This edition of *Sheetlines* was published in 1995 and the articles may have been superseded by later research. Please check the index at [http://www.charlesclosesociety.org/sheetlinesindex](http://www.charlesclosesociety.org/sheetlinesindex) for the most up-to-date references.

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THE CHARLES CLOSE SOCIETY
for the Study of Ordnance Survey Maps


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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Meetings

Notice of the Annual General Meeting

Notice is given that the Annual General Meeting will be held on 18th May, 1996, at Birkbeck College, London, commencing at Noon.

Professor D.W. Rhind, Director General, Ordnance Survey, will address the meeting at 1100 on History and the Ordnance Survey.

The annual Map Market will be held in the afternoon, following lunch. Preliminary details are given in Marginalia in this issue of Sheetlines.

Oxford

The spring Oxford Seminar in Cartography will be held on Thursday, 1st February, 1996.

GIS in Thames Water Utilities Ltd.: A Pipe Dream?
by David Gatfield, Senior Project Engineer, and Michael Chesterman, Project Engineer, Thames Water Utilities Limited,

Commencing at 5 p.m., the meeting will be held in the Schola Astronomiæ et Rhetoricæ, Schools Quadrangle, Bodleian Library, Oxford.

Branston

The next meeting of the Midlands Group will be on Wednesday, 7th February, 1996, at 7.30 p.m.

Members attending are asked to bring their own maps and Ordnance Survey ephemera for discussion.

Details of the meeting venue have been given in previous issues of Sheetlines.

Further details can be obtained from Lez Watson, telephone: 01283 541303

Bath

The Spring Meeting will be held in Bath on Saturday, 16th March, 1996, at the Manvers Street Baptist Church. The meeting is titled Work in Progress. Two speakers are being arranged.

Manvers Street Baptist Church is 200 metres from the Railway Station, a little less from the coach station. The Meeting Room will be clearly signed from the outside of the building. Because of the cost of car parking in Bath, members coming by car are advised to use the Newbridge Park and Ride car park, or the Saturdays only University Park and Ride car park.

Further details of the meeting, map showing car parks, city centre Park and Ride bus stops and information about hotels or Bed and Breakfast can be obtained from Lionel Hooper.
Editorial

It is surprising how a number of small snippets and articles come together at the same time. This particular issue of *Sheetlines* contains a number of references to the use of Ordnance Survey maps in all media, as well as examples of maps reproduced in other publications.

What springs to (my) mind is the question of the exact meanings of the variously expressed acknowledgements of the source, and what was the relationship between the Ordnance Survey and the early commercial map makers/producers who used OS data; perhaps particularly between the OS and Bartholomew.

In Seymour’s *History of the Ordnance Survey* a number of references are made to the apparently early muddled and inconsistent application of the copyright law to the inclusion of Ordnance Survey information into the private map printers publications, and to later prosecutions. (Perhaps not a lot has changed in the latter respect, as the OS has recently successfully brought actions against two map companies for infringement of copyright, and a video company for using an OS map as part of the video wrapper art work. Perhaps these were spurred as much by loss of revenue as principle!). That the Controller of Her Majesty’s Stationery Office became the personage who gave permission for OS information to be used is well known, but the inclusion of the Ordnance Survey Director General’s name was thought to be necessary to enable copyright infringement actions to be taken. Undoubtedly, there is much more history in this subject than has been written and perhaps a more authoritative account needs to be produced.

Finally, I make no apology for including an extract from the Sunday Telegraph Magazine under its original title *Rural Rides*, as to me it encapsulates the feelings that many members experience when studying Ordnance Survey maps. That it has been written by a person with an apparent passing specific interest in the map, not a cartographer nor a collector, makes it all the more poignant.

On behalf of the two committees of the Charles Close Society, may I wish all members

Compliments of the Season,
A Happy New Year,
and Successful Map Hunting and Study in 1996.
Many will remember Richard Arden-Close, who died on Armistice Day, as a tall, distinguished gentleman who attended most of the Annual General Meetings until recently, and who bore a remarkable resemblance to his father, Charles Close (later Sir Charles Arden-Close). When Richard joined this Society, on 29 December 1981, he listed under the ‘Ordnance Survey Interests’ section of his application form the single word: ‘Father’.

I think it is no exaggeration to say that Richard idolised his father, whom he regarded as a brilliant polymath; he would often say that his only claim to fame was that he was the eldest son ‘of a most distinguished Sapper and great geographer’. It was therefore a constant source of joy to him that a Society should have been named after his illustrious parent. Charles Close was forty-nine when Richard was born; yet the onset of later middle age was no obstacle to rowdy games of football between father and sons. Holidays would be spent in Jersey, where many happy hours were spent in pursuit of butterflies and moths. More significantly, a love of the past, and of archaeology, was instilled into the young Richard from an early age, no doubt fostered by the numerous meetings with the Ordnance Survey’s Archaeology Officer, O.G.S. Crawford, who was a frequent visitor to the Close home in Winchester.

From Twyford School, Richard went on to Winchester College, where he distinguished himself in classics. But his ambition to continue his studies at Oxford was thwarted by his father’s insistence on his following the family tradition of taking up an army career. He was sent to the Royal Military Academy at Sandhurst; I can hear his voice now: ‘My dear Yolande (he invariably pronounced my name with a French accent), Sandhurst was such a CULTURAL DESERT (he frequently employed upper case in the spoken, as well as written, word), and ‘life there after Winchester was rather DULL, e.g. DRILL, P.T., endless drill on the SQUARE ... and EQUITATION’. Nevertheless, he applied himself to his studies and passed out high into the King's Shropshire Light Infantry (the 53rd and 85th of Foot; coincidentally, William Roy, the ‘founder’ of the Ordnance Survey, was commissioned into the 53rd Foot in 1756).

There followed a series of regimental appointments in this country and abroad, including that of Chief of Staff to a General in Bermuda. Of the war years, Richard was to recollect that his most interesting, and perhaps most distinguished period, was the time surrounding the D-Day invasions. He had the command of 120 soldiers from his regiment in the 3rd British Division, 185 Brigade. Landing on Sword Beach near Arromanches, his goal was to fight and capture Caen; most of his friends were killed but, as he commented, ‘we went on battling through France, Belgium and Germany until we reached Bremen, where Hitler surrendered.’ Richard was present at the Surrender Ceremony.

After the war, he commanded the 4th Battalion KSLI for three years in Shropshire, and was then appointed as a student at the Staff College at Camberley. On graduating he was sent as Chief of Staff of the 2nd British Infantry Brigade in Salonika; he held this appointment for three years, and although Greece was in a state of turmoil, he found time to explore all the sites of classical antiquity. There followed three years as a Staff Officer in India (more travelling in pursuit of the past); then three years as a Staff Officer in G.H.Q. Far East Land Forces in Malaya and Singapore (with frequent visits to Hong Kong); then came three years as Senior Staff Officer in Iraq (more archaeological expeditions). He then spent three years as Chief Instructor at Sandhurst, where he endeavoured to improve the syllabus. His final tour, of the War Office and B.A.O.R., was followed by retirement in 1966 with the rank of full Colonel.

On retirement Richard was offered the appointment of Grants Secretary to the Army Benevolent Fund in London. He held this post for sixteen years, travelling all over England in order to visit regimental headquarters; he was awarded the Queen’s Jubilee Medal in recognition of his
services to the Fund. The Chairman of the A.B.F's Executive Committee, General Sir Robert Ford, said of Richard that his ‘compassion, mature judgement, and generosity of spirit made him a much respected member of the staff at the Fund’s Headquarters.’ His real retirement, after August 1982, was spent in the company of his dear wife, Gilly, with whom he made many excursions to sites of classical archaeological interest in the Mediterranean lands and Near East.

His birthday and mine were a day and thirty-one years apart; in the eighteen years that we knew each other, he proved to be an entertaining, erudite and constant friend who is greatly missed. He had, in the last three years, suffered many serious falls which eventually took their toll on his large frame. He is survived by his wife, and the children of his first marriage: twin sons Christopher and Timothy, and daughter Lucy. The farewell made to his father by a Senior Classical Don at Winchester College, E.H. Blakeney, is equally appropriate for Richard:

Luceat ei pax sempiterna.

Yolande Hodson
Marginalia

The Hodson Award

To mark the fifteenth Anniversary of the founding of the Charles Close Society (on the 8th November, 1980), the chairman wishes to establish an Award which will recognise outstanding contributions made by individuals in furthering the objectives of the Society, as set out in the Object clause of the constitution. The Award will be primarily, but not exclusively, open to members of the Charles Close Society, and the first presentation will be made at the Annual General Meeting in May.

The details of the Award have yet to be finalised and further information will be given in the next issue of Sheetlines.

1996–97 Subscriptions

As is usual, enclosed with this copy of Sheetlines is notification for the payment of annual subscriptions to the Charles Close Society, which members are requested to pay by 1st March, 1996. You will see that the Society has maintained the subscription rates at the same level as the last two years, which must make it one of the best value for money societies.

Early payment will be very much appreciated by Roger Helleyer as it will make his task easier. You could always send your cheque off now, even if you post-date it for payment into the society’s account at the end of February. Equally, it would also make life easier for Roger if any members who are not renewing their membership, could write or telephone to let him know.

You will also see that on the bottom of the payment slip is a ‘one line questionnaire’; it would be useful for the running of the Society, and for thinking of its future, if the committee had an age profile of the membership. Ticking of the appropriate box would be appreciated. Those members who pay by standing order might give Roger a telephone call to give him the same information.

Apologies

I must make two apologies arising from the last issue of Sheetlines, the first to the Royal Geographical Society for omitting to acknowledge the source of figures 1 and 2 in Roger Helleyer’s article Sheet lines: some notes on GSGS 3917 and other one–inch large sheet maps of Ireland. This arose from having to remove the captions when cropping the extraneous material from around the map proper, and then failing to remember to replace the captions.

The second is to the Bodleian Library for four spelling mistakes in five lines — the very last item I typed before despatch to the printers, and I did omit to carry out a spell–check. I only trust that no member would have attributed the spelling errors to the University searching through all the notes that I made at the AGM, I am not able to find his name. I hope this omission will not cause offence, and I would ask on behalf of the Society that he contacts me again so that the idea can be progressed.

Monograph rebinding

Three members have reported that after a lot of use Guy Messenger’s Monograph on the One–inch Third Edition, Large Sheet Series the binding has been found to be less than perfect. They recommend having the volume Comb Bound at a local photo–copy/office services shop. The cost is usually about £1.

Please tell me again

In the April 1995 issue of Sheetlines (42), I did suggest in the Editorial that perhaps it would be useful to develop an accessible data base of references to Ordnance Survey history and products and their uses. One member did come forward and volunteer. Unfortunately, in spite of

Alan Godfrey Award
The Godfrey Award was awarded this year to Ralph Hyde, Keeper of Maps and Prints at the Guildhall Library. Ralph is a man of many talents and achievements, and in making the award the judges reflected on the fact that he organises map exhibitions virtually every year, often on unusual themes, this year’s being “Not to be Sneezed at — Images of London on Pocket Handkerchiefs”; and that his work has often spanned the divide between the history of maps and topographic prints, such as in his exhibition of panoramas and his recent book on the Bucks. The specially commissioned carving by Ralph Williams was, this year, an Arctic Tern, symbolising the great travellers.

The judges were Peter Clarke and Moira Courtman, while Alan Godfrey stood in for Donald Hodson who had to withdraw at short notice.

The Charles Close Society offers its congratulations to Ralph Hyde.

1996 Calendar

I have received from the International Federation of Surveyors a copy of their 1996 calendar (spiral bound) which is illustrated with thirteen (one on the cover!) examples of surveying instruments drawn from the last 500 years. The reproduction of the illustrations is superb, being of:

- Triangulation Theodolite, Kern (c1835)
- Astrolabe, Ibrâhîm ben Said (1068)
- Earliest surviving theodolite, Humphrey Cole (1586)
- Recording waywiser, Clink (18th century)
- Geodetic level No 5000, F.W. Breithaupt (1913)
- Surveying Quadrant, Christopher Schissler (1579)

Equatorial/azimuth sextant, William Burt (1836)
Heliotrope of C.F. Gauss, F.W. Breithaupt (1835)
Phototheodolite, J.H. Steward (c1900)
Azimuthal quadrant, G.F. Brander (1761)
11' Geodetic transit theodolite, Troughton & Simms (late 19th century)
Dividing engine, F.W. Breithaupt (1818)
Portable azimuth circle, attributed to Morin (c 1880)

For those who are so inclined, the illustrations would look very well framed.

