Thrapston	1899	11/01
Shropshire	43.07	Dawley Magna & Stirchley	1901	9/01
Shropshire	43.15	Madeley (South) & Blists Hill	1901	9/01
Staffordshire	69.09	Perry Bar	1902	11/01
Suffolk	6.16	Brandon	1903	7/01
Surrey	41.04	Horley	1912	10/01
Warwickshire	8.14	Gravelly Hill	1902	10/01
Yorkshire	281.12	Stocksbridge	1903	8/01
Yorkshire	218.07	Leeds (Osmondthorpe & Neville Hill)	1906	9/01
Yorkshire	217.04	Upper Armley	1906	11/01
Yorkshire	217.03	Bramley	1906	10/01

England and Wales one-inch

121	Wrexham & Vale of Llangollen	1904	9/01
164	SW Montgomeryshire	1908	10/01
173	Isle of Ely	1907	9/01
174	Breckland	1907	10/01
178	Mid Cardiganshire	1909	9/01
192/209	St Davids Peninsula	1909	10/01
210	North Pembrokeshire	1909	10/01
351	Penzance & St Ives Bay	1888	9/01