The calendar is available from: Jim Smith, 23, Woodbury Avenue, Petersfield, GU27 2EE, at a cost of £10, plus £1.20 postage.

The Annual Map Market

With an increasing number of vendors at the Map Market, the committee have decided that some formalisation of arrangements are required to make the function more enjoyable for all. All sellers will be allocated a space, although they should indicate what space they would like when booking with the Secretary. To allow members who are willing to shift the furniture to have lunch, arranging the room will be from 1415 to 1445, with sellers having from 1445 to 1500 to set out their wares.

All vendors will be expected to have attended the AGM.

David Bednall

David Bednall has written to say Thank You to the many members of the Society who sent letters and cards, and who telephoned to wish him a speedy recovery during his recent illness. “The caring approach of members is one of the reasons that makes the C.C.S. such a good society. I seem to have recovered well from the heart attack and am now back buying and selling maps and books at book fairs and from home, although on a reduced scale.”
Ordnance Survey Topics

Your correspondent must apologise for not having kept readers as up to date with recent Ordnance Survey Information papers as he would have wished. His excuse is that these tend to appear twice a year, just after Sheetlines has gone to press, but as the latest batch appeared in late October, he has no excuse to sit on them!!

1:25,000 and 1:50,000 scales revision policy

OS Information Paper 1/1995 announced a new policy for both, which will be ‘customer-orientated’, ‘formal and clearly stated’, ‘co-ordinated between the scales’, ‘cyclic and more responsive to changes on the ground’, and ‘will look across the whole series and not just at individual map sheets’.

Each 1:25,000 sheet will be reviewed on a regular cycle, with a maximum interval of five years, ‘for change in the context of surrounding areas and with reference to 1:50,000 scale mapping and source revision from the large scales database.’ As a result the sheet will be subject to either a ‘New Revision’, a ‘Selective Revision’, or an unchanged reprint. ‘The Revision Information Notes on the map will clearly indicate which option has been chosen. As the large scales rural revision programme progresses it will be possible to mesh in gradually with that and to produce a series which is far more up to date than at present.’

The existing continuous review of 1:50,000 mapping for important changes is to be developed further to make it more responsive to changes on the ground. A Geographic Information System has been developed to help manage small scales revision. ‘The basic cycle for each map will be a New Revision every 5 years, with intermediate Selective Revisions in between where major changes warrant a further publication.’ The amount of change incorporated in either category will depend largely on how much change has been recorded, but ‘will still also be partly influenced by affordability, i.e.... the overall cost and revenue targets for the 1:50,000 and 1:25,000... Whilst it is not possible to guarantee that every single feature on every map will be brought up to date at each Revision, the important features will always be updated.’

Your correspondent is not aware of any maps having yet been published which reflect the new policy, though he feels bound to observe that the possible convenience to contemporary users on the ground will be offset by the deterioration of the completeness of the 1:25,000 and 1:50,000 as an historical record, all the more so as OS maps are prima facie legal evidence. The notes ‘Revised for selected change 19...’ which appear on the new 1:25,000 Explorer maps and the ‘Edition A published 1982’ on the new (edition A2) of Sheet 124 are hardly satisfactory. (Anyway, it was revised in 1982, and only published in 1984!)

OS agency status and (non-) privatisation

OS Information Paper 2/1995 described how OS was established as an Executive Agency on 1 May 1990, and was reviewed in 1993-4, both as to its performance to date and as to its future status. ‘Contractorisation [sic] was generally considered to be the least attractive option available. Privatisation was recognised as an option with some considerable advantages for government. However, a number of obstacles to implementation in the short term were identified and the costs and benefits were therefore difficult to quantify.’ It was therefore announced in October 1994 that OS would remain an Executive Agency for another four years. ‘In that time the obstacles to privatisation1 should be further investigated with a view to clarifying and overcoming them so that the costs and benefits can be established. A further review would be conducted once this work had been done.’

1 It would, of course, be most improper for the organ of an organisation with charitable status even to hint that one of the obstacles would be a general election in 1996-7 and the securing of a result favourable to privatisation.
Completion of large scales digitising and re-engineering large-scales digital data

OS Information Paper 5/1995 announced ‘with considerable satisfaction’ the completion in April of the initial digitising of the large scale mapping of Great Britain, which began in the early 1970s, and initially proceeded very slowly. ‘However, in the 1980s advances in technology and the development of cost-effective GIS systems began to generate the consumer demand for national data that Ordnance Survey had hoped for. Following lengthy and often difficult trials using potential contractors, a UK digitising industry was eventually stimulated and successfully developed, mainly in response to Ordnance Survey needs.’ This will provide the basis for a full national Superplan service through OS by December 1995.

OS Information Paper 9/1995 reported that, in order to go a stage further and create a ‘National Topographic Database (NTD)’, the data is to be ‘re-engineered’ (i.e. ‘rejigged’) so as to move away from being substantially a computerised version of cartographic data which stems directly from the 1:2500 as it has evolved since the mid–19th century. An NTD data specification is being developed, taking account of consultation with ‘our regular business contacts and bi–lateral consultation exercises with major user groups’ and also of the proposed National Interest Mapping Contract (referred to briefly below). Experiments with data conversion are to be put in hand immediately, and it is hoped for a pilot production trial covering an area of perhaps 500 5 x 5 km ‘tiles’ on the spring of 1996. ‘As soon as we are confident of the final specification and of our systems, production will accelerate. We expect the full programme to take between three and five years. Much will depend on the degree to which emerging technologies enable us to automate major elements of the data processing.’

Benefits of the re-engineering will include the ability to ‘enable polygons to be built at a “primitive” (smallest enclosing area) level. This will ensure that everyone has a common set of “landscape building blocks” for the new generations of GIS–based applications. This should minimise duplication and reduce confusion, particularly when information needs to be exchanged between users or between applications. The new “implied polygon” structure will also enable the polygon primitives to be aggregated easily, allowing land parcel identification and area measurement on an even more comprehensive scale than was available from ... chart paper.’ It is also intended that NTD data will recognise the continuity of features which pass under other features: for example, roadways will be shown continuously under railway bridges, instead of being interrupted as they have been hitherto. The data will also be ‘themed’, so as to differentiate natural and cultural features, and will permit distinctions between, say, residential land and that used for communications, and that used for roads and that for railways, and so on.

Large scales revision

OS Consultation Paper no. 7 of 1993 proposed four categories of large scale revision, being:

‘Category 1: Housing, commercial, industrial and public sector development and changes to the communication networks. These elements are seen as being of greater significance overall and will be surveyed within six months.’

‘Category 2: Change under Category 1 inadvertently missed and remaining unsurveyed more than six months after construction, but notified to Ordnance Survey by a customer, will be surveyed within three months.’

‘Category 3: Agricultural buildings, field boundaries, water details and forestry all grouped together as rural non–Category 1 features, to be surveyed on a five-year cyclic basis in agricultural areas and on a ten-year basis in mountain and moorland areas.’

‘Category 4: Private garages and minor alterations to buildings and other changes in all areas remaining unsurveyed will be tackled after the initial five-year sweep has been completed.’

‘Very limited feedback was received and no major disagreement was registered’ observed OS Information Paper 6/1995, which goes on to say
that for the past three years most OS revision effort has been on Category 1, and the backlog of work has now been sufficiently reduced to enable the goal to be pursued of surveying the more significant landscape change within six months of its happening. Category 3 revision was due to begin in April 1995. ‘As the initial five-year cycle is taken up, all major change in these areas will come within... Category 1 (six month response). The aim is to publish a planned revision schedule for each year of the cycle which will take into account customer needs and other external influences.’ (Added emphasis.)

The aim in 1995-6 is that 95 per cent of ‘significant change’ is made available within six months, and 99 per cent by [the year] 2000. This should be an improvement on anything which we have known hitherto, in comprehensiveness if not, perhaps, in democratic accessibility (for reasons of price). Cynics will no doubt point out that this is merely realising the spirit, at least, of ‘continuous revision’ as envisaged by the Davidson Committee nearly sixty years ago, but it is interesting that a full-scale (pardon the pun) revival of rural cyclic revision is envisaged.

An interesting recommendation

OS Information Paper 7/1995 reported that in November 1994 the Select Committee on the Environment investigated Ordnance Survey, and that the Chairman of the Committee has written to the Secretary of the State for the Environment ‘suggesting that Ordnance Survey should be recognised as the responsible agency for maintaining a definitive record of all official administrative boundaries and that Ordnance Survey should provide the common standard and the spatial template for making available a wealth of government owned, spatially–referenced datasets. The Secretary of State has accepted the proposals in principle’, and the matter is to be actively investigated by the Director General and the Chairman of the Inter-departmental Group for Geographic Information.

Survey should provide the common standard and the spatial template for making available a wealth of government owned, spatially–referenced datasets. The Secretary of State has accepted the proposals in principle’, and the matter is to be actively investigated by the Director General and the Chairman of the Inter-departmental Group for Geographic Information.

The ‘Pre-Build’ scheme

This was noticed briefly in Sheetlines 41 (p.5). OS Information Paper 7/1995 reports that a questionnaire intended to ascertain developers’ needs and their willingness to pay elicited only a 3 per cent response, and this will affect final recommendations by the Pre-Build Steering Group. One supposes that this will be the last to be heard of the scheme.

The ‘Pay Back’ on Going Digital

It may be remembered that in his paper to the Ordnance Survey bicentenary symposium in May 1991, Professor David Rhind suggested that any incoming Ordnance Survey Director-General should commission a study to find out what the replacement cost of the OS’s data would be. A couple of months later Professor Rhind was appointed DGOS, and, four years later, OS Information Paper 10/1995 reports on ‘An assessment of the value to the nation of the adoption by Ordnance Survey of digital mapping. Whilst this might not be quite the same as assessing the cost of replacing the OS ab initio, it is quite good enough to be going on with. It may be pointed out that digitisation was originally undertaken in order to improve conventional map production, rather than with a view to supplying data in non-map form.

The study was carried out by the OS’s Head of Finance. Its terms of reference were to ascertain (1) all direct costs of, and revenue from, digital mapping; (2) any indirect costs or benefits; (3) to conclude as to the overall financial success and benefits both to OS and to users. Assumptions made included: (1) estimates of manpower savings in cartography and reproduction resulting from digitising; (2) savings in survey costs, notably on account of the introduction of the Digital Field Update System (DFUS); (3) all costs incurred in the ‘end to end’ mapping process, such as the costs as well as the savings of DFUS, and costs of changing specifications in response to user requests; (4) research and development, administration, hardware and software costs; (5) costs and benefits of any products other than conventional types of map were ignored.
The total running cost of the OS between the commencing of digitising in 1973 and its completion in 1995 was about £1 billion, excluding any revenue from sales. The total cost of converting the mapping into computer form and creating systems to maintain it was about £120 million. This expenditure was not even, as the cost per sheet of digitising was much lower in later years. ‘The figures show that this cost has been recovered by a combination of savings accrued and revenues received.’ It is noted in conclusion that were digitising being started now, it would be carried out very differently, for technological and marketing reasons; and it is noted that the Dutch national mapping organisation has all its digitising carried out in Hungary, where the cost is about 60 per cent of what it would be in Western Europe. ‘Nevertheless, what was a brave step on the part of Ordnance Survey’s leaders and government Ministers in the early 1970s has turned out extremely well. This is true even on the narrow perspective deliberately taken in this study; the benefits to users of having up-to-date information in digital form have... been measured solely by the payments each customer has made to Ordnance Survey.’

‘Two other conclusions...: The first is that tangible benefits from major programmes of this kind are inevitably gained only in the long term; pay-backs over a period of, say, three or four years on a national information infrastructure development are very unlikely to be possible. The final point is that the data conversion cost has been a significant but minor part of the cost of running Ordnance Survey over the years: the greatest costs by far now come in updating the National Topographic Database...’

(This last certainly comes a surprise to your correspondent, who has assumed hitherto that one of the main obstacles to ‘full cost recovery’ has been the cost of the intensive digitisation programme!)

OS and CAD (Computer Aided Design)

OS Information Paper 11/1995 announced that, following market research, OS is to launch a new product - as yet unnamed - for use in CAD systems which will include site-centred data for the project in question, with simpler data supply contract and copyright arrangements, to be supplied on diskette and suitable for inputting into most leading CAD systems. It is intended to launch the new product in the summer of 1996.

National Interest Mapping Contract

OS Information Papers 6/1995 and 12/1995 reported that OS is to seek a ‘National Interest Mapping Contract’ with Central Government, ‘for services and activities undertaken in the national interest’. This might include some of the costs of rural revision, as well as of maintaining a historic data archive. Consultations ‘with a representative sample of our map users, mainly drawn from Consultative Committees and Learned Institutions’ are due to be completed by the end of November 1995, with a summary report to be published in the new year. ‘This will form the basis of discussions with Government on the appropriate level of activity and funding for non-commercial activities in the national interest... It is hoped that an agreement will be reached by... Spring 1996.’

No doubt it would be thoroughly cynical, and possibly quite misguided, even to suggest that this is a device for obtaining ‘full cost recovery’ so as to facilitate the privatisation of Ordnance Survey, analogous to the subsidising of rural railway services in order to make British Railways appear ‘profitable’. More seriously, a rumour from a little bird (weighing about 70 or 80 kilos) has come your correspondent’s way, to the effect that one element in a National Interest Mapping Contract would be the substitution of 1:5000 for 1:2500 for rural mapping: which seems as eccentric as it is sinister.

The future history of the landscape
Following earlier developments\(^1\), OS Information Paper 12/1995 announced that the OS’s commitment in its new Framework Document [sic] to ‘safeguard the historical and public record of the British landscape provided by Ordnance Survey maps and data’ has the copyright libraries to agree that they are permitted ‘to move away from being places of physical deposit to facilitating access to data stored elsewhere.’ Consequently OS is conducting a feasibility study ‘to evaluate the technical options of providing on-line access for libraries to non-current digital map data’, and four libraries have provided statistics on monthly use of OS maps.

Your correspondent seems to recall suggesting something rather similar at the original meeting to discuss this matter back in October 1992.\(^2\)


\(^2\) See Recording our changing Landscape (London, Royal Society, etc, 1994), pp 42-3.

The Internet’s latest victim

Readers with access to the World Wide Web (or ‘Internet’), with either curiosity or nothing better to do, can now access OS information pages. These include SINES, the Spatial Information Enquiry Service, which lists data sets held by government departments, and ‘many of the documents that are currently available to customers and the public at large’, including much of the information in map catalogues, answers to some of the more frequently asked questions to OS’s HelpLine service, and the Information Papers issued in 1994 and 1995. The address is:

http://www.ordsvy.govt.uk/

Richard Oliver

The Ordnance Survey 1:10,000 map

At the International Cartographic Association meeting in Barcelona in September, and a few days later at the British Cartographic Society symposium in Exeter, there was exhibited an experimental version of OS 1:10,000 Sheet SK 63 SW (Keyworth, Notts). This was produced from 1:2500 Landline data and was output on an inkjet printer: it includes outline in black, water in blue, contours in brown, woods in green, building infill in brown stipple and road infill in very fine brown stipple. (Three other similar experimental sheets were produced, each covering a different terrain type.) It may be recalled that in 1991 OS produced a monochrome 1:10,000 of part of Birmingham derived from Landline data, which was wholly automated, and was characterised by a ‘buzzing’ effect on account of the lack of generalisation of building outlines. SK 63 SW was produced by transferring the data into a separate database and then editing it. The result is vastly superior to the Birmingham sheet, on its own is a very good advertisement for large-scale digital mapping, and were the price to be affordable to a wide public (say £7.50 per sheet) it might be an attractive proposition. It is unlikely to go on sale for at least a year, and the price is likely to be set with a regard to its possible effect on sales of mapping and data at larger scales, so presumably the price will be more like £75. I am told by a reliable source that the 1:10,000 is not a big seller, and that the main purchasers are local authorities. SK 63 SW and any successors are therefore likely to be more attractive than ‘democratic’ maps.

Richard Oliver
One-inch engraved maps with hills: some notes on double printing
by Roger Hellyer

I. A curious act of vandalism

One of the consequences of the cumulative delays in the preparation of hachure plates for the one-inch engraved sheets in England was that in some cases the “second edition” with hills (NS-2-H)\(^1\) appeared so long after their outline editions (NS-2-O) that no sooner were they published than they were superseded by third edition printings (NS-3-H). The problem became more acute as the publishing programme moved north, reaching absurd proportions with NS-2-H: 7 and 11 which were announced in the Ordnance Survey Publication Report for January 1904 (OSPR 1/04), and had a life span of but four months before being superseded by NS-3-H issues announced in OSPR 5/04. More peculiar still is the case of sheets 1, 4, 5 and 6, none of which, apparently, were published in NS-2-H. But perhaps that is too pedantic a statement, because sheets 1, 4 and 5 are listed in OSPR, sheet 1 in 9/03, sheets 4 and 5 in 1/04, though no copies have been recorded. With sheet 6 the opposite is true: no NS-2-H version appeared in OSPR, but copies of it are known in the British Library (though not in the copyright set) and the Record Map Library of the Ordnance Survey at Southampton. If the publication reports are to be believed, sheet 6 led off publication of NS-3-H in the north with an appearance in OSPR 3/04, just a month after the initial block of Hampshire and Sussex sheets. Publication of NS-3-H:1-5 was announced at the end of the year, in OSPR 12/04.

Matters get “curiouser and curiouser” when one inspects embossed printing dates (EPD) on these sheets. It is strange that the earliest known copies of NS-3-H:1, 4 and 5 have EPD’s coincident with the NS-2-H OSPR references, which makes sheets 4 and 5 one month and sheet 1 a full five months older than any NS-3-H sheet as measured by the announcements in OSPR. It is stranger still that both recorded copies of NS-2-H:6 should have an EPD of 4.04, actually a month later than the publication of the NS-3-H version, and while at least this may explain why it seems never to have been published, it does not explain why it was ever made.

The situation moved towards the incomprehensible when I acquired a part set of NS-2-H sheets, which apparently included copies of the supposedly unpublished sheets 1, 4 and 5, with EPD’s 9.03, 1.04 and 3.04, dates obviously linked to NS-2-H references in OSPR. However, inspection of the printed publication dates - 1903, not 1897 (at this time hills editions carried the publication dates of their respective outline editions) - revealed them not to be NS-2-H at all but NS-3-H sheets on which someone had perpetrated a curious act of vandalism in scratching out the words “Third Edition” in the top left hand corner. Putting this down to a whim of the former owner, I thought no more of it until I discovered that copies of sheet 4 in the British Library, the Bodleian Library, National Library of Scotland and Trinity College, Dublin (I have not yet enquired at Cambridge) copyright sets of NS-2-H had received precisely the same treatment! One is inevitably led to the remarkable possibility that an employee of the Ordnance Survey itself was responsible. But why? Why go to such lengths to make a map look older than it actually was? It is hardly credible that there was so a great a demand from collectors of NS-2-H for the completion of their sets as to pass off NS-3-H sheets by deception. Furthermore, why announce them in OSPR as NS-2-H sheets when actually they were NS-3-H, and why then repeat their announcement as NS-3-H at the very end of 1904 when they had already been available for some months, and, in the case of sheet 1, for more than a year? And do further copies of NS-3-H:1 and 5, other than my own, exist with “Third Edition” scratched out? It is worth noting that none of the NS-2-H sets in the copyright libraries mentioned above include copies of these sheets, though it is significant that the British

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\(^1\) Richard Oliver: What's what with the New Series, *Sheetlines* 5 (1982), 3-8. I have employed Richard Oliver's system of abbreviations for identifying map series which he first expounded in *Sheetlines* 5, p.3. The first element, NS, S or I stands for New Series, Scotland, Ireland; 1, 2 or 3 means first, second, or Third Edition; the third element O or H stands for outline or hills edition.
Library and National Library of Scotland NS-3-H sets have two unmutated copies of each with accession dates obviously coupled both to the December 1904 OSPR reference and to the earlier supposedly NS-2-H references. But perhaps the truth of the matter is that NS-2-H:1, 4, 5 and 6 actually were published? It would be most interesting if any collector or library assuming they have copies, with either black or brown hills, could inspect publication dates and EPD's, also the top left hand corners for any evidence of deletion, and report their findings to the author or the editor. We would especially like to know of any sheets 1, 4 or 5 which actually prove to be authentic NS-2-H issues.

Details of the above in tabular form:

<table>
<thead>
<tr>
<th>Sheet</th>
<th>NS-2-O Pub</th>
<th>NS-2-H EPD</th>
<th>NS-2-H OSPR</th>
<th>NS-2-H Vandalised EPD</th>
<th>BL Accn</th>
<th>NS-3-O Pub</th>
<th>NS-3-H EPD</th>
<th>NS-3-H OSPR</th>
<th>NS-3-H BL Accn</th>
</tr>
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<tr>
<td>1</td>
<td>1897</td>
<td>-</td>
<td>9/03</td>
<td>9.03</td>
<td></td>
<td>1903</td>
<td>9.03</td>
<td>12/04</td>
<td>11.03</td>
</tr>
<tr>
<td>2</td>
<td>1897</td>
<td>2.02</td>
<td>3/02</td>
<td>-</td>
<td></td>
<td>1903</td>
<td>3.04</td>
<td>12/04</td>
<td>2.05</td>
</tr>
<tr>
<td>3</td>
<td>1897</td>
<td>10.02</td>
<td>10/02</td>
<td>-</td>
<td></td>
<td>1903</td>
<td>3.04</td>
<td>12/04</td>
<td>2.05</td>
</tr>
<tr>
<td>4</td>
<td>1897</td>
<td>-</td>
<td>1/04</td>
<td>1.04</td>
<td>5.04</td>
<td>1903</td>
<td>1.04</td>
<td>12/04</td>
<td>5.04</td>
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<tr>
<td>5</td>
<td>1897</td>
<td>-</td>
<td>1/04</td>
<td>3.04</td>
<td></td>
<td>1903</td>
<td>3.04</td>
<td>12/04</td>
<td>2.05</td>
</tr>
<tr>
<td>6, 7, 11</td>
<td>1897</td>
<td>4.04</td>
<td>-</td>
<td>-</td>
<td></td>
<td>1903</td>
<td>2.04</td>
<td>3/04</td>
<td>6.04</td>
</tr>
</tbody>
</table>

II. The background

With all Old Series one-inch maps it was Ordnance Survey practice to engrave hachures in the same copper plate as the topographical detail. When north of the Preston-Hull line additional plates for outline editions were also required, these were duplicated from the original plates before the engraving of the hachures: any contours were added to the duplicate plate, the hachures were engraved in the original.2 The same principles applied to the earliest New Series sheets, except that since contours now also appeared on the hachured edition, the duplication of the plates presumably followed their addition.

“The hills of course do not alter, and therefore......require no revision”.3 It was perhaps inevitable that a process be developed whereby the necessary revision of topographical detail in copper plates would not continue to risk damage to features therein which were permanent and immutable, such as the hachures. By 1889 it had proved technically feasible to separate topography and hachures on to different plates and on printing achieve a perfect marriage in the registration between the two.4 Richard Oliver has noted a series of double printed experimental sheets made in 1890, one of which was NS-1-H:345, engraved in black with brown hachures, which was presented to the Royal Geographical Society in June. This is the earliest known sheet to have its hills engraved in a separate plate, though it was not until December 1892 that it formed one of the first batch of double printed maps actually to be made for sale to the public.

Engraving topography and hachures in separate plates had at least three advantages. The previous practice had necessitated that all

4 A description of the making of separate hill plates is given in the Appendix.
topographical revision be entered twice, once in the outline duplicate, and once in the original outline plus hachures plate. The latter was a much more difficult task with the ever present danger of damaging the hachures. With the hachures safely on an independent plate, the job became straightforward and moreover only had to be done once. Secondly, the hills plate could be reused as a master for subsequent new editions, including the imminent coloured editions with hachures. The third principal advantage was to the user, since much improved clarity was the consequence of printing the hills in another colour, if required. In spite of these advantages, it evidently proved impractical to begin publication of engraved hachured maps by the double printing process until early in 1893, though the single printing of hills was not finally phased out until 1895.

It is pertinent to outline what had been achieved by the earlier process. The situation is most clearcut in Scotland, where between 1856 and 1894 all 132 S-1-H one-inch sheets were produced with hachures and outline on single plates. In Ireland, 200 of the 204 I-1-H sheets (there are no hills in sheet 50) had been single printed between 1855 and 1895, sheet 157 being the last single printed hachured map to be made anywhere in Great Britain or Ireland, in October 1895. Separate hill plates were engraved in 1895 for the four remaining sheets, 136, 145, 146, 156. Both outline and hachures of these sheets were printed from transfers to zinc rather than the copper plates. In England and Wales the situation was more complex. The New Series nominally comprised 360 sheets. Through the non-appearance of sheets 243 and 260, and the combinations of 36/45/46/56/57, 81/82, 117/133, 192/209, 261/262, 291/275, 357/360 this total was reduced by twelve. The requirement for hachured editions was further reduced by six thanks to the lack of land high enough on sheets 91, 144, 226, 259, 321 and 354. In England single printing of hachured sheets ceased in 1892, by which time there were one contoured and 68 unkontoured sheets in the range 1 to 73 (reprints of the “Old Series”), made between 1847 and 1874, and 12 others, with contours, made since 1878: 273, 274, 284-286, 289, 290, 300, 301, 304-306. In sum, therefore, it had taken 38 years to produce 132 Scottish sheets, 40 years 200 Irish sheets, and 45 years to produce 81 English sheets out of a grand total of 678 overall.

The task that lay ahead did not entail the loss of hachures from any of these 413 sheets, since the hachures could be separated out from each existing plate. A matrix was taken by electrotyping, from which all detail except the hachures was removed by scraping with a graver. A duplicate was taken from the scraped matrix to be kept for record purposes, and from it a printing plate made by the usual methods. This process was used in England, but it was still time consuming, and replacement NS-2-H versions of the 12 single engraved sheets south of the Preston-Hull line were not announced in OSPR before June 1899, and publication of the 68 north of it (the Isle of Man sheet was never done) was only completed in 1904, the last few apparently in NS-3-H, as was discussed in section I. Meanwhile production of NS-1-H sheets continued, from December 1892 with separate hill plates, and at most a further 28 sheets were made before April 1895 when the first NS-2-H sheet (315) was announced, a mere ten months following the NS-1-H issue of that sheet. Eventually 60 NS-1-H double printed sheets were to be produced by the end of 1898,7 by which time the first revision of England and Wales was sufficiently advanced everywhere to permit work on NS-2 sheets to supersede NS-1 and for the residual NS-1-H work therefore to be abandoned.


Sheet lines of the Small Sheet Series of One-inch maps of England and Wales
In many cases the same compression of the time scale between NS-1-H and NS-2-H production occurred as between NS-2-H and NS-3-H. NS-1:H:93, 162, 200, 264 were all listed in OSPR in the latter half of 1898, less than a year before OSPR 6/99 announced the replacement by NS-2-H of all but one of the 72 NS-1-H sheets made south of the Preston-Hull line, though palpably several had been replaced earlier. The exception was NS-1:H:313, of which a copy exists in the Record Map Library with EPD 7.98. This sheet appears not to have been issued, being superseded by NS-2-H in OSPR 9/98.

The engraving of separate hachure plates clearly speeded up production of hills sheets, though demonstrably the increase was from adagio to perhaps moderato. I wrote to Sheetlines in 1989 to remark upon a marginal note from the hills engraver C.S. Fuidge which survived to appear on NS-2-H:265, that it had taken him 346 days to engrave its hills at a cost of £350, and there is no evidence to suggest that this may in any way have been atypical. Fuidge's name after all appears often enough on engraved sheets to suggest his was a much practised hand.

In parallel with the engraving programme, and in order to widen the coverage of the hills edition by faster if temporary methods, the Ordnance Survey turned in 1892 to zincography. The process called for the transfer of the outline plate to zinc: hachures were independently drawn, in an earlier stage, but later with much greater refinement, and were coupled with the zinc outline, first by photozincography, from 1893 by heliozincography. All the examples seen have these hachures in a second colour. Richard Oliver made reference to this, adding the remark that production of hills sheets by zincography had been envisaged for military use when the New Series was authorised in 1872. In 1886 some of the North Kent sheets had been zincographed, probably for military use, and there is a copy of sheet 273 in the Record Map Library, with the hills depicted by horizontal hachures in grey. Sheets 271 and 272 were probably also made, with conventional vertical hachures, and respectively 1892 and 1893 reprints are known, 271 in private hands, 272 in the RCHME collection now at Swindon, both with hachures in brown.

In 1892 the Ordnance Survey began publication of the “Advance Edition with Hills”, which, after one sheet made in June 1892 (343), became the “Temporary Advance Edition with Hills”, and it is quite conceivable that these reprints of sheets 271 and 272 were made to supplement this edition, though if so they were quickly superseded by engraved NS-1-H editions late in 1893. They also never carried the edition title. We were offered in Sheetlines an illustration of sheet 161 in an “Advance Edition with Hills photozincographed”, with an issue date of 1892. In the event the illustrated map would appear to have been a prototype, because the published version of sheet 161 did not appear before 1894. The interested student here has perhaps a unique opportunity for detailed study, because not only were the hachures in the published version produced by helio-, not photozincography, but also they were redrawn. By 1897 the Ordnance Survey had gone on to make 74 England and Wales sheets by these processes.

The Temporary Advance Edition with Hills was only intended as a stop-gap and its sheets went out of print as engraved editions gradually superseded them. The first to disappear was sheet 242 which went late in 1894, almost as soon as it was made. By the end of 1898 nine sheets, 162, 224, 241, 242, 327, 328, 341-343, had appeared in NS-1-H form. The remainder would be replaced by NS-2-H editions starting in 1896 with sheets 223 and 240, and ending with the announcement in OSPR 2/03 of NS-2-H:127, as it happens one of the batch of six sheets (76, 77, 105, 119, 127, 150) which completed the programme of drawing and engraving the 678 one-inch plates with hachures required to cover the British Isles.

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Zincography remained a tool in the making of hill sheets in England and Wales until 1897. Two years later it was again called upon to expedite the production of a hills edition based on the first revision in Scotland (S-2-H) where, it will be recalled, all 132 sheets had hills and outline engraved on the same plate in S-1-H. Experience with the English sheets had taught the Ordnance Survey that dividing outline and hills into separate engraved plates for so many sheets could take a decade or more, and the S-2-H edition was required much sooner than that. Thus the newly revised outline editions (S-2-O) were transferred first to zinc, later on to stone. The hills were transferred from the S-1-H copper plates to a second zinc or stone via an impression in ink on paper from which all unwanted detail was removed by scraping. Such was the speed of production that the whole S-2-H edition was published by zincography or lithography between 1899 and 1902. The use of lithography permitted the combination of sheets 57 and 57A, so the edition appeared in 130 sheets, including the already combined 42 and 50, and the unrevised sheet 123. An acceptable, though temporary solution having been achieved, the permanent work of transferring the S-1-H hachures to independent copper plates began almost immediately, presumably by the same methods as in England. But only sheets 1-3 had appeared in engraved S-2-H editions beginning late in 1903 before the application of engraved hills to S-2 sheets was abandoned in favour of S-3 issues.

So again we reach a watershed, in 1904. A year earlier the coverage of the entire United Kingdom by hill plates where necessary had been achieved. Work on the last of the English “Old Series” hachure plates to be separated from the outline, sheet 6, was completed, and published in NS-3-H in March 1904, and, remarkably, apparently printed in NS-2-H one month later. Separate hill plates for sheets 1, 4 and 5 had been made and printed a few months earlier in NS-3-H (almost certainly never NS-2-H) even though not formally announced until the end of 1904. In Scotland three engraved sheets (1-3) had been double printed in S-2-H, leaving 129 still to do (assuming the theoretical intention of making sheet 50, the land areas of which even in S-1-H had also been coupled with sheet 42). S-3-H sheets with double printed hills would be announced from February 1905. In Ireland, after the publication of the four I-1-H sheets 136, 145, 146, 156 in 1895, there seems to have been no further work done on independent hills plates, though three of these plates were anachronistically combined in 1903 with I-2-O uncontoured originals in the making of the OSI Office Record set. The hill engravers’ energies were obviously being concentrated first on England and Wales, then Scotland.

But the programme of making independent hills plates was destined never to be completed: sometime in 1911 the decision was made to discontinue publication of engraved maps with hills, presumably for lack of public support. The last hills sheets in Great Britain were announced in OPR 10/11: they continued in Ireland until March 1912. Publication was unfinished in all three countries, and the reason was in essence the

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12 I quote the official record as in Johnston 1902, p. 187: An impression is pulled with the copper-to-stone ink and paper; this is kept flat and fastened to a drawing board with pins; all the outlines, detail, and ornament are removed from its surface by scraping, cleaning the dust off immediately with a camel hair brush. The transfer is then damped to the set expansion and transferred to stone, washed clean, and the stone prepared with citric acid and dusted over with chalk; a draftsman then goes over the whole, and carefully makes good with tusch, the erased patches, at the same time assimilating the hill features, where necessary, to make them agree with the revised detail plate. When this is done the stone is returned to the printer and proved. At the same time a transfer is pulled from the revised detail plate, with the same ink and paper as the above, which is laid down and transferred to stone in the usual way. Great care is necessary in damping and transferring these transfers in order to get them on the two stones exactly to the same measurement. The hill plate is first printed in a tint composed of sepia and a touch of crimson; the outline or detail is then registered to this, in black, from the detail plate.

13 This method was also adopted for those sheets in NS-2-C, S-3-C and almost the entire I-2-C for which independent hill plates did not as the time of their making exist, many of which carry the legend “Printed from transfers to stone”. Where an independent hill plate already existed, the transfer was, of course, taken direct from it.

Sheet lines of the Small Sheet Series of One-inch maps of Scotland
Sheet lines of the Small Sheet Series of One-inch maps of Ireland
(Map by Courtesy of the Royal Geographical Society)
same, though there were different parameters in each case. In England and Wales the programme of making separate hills plates had at least been completed, and as NS-3-0 and NS-4-0 sheets were published, it was possible immediately to supply a hills edition. That no more than 329 sheets with hills (four of them NS-4-H) were published was simply because issue of NS-3-0 was not completed until 1913 and NS-4-0 was only in its infancy. In Scotland, S-3-0 was not complete before 1912. But there was here an additional factor in that there were in existence independent hills plates of only three sheets when S-3 publication started. It is perhaps remarkable to report, therefore, that as many as 104 sheets were published with hills before cessation in 1911, leaving only 28 outstanding.

In Ireland it was not until 1909 that the publication of double engraved hill editions could even be begun. I-2-O had been published between 1899 and 1902 without contours, and rather than proceed directly to a hills edition, it was evidently considered essential to add contours to the outline edition first. Contoured I-2-O sheets began to appear in 1908, but it proved impossible to complete the edition until after the war in 1919. Following hard upon its heels in 1910 was the contoured I-3-O, only to be abandoned in 1917 after the printing of some 131 sheets.\(^{15}\) The leeway that separated the publication of an I-2-O sheet from an I-3-O was again often merely a matter of months, and forming an integral part of the consequent publication complex were the new double printed hachured editions, I-2-H and I-3-H, now of course benefiting from the contours in the outline plates. Oddly, of the four sheets already double printed in I-1-H, 136, 145, 146, 156, only the last was to make another appearance, and that only in I-3-H in the final batch of all in March 1912. Altogether 66 further separate hills plates were made for the Irish one-inch map, presumably as in England by separating the hachures of the I-1-H edition from its unwanted topography: 49 of these would be issued in I-2-H between 1909 and 1911\(^{16}\), 50 I-3-H (including sheet 156) between 1910 and 1912;\(^{17}\) 32 appeared in both versions. Perhaps the most concentrated publication sequence was that of sheet 171, with I-2-0 in OSPR 3/09, I-2-H in OSPR 9/09, I-3-0 in OSPR 8/10 and I-3-H in OSPR 9/10. One feels compelled to conclude by asking the question why it seems to have been so important to publish so much “second edition” material based on the first revision in the knowledge that a “Third Edition” second revision map might be only months away? We have noted the apparent duplication of effort three times in this paper, so evidently it was a constant part of Ordnance Survey practice. It occurred in 1898-99 between NS-1-H and NS-2-H, in 1903-04 between NS-2-H and NS-3-H, and now again in 1909-11 with both Irish I-2 and I-3 editions. The author would welcome an explanation for what superficially appears to be a wholly unnecessary duplication of resources.

\(^{15}\) Following a visit to Ireland, I am happy to be able to revise my footnote 7 in Sheffield 43, p6. 131 Third Edition sheets are now known: 1-31, 33-38, 45-50, 57-61, 70, 71/72, 101, 125, 127-205. Sheets 33, 36, 45, 101 thus do exist, but are so far recorded only in lithographic, not engraved, issues, 101 being an OSI imprint.

\(^{16}\). The sheets are 2, 6-8, 12-14, 18-21, 28, 142, 149-152, 159-166, 170-177, 183-188, 190-192, 194-196, 200-202, 205. Sheets 182, 197-99, 203, 204 are listed in OSPR 9/09 but have not been recorded.

\(^{17}\). The sheets are 2, 156-176, 178-205.

**Appendix: The making of separate hill plates**

The making of separate hill plates is summarised in two paragraphs in *Precis of the Methods & Processes of the Ordnance Survey* (1895):

p.13: The hill features are engraved as a separate plate in the following manner:- A photograph of the six-inch map is made on the one-inch or two-inch scale. This is taken to the field and the hill features are inserted on it. (In some portions of England the hill sketching is done on the six-inch scale). A finished brush drawing is then made from the field sketch, the former serving as a guide to the engraver. The hills are put on the plate partly by a graver and partly by etching, and a matrix and duplicate are
then made. The great difficulty in engraving the hill features is to keep the different ranges of hills in proper subordination. Great clearness can now be attained by printing the hills in a different colour to the outline, and this is effected by double printing from copper.

p.15: For the hill engraving, the plate is first waxed over and a transfer from the outline plate is rubbed down on it. From this outline the engraver selects guiding lines and cuts them lightly on the copper. The wax is then removed and the plate covered with an etching ground, the engraver then makes a tracing on gelatine of the general shape of the hill features, this tracing is rubbed down on to the plate with red chalk, leaving a trace on the etching ground which guides the engraver in laying down the lines representing the hills. He draws in these lines with a fine etching needle, and as soon as he completes a portion of the plate, he proceeds with the "biting in". A wall of wax is placed round this portion of the plate, and dilute "aqua fortis" is poured in and kept there until the lines have been sufficiently bitten. After each "biting up" the lines that have reached the necessary depths of shading are covered with varnish and thus protected from further action by the acid. This process is repeated until the deepest shades have been obtained. The whole plate is last of all gone over carefully with the dry point to bring the whole work into proper order, and the detail lines which were cut to guide the engraver are burnished out. The plate is used by double printing in conjunction with the outline plate to add the hills to the rest of the work.

Scottish Popular Edition Covers

Tim Nicholson asked in Sheetlines 38, p. 48, whether the titles on the Scottish Popular Edition covers were especially liable to misprints. Apparently ‘yes’: here is a third example.

It would be interesting to read the memoranda between Edinburgh and Southampton which followed such misprints. Were the maps recalled for new covers? How many members of the public became convinced that the mis-spelling was the correct one – even in Scotland?
Mirrors of History – (2) Bomber’s-eye-view

Tim Nicholson

Between June 1940 and June 1943, Southampton suffered 57 attacks by the Luftwaffe, during which 475 tons of high-explosive bombs and countless incendiaries were dropped; 650 people were killed and thousands injured.

On the nights of 30th November and 1st December, 1940, the Ordnance Survey headquarters in London Road were severely damaged. Less dramatic, but almost as telling, is another statistic – the city’s rateable value fell by almost 12½%, the third biggest percentage fall in Britain outside London. Almost all the attacks were concentrated into the 11 months June 1940 - July 1941.

The city’s complex Civil Defence organisation, which battled to contain the devastation, was hand detailed in red, green and black on a 1000/41 reprint of the OS Six-inch Town Plan of Southampton. An extract is shown here, its scale unsettlingly suggesting the view that a German bomb-aimer might have seen, although some attacks were low-level machine-gunning passes designed to sow panic.
The sheet lines and overlaps of the One-inch Fifth and New Popular Editions
by Richard Oliver

The Ordnance Survey One-inch (1:63,360) New Popular Edition map represented a curious mixture of the makeshift and the permanent. On the one hand, it was begun in 1938 as a continuation of the One-inch Fifth Edition, with a recasting of Fifth Edition mapping on new sheet lines as its starting point, and it was never properly completed; over half its cover of the mainland of England and Wales was provided by the obsolescent ‘old’ Popular Edition, and the sheets for Scotland and the Isle of Man were not published at all. On the other hand, it was laid out on, and bore on its face, the Transverse Mercator metric National Grid; its sheet lines were intended to provide a fresh start for the national One-inch map, and those sheet lines were retained for its successor, the Seventh Series, which was anything but a makeshift, and might have had a much longer career but for the advent of metrication shortly after its completion.

Sheet lines: Cassini and Transverse Mercator

That there was a problem at all with one-inch sheet lines was because in 1928 the Ordnance Survey had adopted the Transverse Mercator projection with its central meridian at 2 degrees west longitude and a yard-based reference system as a basis for its new small-scale maps. The Transverse Mercator (known to the OS at this time by its alternative name, Gauss Conformal) appears to have been chosen as much for its suitability for military purposes, as it enabled true bearing to be shown, as for any other reason. The timing of its adoption was somewhat unfortunate, in that in 1928 the OS was half way through converting the One-inch map of Scotland from the Bonne to the Cassini projection on the meridian of Delamere, which entailed a change of sheet lines. Adopting Cassini–Delamere had the advantage that the new Popular Edition of Scotland could be treated for practical purposes as a continuation of the One-inch Popular Edition of England and Wales, but a difficulty was that the latter was an obsolescent map, based on engraving. For some time it had been policy that the next general revision of the One-inch of England and Wales would be accompanied by redrawing, so that, like the new map of Scotland, it could be reproduced by heliozincography. Had the Cassini projection been retained, no difficulty would have arisen, as the sheets of the Popular Edition of England and Wales could have been replaced by the heliozincographed successor.

It would have been possible to have retained the sheet lines of the Popular Edition for its successor, but at a price of any grid printed on the map face not fitting the sheet edges neatly, and of the neat lines being at least theoretically curved, because of the change in projection is a curved line on any other. Grid lines printed at an angle to the sheet lines were acceptable for military purposes, as exemplified by the military versions of the Popular Editions, but were evidently regarded as unacceptable for civil mapping. Therefore, the new ‘Gauss Conformal one-inch’, which came to be the Fifth Edition, would have to have new sheet lines, so that it would fit the grid comfortably and vice-versa.

New sheet lines were duly adopted. With the wisdom of hindsight, it may be questioned whether the solution – or rather, the initial solution – to the problem was the right one. It was a partial assimilation of the Fifth Edition to the Popular Edition.

The Popular Editions covered Scotland in 92 sheets and England and Wales in 146 sheets, a theoretical total of 238 sheets for Great Britain. In practice, only 235 sheets were needed for national cover, as two sheets (86/3 and 89/5) bore dual numbering, and England Sheet 1 was wholly duplicated by Scotland Sheets 75 and 81. The only reason for publishing Sheet 1 at all would appear to be that the sheet lines and numbers for England and Wales had been drawn up before the decision was taken to recast the map of Scotland on Cassini–Delamere sheet lines. This might also explain why one sheet layout was numbered in two groups, though as the recasting of the Quarter-inch map at about the same time on one set of sheet lines also used
separate number series, which were retained on a further recasting in 1933, the numbering may have been as much a sop to national sentiment as anything else. (After all, it took the imperative of a ‘corporate image’ and ‘house style’ in the late 1960s to dislodge the lion from the covers of OS Scottish small–scale maps.)

The sheet lines of the Popular Edition were heavily influenced by the choice circa 1839 of the meridian of Delamere for the northern block of sheets of the first one–inch mapping of England. When this ‘old series’ map was substantially replaced by a ‘new series’ between 1872 and 1896, it retained the northern ‘Delamere’ block, and the sheets for the remainder of England and Wales were laid out as a continuation of it. The ‘Delamere’ sheets were relatively small, 18 by 12 inches (45.73 x 30.49 cm) within the neat lines, and as well as serving as sheets in their own right, they also served as a basis for other sheet lines: as groups of first four and then nine for the Half–inch map, as groups of twenty–five for a quarter–inch series, and as groups of nine for blocks of four one–inch ‘large sheets’. There were two ‘large sheet series’, one in 152 sheets of 1906–13 based on the One–inch Third Edition which is generally known thus, and the other in 146 sheets of 1918–22 which is generally known as the Popular Edition, but which appears as ‘large sheet series’ on at least one early index. The Popular Edition sheet lines were controlled both by the grouping of blocks of nine 18 x 12 inch small engraved sheets to produce four 27 x 18 inch (68.61 x 45.73 cm) sheets, and by these blocks of four being mostly laid out to form what were in effect quarter–sheets of the 27 x 18 inch Half–inch sheets which had in turn been formed in 1906 by grouping blocks of nine small 18 x 12 inch engraved sheets. For the Quarter–inch Third Edition the process was reversed, in that the sheets for England and Wales were mostly formed by grouping four Half–inch sheets, so that the Half–inch sheets mostly became in effect quarter–sheets of the Quarter–inch. This co–ordination of One–inch, Half–inch and Quarter–inch sheet lines was intended to facilitate revision.

The scope for flexibility in laying out the Popular Edition sheet lines was therefore very limited, and the only deviations from a rigid butt–jointed arrangement were around the coast, where landward overlaps were introduced in order to avoid publishing sheets containing mostly sea. This resulted in a number of sheets which only contained a limited area of land not covered by other sheets, and which might have been eliminated had there been less rigid insistence on butt–jointing wherever possible. Thus Sheet 29 was moved 9 miles east of its theoretical butt–jointed position, giving a corresponding overlap on Sheet 30, Sheets 30 to 33 were in their ‘correct’ position, and a 9–mile gap in Holderness was covered by Sheet 34, which as originally proposed in 1914 was to overlap Sheet 33 by 18 miles, and which instead was published in 1924 turned on its end to provide a 9–mile overlap onto Sheets 39 and 40. The end–result has probably served as much to intrigue historians as to guide contemporaries; it might have been more appropriate to produce it as a prototype coastal zone map. Somewhat greater flexibility was allowed for the sheet lines of the Popular of Scotland, notably in the staggering of the northern three rows on the mainland, and a minimum overlap of 1 mile (1760 yards, 1.61 km) was provided between each sheet, although some overlaps were much wider, such as the 6 mile (9.66 km) south–north overlap between Sheets 65–7 and 71–3.

The first ‘sheet line solution’ for the Fifth Edition was a layout in 146 sheets, with a standard sheet size of 50,000 yards west–east by 30,000 yards south–north on the ground, equal to 28.409 by 17.045 inches (72.19 x 43.31 cm;

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1 So far, no documentation on the adoption of the Delamere meridian has come to light: I date it to 1839–40 on the grounds of the earliest surviving index showing the ‘Delamere’ sheet lines being printed no later than the spring of 1840: it is in Public Record Office (PRO) WO 44/702.
2 Plate 3 in Report...Ordnance Survey...1913–14 (HMSO, 1914).
3 See OS annual report for 1912–13. The subject–matter of this paragraph will no doubt be considered in more depth in Dr Yolande Hodson’s forthcoming study of the One–inch Popular Edition of England and Wales.
mapped area 484.23 square miles or 1254.17 sq km) at one–inch scale, as compared with the 27.0 by 18.0 inches (486.0 square miles, 1258.76 sq km) of the Popular Edition. To get round the difficulty that the new sheet size was too wide and not tall enough to replace the Popular Edition exactly, even without the complication of changing projection, two bands of 10,000 yard (9.15 km) overlaps were introduced to absorb the horizontal excess, and three rows of sheets 40,000 instead of 30,000 yards south–north on the ground were introduced to supply the vertical deficiency. (Fig. 1.) 50,000 by 40,000 yard sheets were also used elsewhere, either for a comfortable fit along the coast (e.g. Sheets 87, 131–4), or to improve cover round important centres (e.g. Sheets 96, 106–8), and some 30,000 or 40,000 by 50,000 yard portrait–shaped sheets were used around the coast. Where there was no other overlap, each sheet was extended 2,000 yards (1.14 miles/inches; 1.83 km, 2.90 cm) north and east to give a built–in overlap, as compared with the 1,760 yards (one inch on the map) of the Popular of Scotland. The end–result was a superficial resemblance to the Popular Edition, but often with considerable local differences in the incidence of sheet lines for sheets bearing the same number: thus, for example, the eastern edges of Fifth Edition sheets 96, 107, 115 and 125 lay some 1 to 1.5 miles to the west of the eastern edges of the Popular Edition sheets bearing the same numbers, and the south edge of Fifth Edition Sheet 125 lay some 4 miles north of the south edge of Popular Edition Sheet 125. It is possible that the thinking was that by retaining the old numbers inconvenience to the public would be minimised, particularly as it was only ten years or so since the changeover from the Third Edition Large Sheet Series to the Popular Edition, but one certain instance is known of the change in sheet lines resulting in lost sales5, and one may suspect that there were others. With the wisdom of hindsight, it might have been better to forget all about trying to reconcile Popular and Fifth Edition sheet lines, and to have begun afresh, with a new standard sheet size.


The overlaps

The Popular Edition of Scotland has not been studied as intensively as the One–inch maps of England and Wales of 1918–40, and the reason for introducing the minimum overlaps is as yet unknown. The justification for guaranteed minimum overlapping on any map series is that it assists the transition from one sheet to the next where there is complicated detail, for example road junctions straddling the sheet edges; against this, the multiple publication of the same detail entails extra work for the map producer, leading to such phrases as ‘bleeding chunks’.6 The heliozincographic production method used for the Popular of Scotland and the Fifth Edition of England, which was based on pen–and–ink drawing in sections which could be assembled as effective building blocks for photography, was slightly more suited to this than was the previous method of making transfers from copper plates on to stone, as used for earlier coloured One–inch maps, including the Popular of England, but it still entailed some multiple drawing of road, wood and water infill, (where four butt–jointed overlapping sheets met the area falling on all four sheets would have its infill drawn four times over). Although this drawback had been recognised by about 1934, and possibly some years earlier,7 the benefit to map users was presumably felt to outweigh the inconvenience to the producer, the OS; otherwise, the introduction of the Fifth Edition would have been as good an opportunity not to perpetuate minimum overlapping in England and Wales as to introduce it. In the event, the opportunity was not taken.

One advantage to the producer of overlaps is that it is possible to treat the map as ‘sheetline–free’ for certain purposes, notably the placing of names: on a non–overlapping map, any name which is fitted in between the feature referred to and the neatline may have either to be compressed or, if it is written in the ‘normal’ style, will effectively foul the border, necessitating an extrusion on one sheet which is

6 Observation by Ian Mumford, Charles Close Society meeting, London 13 June 1987. It is assumed that the reference is to Wagner rather than to Shaw.

7 See H.S.L. Winterbotham’s ‘Handover notes’ (From this...to that) in OS Library, Southampton.)
not repeated on its neighbour, and thus make continuous mounting difficult (Fig. 2A); with overlaps, this difficulty is removed, and any extruded name or feature should automatically repeat on its neighbour (Fig. 2B). By careful name–placing it is possible to avoid either compression or extrusion on non–overlapping sheets; but extrusions may occasionally be necessary for symbols, such as for churches, windmills or railway stations, which must be shown in their exact position on the ground. Examples of such occasional extrusions may be seen on a number of One–inch Seventh Series and 1:50,000 sheets (Fig. 3).

The systematic use of minimum overlaps for ordinary topographic mapping by the OS has mostly been confined to the inter–war One–inch maps discussed here, and to the 1:250,000 mapping with its related road atlas developments produced since 1978. The extensive overlapping of some sheets in all the OS small–scale topographic series introduced from the mid–1920s onwards suggests that the argument that systematic overlapping on all sheets creates extra production work is as much a matter of the map producer hoping to blind the map–user with science, as of an argument which can be rigorously defended by practical example. (An interesting variation which may be noted appears on the maps of the Swiss Topographic Service, where a very small overlap – about 2 mm at 1:50,000 scale – is provided, enabling road junctions to be completed and dense contouring to be clarified.)

**The advent of the Fifth Edition ‘large sheets’**

For reasons which are outside the scope of this paper, but may be summarised as inadequate resources, the Fifth Edition made very slow progress. One sheet appeared in 1931, just before the national financial collapse, and four more appeared the next year. A leaflet in 1932 was rash enough to include a diagram of projected progress, culminating in complete cover of England and Wales by 1941, but that seems to have been arrived at by assuming that one–inch revision was carried out on a fifteen year cycle working from south to north (which was indeed the theory, though by 1931 it had already slipped somewhat), multiplying by (146 divided by 238), and adding that to 1931. That implied output of about 14 sheets per year. (Between 1924 and 1932 the Popular of Scotland had been published at a rate of 11 to 12 sheets a year; there was a higher proportion of sea area, and a much lower proportion of cultural detail to be revised and drawn, than in England and Wales.) Had publication of the Fifth Edition progressed as proposed, then changes to sheet lines in advance of publication might have been as limited as they were for the Popular of England and Wales and of Scotland, being confined to some minor adjustments along the coast. As it was, the leisurely rate of publication gave the opportunity to tinker more ambitiously. The first few sheets had adjoining sheet diagrams, but the early folded issues lacked the customary more extensive indexes on the back covers, suggesting that the initial sheet line layout was only settled in 1932. The earliest known printed index to the Fifth Edition probably dates from that year, and is distinguished by showing Sheet 34 as a portrait–shaped sheet, Sheets 96, 106, 107 and 108 as standard 50,000 by 30,000 yard sheets, Sheet 109 as 55,000 by 30,000 yards and Sheets 118 and 119 as 50,000 by 40,000 yard sheets. This index includes some sheet lines for southern Scotland, but excluding Scotland Sheet 90, and may never have been published.

8 Systematic overlaps were extensively used on 1:250,000 and smaller scale aeronautical mapping, where the imperatives of navigation presumably outweighed the extra production effort.


10 The only known copy is in Public Record Office (PRO) OS 1/312.
as the Fifth progressed. By 1936 the 146–sheet layout had been further modified, with Sheet 34 now a standard 50,000 by 30,000 yard landscape sheet (with a 30,000 yard overlap onto Sheet 33, which was a geographical improvement on the Popular Edition), Sheets 101, 102 and 109 now 50,000 by 40,000 yard sheets (with all but the bottom 10,000 yards of Sheet 109, which included a lot of sea, overlapping the other two), Sheet 110 45,000 by 50,000 yards, Sheet 111 60,000 by 35,000 yards and Sheet 120 50,000 yards square. (Fig. 5.)

By the time the index showing these changes had been printed, it had been overtaken by events. On 18 June 1935 – Waterloo Day – a decision was taken to review the sheet lines of the Fifth Edition, partly to expedite production (how, is unclear) and partly so as to eliminate some of the fifty–odd Tourist and District sheets complementing the Popular Editions. At the same time, the Davidson Committee was reviewing the state of the Ordnance Survey, and whilst it had been appointed earlier that year to investigate under–funding of the OS, the newly appointed Director–General OS, Brigadier M.N. MacLeod, saw it as a possible vehicle for other changes, including the adoption of metricalation. The review of sheet lines resulted in what has come to be known as the Fifth Edition ‘large sheet series’, characterised by sheets with a basic size of 60,000 or 65,000 yards west–east by 45,000 yards south–north (34.09 miles/inches (54.89 km) or 36.93 miles/inches (59.47 km) by 25.57 miles/inches (41.17 km) respectively), with once again an added overlap of 2000 yards where necessary. Sixteen such ‘large’ sheets were published between 1937 and 1939, covering south–central England, and sheet lines for some more were announced (Fig. 6). No index for a national layout of such sheets has been found, and there is some evidence that the published ‘large sheets’ were devised in at least two phases: the earliest known index, dateable to 1936, shows only eight sheets. It is possible that, because of the uncertainties as to what the Davidson Committee would recommend, only sufficient sheet lines were devised at any one time as were necessary for immediate drawing and publication purposes. Unlike the small sheet series, no evidence has been found of changes to published proposed sheet lines, though the more circumspect announcements of sheet lines limited the scope for such changes. Although the laying–out was within a framework of 22 rows of 45,000 yard sheets with no under– or overlapping between Portland Bill and Cape Wrath, and there is some evidence of similar considerations affecting the west–east layout, this may simply be relating the part to the whole, which is good survey practice. It will be seen that the rows of sheets were staggered, so as to reduce east–west overlapping. In many ways the new scheme was admirable, and something of the sort could have been adopted with advantage five or six years earlier, before any Fifth Edition mapping had been published. The one oddity was the numbering, which seems to have been prompted by a desire to retain separate numbering systems for England and Wales and Scotland, with the disadvantages of not knowing exactly what the ‘definitive’ number for each sheet would be, and of duplicating the numbers of some sheets already published. Indeed, two ‘large’ sheets, 95 and 114, which numerically duplicated two published ‘small’ sheets, were published as unnumbered ‘district’ sheets (St Albans and London respectively) with the intention of their being

11 Index to One–inch Fifth (Relief) Edition, with print code 10,000/36 in black: worn copies in Manchester Central Library (information from Richard Dean) and Royal Geographical Society.
12 Minutes of Director–General’s conference, PRO OS 1/96.

13 Copy in private collection, showing Sheets 111–2, 129–31 and 139–41. This, too, has a 10,000/36 print code, which refers to the black base–map with Fifth Edition ‘small’ sheet lines: unfortunately, the ‘New sheet lines’ were overprinted in red on both this and the later known (Manchester/RGS) state, and the red overprint carries no print– or date–code. Annotations on this ‘eight–sheet’ copy suggest that it was printed some time before the first ‘large’ sheet, 141, was published, in the first quarter of 1937.
14 By adding one 65,000–yard sheet to the west of Sheet 129, and two to the east of Sheet 132, north–west Devon to north–east Kent could have been fitted comfortably onto seven sheets.
numbered once the ‘small’ sheets had been wholly superseded by ‘large’ ones.\textsuperscript{15}

No such ‘large’ one–inch sheet lines were announced for south–west and south–east England, or indeed for the remainder of Britain: some ‘large’ sheets, e.g. 93–5, 111 and 114, correspond in cover fairly closely to earlier Popular Edition–based tourist and district mapping, and any conjectural completion of the Fifth Edition ‘large sheet series’ should bear this in mind. All the sheets announced were landscape–shaped, but portrait–shaped sheets could have been used with advantage in some places elsewhere, particularly where there was the possibility of effectively replacing a Popular–derived tourist or district sheet such as \textit{Liverpool}. Such a conjectural completion need not be a futile exercise: in 1935–6 three sets of half–inch ‘large sheet’ lines were devised for England and Wales.\textsuperscript{16} Each included some portrait–shaped sheets.

The ironic thing about the Fifth Edition large sheet series is that, in the early summer of 1937, after only two such sheets had actually been published, there were doubts about the advisability of such a large sheet size, and a new standard size of 55,000 yards west–east by 35,000 yards south–north (31.25 x 19.89 miles/inches; 50.32 x 32.03 km, 79.41 x 50.54 cm) was devised, and used for four further sheets, covering Essex and Kent, none of which were published, but which appear on contemporary indexes. (Fig. 7) These four intermediate–sized sheets do not make a very good junction with other Fifth Edition mapping and were probably a makeshift pending decision as to metrication and gridding by the Davidson Committee. Although no changes to published indexes were involved, I suspect that the original intention was that ‘large’ Sheet 132 was to have a 2000 yard overlap to the east (which the published sheet of 1939 does not, but which would enable two 65,000–yard sheets to carry cover east to the Kent coast), and that ‘large’

\begin{itemize}
\item Sheet 116 (60,000 by 45,000 yards) as shown on indexes of \textit{circa} 1937–8 was only devised to complete cover of Kent, rather than as part of systematic national cover by 60–65,000 by 45,000 yard sheets. (Sheet 134, which corresponds to the Popular–derived \textit{Hastings, Bexhill and Eastbourne} district map, might have been extended 5000 yards further east with advantage, to provide better cover around Rye.)
\item Even the 55,000 by 35,000 yard proposal was regarded as unsatisfactory by July 1937, and an internal memorandum suggested standard sizes of either 50,000 by 33,000 yards, or 45,000 by 30,000 metres: the first known suggestion of metrication of the One–inch Fifth Edition, as opposed to the more radical (and rejected) possibility of replacing it by a fully metric 1:50,000 map. These latest standard sizes were proposed as being suited to the capacity of the OS’s small rotary printing presses, which permitted a maximum paper dimension in the shorter direction of 23.5 inches (59.7 cm), and as suitable for the Bender fold.\textsuperscript{17}
\item In May 1937 it had been decided at a Director–General’s Conference that the maximum width for new sheets should be 38 inches (96.5 cm), and by August 1937 a new standard size had been evolved, which the record describes as ‘slightly larger than the old model’ (whatever that was) but which was ‘considered satisfactory’.\textsuperscript{18} As sheets in excess of 38 inches in width were successfully Bender–folded a couple of years later, this prejudice may have owed something to the awkwardness of the obsolescent concertina–folded sheets when fully open, particularly in confined spaces such as in a car.
\end{itemize}

\textsuperscript{15} See PRO OS 1/312.
\textsuperscript{16} And diagrams survive in PRO OS 1/351, including embodying a markedly different ‘solution’. Redrawn versions of the first and third were published in \textit{Sheetlines} 17 (1986), p.13.
\textsuperscript{17} Document 59A in PRO OS 1/351.
\textsuperscript{18} See DG’s conference minutes in PRO OS 1/96.
this is that this memorandum only survives as a carbon–copy in a file on the Half–inch map. Its interesting points are the possibility of metric sheet lines and of the Bender Fold, though, were a four–panel Bender for a sheet 23.5 inches high to be adopted, the result would be a very squat–looking folded map. On the other hand, sheets half again broad as they are tall come very close to the Golden Mean of 1.618 to 1, and it is unsurprising that, up to July 1937, small–scale proposals should have aspired to the Golden Mean. The next development was to break away from the Golden Mean.

The (nearly) square map

This imaginative leap had already been made for the larger scales. By the end of 1935 MacLeod’s thoughts were moving away from landscape–shaped evolutions from the imperial County Series towards a new departure for British mapping: the systematic use of square sheets. Square, or nearly square, sheets were common enough elsewhere, partly because of the extensive use of graticule–related sheet lines with numbering systems related to the 1:1 million International Map of the World, but were unusual in Britain; the OS restricted their use to tourist and district sheets, a few small–scale sheets of coastal areas, and specialised aviation maps. The only extensive use of the shape for a whole map series by a commercial publisher seems to have been by W. and A.K. Johnston for its three–mile (1:190,080) maps.19 At first, MacLeod thought that a 2–kilometre–square 1:2500 might be adopted, and perhaps a 5 by 5 kilometre 1:10,560 and a 10 by 10 kilometre 1:25,000. Decisions as to smaller scales would depend on how they were to be related to the larger scales. On the whole he favoured a range 1:62,500–125,000–250,000, but with sheet size equal to 2400 x 1600 metres at 1:2500: unless they adopted square maps at small scales as well as large. How would folding be affected?20

The vexed question of metrication of OS maps delayed the Final Report of the Davidson Committee, which was completed in February 1938 and published that November. The compromise was to adopt a metric grid, which was effectively the Transverse Mercator yard grid renumbered in metres, but not to adopt metric height values or any further ‘metric’ scales. Square sheets were duly adopted, with standards of 1 kilometre square at 1:2500, 5 kilometres square at 1:10,560 and 10 kilometres square at 1:25,000. The Davidson Committee recommended that the existing OS small scales be retained, but that the maps be published in alternative gridded and non–gridded forms.21 The Committee’s Final Report otherwise said nothing in particular about one–inch mapping, and certainly gave no hint that it, too, might appear in future in square sheets.

Precisely when MacLeod, or a subordinate, decided to essay square sheets for the small scales, is unclear, but it was certainly some time in the second half of 1937, by which time the Davidson Committee had probably accepted the basic principle of a national metric grid, but was still deliberating as to details. In November 1937 the Director–General’s conference of senior OS officers had before it two proposals for one–inch sheetlines, either for a sheet covering an area 40 kilometres square on the ground, or for one of 40 by 45 kilometres (24.85 inches/miles (63.14 cm) by 27.95 inches/miles (71.01 cm): mapped area 1800 sq km or 694.5 sq miles). It was thought the former ‘might make up a better index’ — which presumably means that the sheet lines cut through fewer important centres – but the latter would involve some twenty fewer sheets.22 Both were suitable for the Bender Fold, but – a point not mentioned in the official record – both were too big for the small rotary presses, as each involved a minimum dimension even within the neat lines, exclusive of any marginalia, of 24.85

19 Portrait–shaped sheets were also used by Johnston’s in the 1880s for their 1:84,480 map of Scotland, photographically pirated from the OS 1–inch, and by Gall and Inglis for their 1:126,720 Graded Road Maps of circa 1914. Neither series seems to have been completed, and both seem to have been short–lived.

20 MacLeod to E.O., 28 December 1935: minute 56 in PRO OS 1/84B.
22 PRO OS 1/96, 48A, 4 November 1937.
inches (63.14 cm). The proposals in 1935 for standard 2400 by 1600 metre 1:2500 sheets had implied a standard of 60 by 40 kilometres for the one–inch, which is very similar to the 65,000 by 45,000 yard standard of the Fifth Edition large sheets. There can be no doubt that by November 1937 MacLeod and his subordinates were seduced by square maps, and the fifth set of Fifth Edition sheet lines were only allowed to deviate slightly because of the charm of producing about twenty less sheets in the end, which complemented one argument for adopting a metric grid, that it would enable Britain to be covered with about 200,000 one–kilometre–square 1:2500 plans, as against about 240,000 thousand–yard–square plans. This, and the desire to keep the overall width to less than 38 inches, presumably outweighed the consideration that a 60–by–40 kilometre layout would have enabled national cover in about 135 to 140 sheets, with a conventional resemblance to the Golden Mean; however, a half–open Bender square or nearly square sheet would preserve an approximation to that Mean.

The ‘metric Fifth Edition’

Having decided that it liked 40 by 45 kilometre sheets laid out of the metric grid, the Ordnance Survey set about producing some. One of them actually got published: New Forest. Two others did not: one was ‘the Aldershot Command Sheet’, and the other ‘the North–West London Sheet’. Different production procedures were used for the three: New Forest was produced by the established method of re–photographing the original drawings, whereas the other two were produced by taking prints from Fifth Edition negatives and reassembling them on new sheet lines, using semi–experimental materials. The use of names rather than sheet numbers suggests that work was put in hand before the sheet lines and numbers for the whole country had been finalised, and indeed the sheet lines for Scotland were only approved in April 1938. The new sheet line layout allowed for twenty rows of sheets extending 45 kilometres south–north between Portland Bill and Cape Wrath, with no overlap, but the desirability of not splitting some important centres such as Leeds and Liverpool between sheets led to the insertion of an extra row of sheets and some consequent south–north overlapping. It will be seen from the index (Fig. 8) that there was no south–north overlapping of the southern five rows of sheets, but that there were several rows of west–east overlaps in southern England, and that the layout generally was characterised by butt–jointing rather than staggering sheet corners. It thus bears a stronger resemblance to the original layout of 1932 for the Fifth Edition small sheet series than to the layout used for the published Fifth Edition ‘large’ sheets. It will also be seen that the layout left some room for improvement, most notably in the division of Arran (published on a single one–inch sheet since 1906) between four sheets, and, more subtly, in the south–west of England. Though it gave the opportunity to make a clean break with the tangle of yard–grid sheet lines for the Fifth Edition, and produce a permanent solution to the question of Transverse Mercator one–inch sheet lines, one may suspect that they were in practice merely another phase of thought, and won the game of music chairs: a makeshift which became permanent for the remaining span of national One–inch cover. Some modifications (constrained by a general policy of not altering sheet lines) were made in about 1951–2 to the layout in Scotland, and a rearrangement of marginals enabled Sheets 138 and 151 to be combined in 1965. (Sheets 74 and 81 might have been treated likewise with advantage.) There is a contrast here with the Half–inch map, for which three sets of yard grid sheet lines were devised in 1935–6, followed in February 1938 by sheet lines in a standard size of 80 by 95 km (equal to 40 by 47.5 km at one–inch): as the half–inch was slow in coming, the metric sheet lines were subject

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23 Information from mimeographed OS research report, printed after 18 July 1938, but probably mostly written in about May–June 1938, pp. 42–3: the copy seen, in a private collection, unfortunately lacks the first sheet, thus precluding a better bibliographical citation. (I am greatly indebted to Tim Nicholson for drawing my attention to this.) The ‘Aldershot’ sheet is also mentioned in the OS annual report for 1938–9.

24 Minute 6, 20 April 1938, in PRO OS 1/375.

25 See minutes 182 and 183 in PRO OS 1/785.
considerable detail modification before the whole enterprise was abandoned in 1961, with only six of the fifty–one sheets printed.\textsuperscript{26}

The New Forest sheet is usually treated as part of the Fifth Edition rather than of any successor. Two sound reasons for this are that it carries the yard grid on its face, and that the sheet line diagram relates it to ‘the 5th Edition Series’. On the other hand, it is indisputable that its sheet lines are laid out on the metric grid, between 408 and 449 kilometres east, and 90 and 136 kilometres north, and that its bottom footnotes differ noticeably from earlier Fifth Edition mapping, but bear a much closer resemblance to the marginalia of published Fifth Edition–style mapping on metric grid sheet lines. Part of the explanation can be found in the working title being used in the spring of 1938 for New Forest and its two companion experimental sheets: ‘metric 5th Edition’.\textsuperscript{27} The Fifth Edition was not superseded: it was merely on its latest set of sheet lines, with some streamlining of the marginalia.

There are several interesting points about New Forest, which call for further comment. The first, and most obvious, is the paradox that this forward–looking map on metric grid sheet lines carries the backward–looking yard grid on its face. In fact, it was another makeshift. Had the Fifth Edition small sheet series not been abandoned, New Forest would never have been produced, as the area would have been effectively covered by Sheet 131, and the Popular–based tourist map, first published in 1921, would have needed no successor. An unfortunate by–product of the Fifth Edition large sheet series was that, in order to accommodate the Isle of Wight comfortably, and to fit into a coherent overall scheme, it was necessary to split the New Forest across three sheets, and a similar difficulty arose with 40 by 45 kilometre sheet lines, so a New Forest special sheet would have had to be produced regardless of which grid was adopted. As by the turn of 1937–8, when New Forest was presumably started, the future appeared to be metric, it was sensible to lay it out on metric rather than yard sheet lines. However, the Davidson Committee had not yet reported, and there was no formal ministerial authority to publish metric–gridded maps. Therefore, it was necessary publish both New Forest and any further new Fifth Edition sheets with the obsolescent yard grid. As all the drawing work hitherto had been laid out on the yard grid, and as yard grid sheet line diagrams had been published, publishing new sheets on the ‘large’ sheet lines three removes out of favour was an easy short–term strategy. Indeed, the last yard–gridded Fifth Edition, Sheet 93, Cotswolds, was only issued in the autumn of 1939, over eighteen months after Davidson reported.\textsuperscript{28} Like Sheet 94, issued a year or so earlier, the adjoining sheet diagram showed nothing to the north; the metric–gridded successor was casting its shadow before it.

A second interesting point is the layout of the bottom margin. By comparison with earlier Fifth Edition mapping it appears rather tightly packed. This was ‘streamlining’, exemplified by the magnetic variation diagrams tucked into the border, and indeed so streamlined was the map that the footnotes made no mention of the grid, which at first seems odd for a map created as a result of adopting the metric grid. In fact, the Davidson Committee was somewhat ambivalent about the grid, and fairly early in its proceedings, in 1936, the possibility of alternative gridded and non–gridded versions of the one–inch and smaller scales was aired. Whereas the large–scale maps would be gridded and the public could like it or lump it, there was a fear that, presented with a take–it–or–leave–it policy as regards issuing only gridded versions of the small–scale maps, they would leave it. Though MacLeod disliked the idea,\textsuperscript{29} the dual–format (gridded and non–gridded) publication proposal was formally embedded in the Davidson Committee’s Final Report, and the early Metric

\footnotesize{\textsuperscript{26} This counts Sheet 37, of which at least two full colour proofs survive, and Sheet 51, published as a ‘Provisional Edition’.

\textsuperscript{27} Strictly, the words used in the mimeographed research report of 1938 cited above are ‘Metric Sheetlines for the 1” 5th Edition Map’ (p.42).

\textsuperscript{28} And this would have not have been the last yard–gridded sheet, either: the 1:253,440 Forth Clyde and Tay in Roman Times, retaining the yard grid, was printed but not distributed in 1940. (Information from Roger Hellyer.)

\textsuperscript{29} Cf. DG’s conference, 11 March 1938, in PRO OS 1/96.}
Fifth Editions were
prepared in such a way that they could be issued in both gridded and non–gridded versions, with grid–working instructions printed inside the cover of folded copies. This was duly done with New Forest, where the instructions were for the obsolescent yard grid (called, for possibly the first and last time, ‘National Survey Grid’), but the principle is clear. (Incidentally, although the omission of grid–working instructions from flat copies seems somewhat eccentric to those used to subsequent OS one–inch and 1:50,000 mapping, it is worth bearing in mind that the great majority of 1:25,000 sheets published by the OS since 1948 have also omitted grid–working instructions, notwithstanding that until about 1985 the sheet numbering system depended wholly on the grid.)

**The evidence for New Popular overlapping**

The addition of an extra 2000 yards where necessary to the various standard sheet sizes for the published One–inch Fifth Edition, so as to maintain a minimum overlap, has already been referred to. The systematic minimum overlap principle was very useful for map users, but it was disliked by map–makers, including Winterbotham, and it was omitted from the Quarter–inch Fourth Edition of 1933–36. The metric Fifth Edition had a standard sheet size of 40 by 45 kilometres, and we have become so accustomed to this size, without overlaps, that it is easy to assume that it was intended thus from the beginning. Whilst there is no documentary proof that the metric Fifth Edition was originally intended to have systematic overlaps, there is strong circumstantial evidence of this.

1. *New Forest* does not cover 40 by 45 kilometres, but 41 by 46 kilometres.\(^{30}\)

2. The layout of the bottom margin is followed precisely by the succeeding New Popular Edition, as the Metric Fifth Edition was renamed sometime around mid–1938, right down to the price–note as originally printed. In fact, this price–range was incorrect for a district or tourist map, and all sales copies of *New Forest* had the correct price stuck over. (Figs 9 A,B,C.)

3. The working title ‘metric Fifth Edition’; this is perhaps the weakest argument, but it is balanced by:

4. The yard–based Fifth Edition had had a systematic overlap.

5. The size of the map frame.

6. The adoption of a standard sheet size enabling a standard border with marginalia to be drawn, in a single piece.

The substantial arguments against are:

1. The lack of documentary evidence either way for built–in overlapping.

2. The known antipathy of the OS to unnecessary overlaps.


4. *New Forest*’s status as a ‘special sheet’, which might be taken to imply non–standard treatment of its dimensions as well as of its colour–scheme.

5. The lack of any contemporary evidence for producing a standard pre–printed frame and marginalia.

6. The size of border used on various one–inch, half–inch and quarter–inch maps published from 1933 onwards, and adopted as standard for most new mapping from 1939.

I must emphasise that the width of the border is crucial here.

The arguments against may be disposed of as follows.

1. The lack of documentary evidence for overlapping on the one–inch also affects the half–inch and quarter–inch.

(2) and (3) The OS antipathy to the principle of overlapping is well–enough established, both in the documentary background and by the example of published maps, but against this must be put the fact that the metric sheet lines were merely another stage in the development of the Fifth Edition. In any case, both the Fourth Edition Quarter–inch and the basic 40 x 45 km New Popular Edition sheet lines included heavy overlapping of some sheets, in order to avoid splitting important districts or centres.

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\(^{30}\) It was the late Guy Messenger who first pointed out this difference between *New Forest* and the standard New Popular, in correspondence with the writer.
(4) Whilst New Forest was indeed a special sheet, it would have been possible to make it 40 by 45 kilometres with the assistance of extrusions, which were a characteristic not only of the published sheet, which has nine substantial extrusions to accommodate towns and road junctions (and another thirty–one lesser breaks to accommodate names or minor detail taken over from the constituent yard–gridded regular Fifth Edition), but also of other one–inch special sheets of the period. Further, of the three metric Fifth Editions in hand in May 1938, New Forest was treated as a standard sheet, a ‘control’, for comparison with the two other sheets, which were experimental.\[^{31}\] For New Forest to have followed a different specification, even if only in map area, would have reduced the comparative value of the experiment. The sole difference was in the additional colour, which was only definitely authorised on 28 May 1938.\[^{32}\]

(5) Use of standard elements as far as possible makes intuitive sense from a map production point of view, and is facilitated by standard sheet sizes.

(6) What I think is crucial is the hard evidence of the overall size of the map frame and the width of the border.

Fig. 10 shows four different borders: the standard yard Fifth, the metric Fifth, exemplified of necessity by New Forest, the standard pre–war broad border, used for non–overlapping maps such as the Quarter–inch Fourth Edition illustrated here, and the standard New Popular Edition border. At first sight there appears to be a straight left–right split. However, careful measurement\[^{33}\] shows that the Quarter–inch is the odd one out. The standard width of the border for the yard Fifth Edition and the first yard–gridded Half–inch district sheet, Cotswolds (1931–2), was about 0.59 inch (1.50 cm). For subsequent Half–inch specials, for the Oban and Cairngorms tourist sheets of 1936, for the Quarter–inch Fourth Edition, and for new mapping after 1939 a border 0.88 inch (2.24 cm) wide was used. The wider border was probably adopted to facilitate the multiple road distances and destinations which appear in the borders of these maps, and to leave more space for grid figures. The One–inch Fifth Edition used pre–printed borders in strips, containing the neatline and frame,\[^{34}\] to which marginal distances, grid and graticule were added prior to pinning–up for photography, and presumably the same principle applied to the other yard–gridded sheets. At first sight the New Popular border is 0.88–inch type, but careful measurement shows it to be 0.90–inch. Repeated careful measurement produces 0.90 inch for the production New Popular, and 0.88–inch for the earlier yard–gridded sheets. 0.90 makes no more sense in metric measurement – 2.29 cm – than it does in imperial. At the same time, New Forest has a 0.59–inch border. The apparently eccentric discrepancy is readily resolved when one calculates the frame size of New Forest and the production New Popular: in both cases it is 26.65 by 29.76 inches (67.72 x 75.62 cm). It is apparent that the frame and marginalia for the New Popular Edition are the same as for the metric Fifth Edition. When it came to assembling New Popular Edition sheets, the decision to dispense with the overlap resulted in a gain of the equivalent of half a kilometre all round, without the trouble of disturbing the bottom marginalia. What may have happened was that it was decided initially to increase the width of the border to 0.88–inch, and that it was then realised that this would involve increasing the overall dimensions of the map, and entail redrawing the standard border. The question would then be asked as to whether the overlap was really necessary, and it would be realised that the border could be widened by eliminating the overlap and so reducing the map area. Alternatively, it may have been decided first to dispense with the overlap, and so as to avoid

\[^{31}\] 1938 research bulletin, pp 42–3.  
\[^{32}\] Undated minute in PRO OS 1/375.  
\[^{33}\] Because of distortions inherent in photocopying, measurements from the ‘reproductions’ here may be at odds with the figures I give in the text. It is strongly urged that any remeasurement which may be necessary in criticising my argument be based on original maps, not on the illustrations.  
\[^{34}\] There is a surviving fragment of 1.19–inch pre–printed border on the reverse of document 83A in PRO OS 1/312, which was only recognised for what it is in May 1995.
rearranging the bottom footnotes the size of the map frame was left unaltered. There is no proof that this was what happened, but it seems logical.

So much for the direct evidence of metric Fifth Editions and early New Popular Editions. There remains some circumstantial evidence. The first is the tendency to extrusions around the coast and to cutting through important towns which could have been mitigated by a sheet size 1 kilometre larger. It could be argued that such extrusions were characteristic of the yard–based Fifth Edition, but it is remarkable that the tendency to extrude on the New Popular was greatly reduced as compared with the Fifth Edition: the average extrusion rate for the Fifth Edition is 0.0513 per kilometre of land sheet edge, and 0.0115 for the early New Popular sheets, a reduction to 22 per cent. Overall there was a considerable gain in the neatness of the margins. This reduction in extrusion appears to be deliberate policy: more detailed data is given in the Appendix below, and this does not suggest any great diminution in the tendency to extrude as publication of the Fifth Edition progressed. Rather, there is a clean break between Fifth and New Popular.

This leads to the question of how the New Popular sheet lines were devised. If the same procedure was followed for the New Popular as was followed for the projected metric–gridded Half–inch at this time, then the new sheet lines would have been worked out on an index covering the whole of Britain, at 1 to 2 million scale, printed but not published in 1937. The grid is laid down with sufficient accuracy to allow sheet positions to be judged to 1 kilometre, and it certainly indicates many of these extrusions and bisections of towns (see Appendix). Alternatively, a copy of the standard 1 to 1 million map overprinted with the grid may have been used, but the known contemporary procedure with devising new half–inch sheet lines makes me favour the 1 to 2 million index.

Related to this is the question of which grid lines to follow. Were the example of the yard–based Fifth Edition to be followed (laid out on 5000 or 10,000 yard grid lines) a basic size of 40 by 45 km implied following grid lines divisible by 5 or 10 into a whole number where possible, and so the sequence north from Portand Bill is 75, 120, 165, 210, 255, 300, 345 and 390 km etc North, and the sequence east from Wellingborough is 495, 535, 575, 615, 655 km East. However, a further division was desirable, which, if pursued with rigid logic, would have meant using 2.5 kilometre grid lines. In practice, whole kilometre grid lines were used, and thus going east from Ramsey Island we have the sequence 168, 208, 248, 288, 328, 368 km, rather than 167.5, 207.5, et cetera: i.e., the number is rounded up. There is an interesting exception to this in East Anglia, where there is a northward sequence 212, 257, 302, 347 km: i.e., rounded down. The point is illustrated by Sheet 137, which is asymmetrical south–north, being 3 kilometres out southward, and 2 kilometres out northwards. If it had been published as 41 by 46 kilometres it would have been symmetrical south–north (257, 303), and the protrusion to accommodate Lowestoft would have been much smaller.

The emergence of the New Popular Edition

It is unclear exactly when the decision to abandon the 1–kilometre overlaps was taken, but it was probably some time in the first half of 1938, after New Forest had been photographed, but before it had been published. By July 1938 the Metric Fifth Edition had been renamed the New Popular Edition, and about this time standard instructions for reconstituting yard–gridded Fifth Edition sheets as New Populars were issued, which clearly presuppose a standard

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35 As has Rob Wheeler, in correspondence with the writer.
36 Copies in PRO OS 1/351, which were used to plot sheet line proposals for the metric–gridded Half–inch map.
non–overlapping 40 by 45 kilometre sheet size.\textsuperscript{38} There is some advantage in calling the ‘overlap’ version the ‘Metric Fifth’ and the familiar ‘non–overlap’ the New Popular. ‘New Popular Edition’ appeared on the front of map covers, ‘New Popular One–inch Map’ in the heading, which was cropped from folded copies, and ‘6th Edition’ on map cover spines. ‘Sixth Edition’ was used internally by the OS, possibly because of the potential for confusion with the ‘old’ Popular Edition which had preceded the Fifth Edition. In view of the chopping and changing of Fifth Edition sheet lines, it was understandable that this latest set needed a distinct identity for sales purposes, and ‘New Popular Edition’ may have been devised to distract attention from the cuckoo in the nest, the grid, and focus it towards a supposed organic metamorphis from the ‘old’ Popular which still served most of Britain: but calling it ‘Sixth Edition’ as well, without including this in the maps’ heading, seems a needless confusion. The tendency for the larger scales had long been away from numbered editions towards first ‘Edition of’ and then ‘Revision of’ and one might ask whether the new metric one–inch need be known by anything more particular than ‘New Popular’.

Although proofs of New Populars 160 and 169 were printed by 3 May 1939,\textsuperscript{39} the first known surviving New Popular is a proof copy of Sheet 162, printed in or before July 1939, with Popular One–inch Map’, with no reference to ‘edition’, and the bottom margin layout follows outline, water and contours only.\textsuperscript{40} The heading is that of standard early New Populars, ‘New that of New Forest: the border is 0.90–inch wide. There are no grid lines on the map face, and the only grid figures in the margin are full co–ordinates at 5000 metre intervals, in similar style to the Fifth Edition. The implications of this for the method of grid referencing envisaged at this time were discussed in Sheetlines 43;\textsuperscript{41} here, it is only necessary to note that the decision, taken some time after the summer of 1939, to include grid working instructions entailed a further modification of the New Popular marginalia, by moving the scale bars to under the legend panels, and using the space thus created for the grid instructions. By this means only a small overall increase in the printed area of the map was entailed, and the greater width left more space for 1 km grid figures in the border. It was this modified style of border and grid which was used on the 27 New Populars known to have been printed or prepared before 1943, and which was perpetuated both when work on the New Popular resumed in 1943–44 and, in essentials, on the successor Seventh Edition, begun in 1947; on the latter, the width was slightly reduced, by simplifying the outer frame.

And thus the One–inch map lost its overlaps.

\textsuperscript{38} See printed instructions of September 1938 in ‘job file’ for New Popular Sheet 160 (in custody of Charles Close Society).
\textsuperscript{39} They are mentioned in early (spring 1939) minutes in PRO OS 1/219, but I have been unable to locate copies.
\textsuperscript{40} There are in fact two copies of the proof, both in PRO OS 1/374.

Appendix

Extrusions on One–inch Fifth Edition and early New Popular Edition mapping

The summary figures are: Fifth Edition (including all district sheets, except for New Forest): 6019.23 km of land sheet edge, 309 extrusions, i.e. 0.0513 per km; New Popular Edition (surviving sheets prepared before 1943 (see PRO OS 1/198), viz. 143, 145, 146, 149, 150, 157–62, 167–74, 177–80, 182–4): 3822 km, 44 extrusions, i.e. 0.0115 per km. It must be admitted that the Fifth Edition figures are somewhat inflated by the district sheets, with 0.197 km for St Albans and 0.187 km for London, but, even so, there is still a marked reduction on the early New Populars which are contemporary with, or immediately succeeding, the latest Fifths, and which, like Dartmoor, Exmoor, London and St Albans, were
made up from Fifth Edition sheets on which the name placing took no account of the change in sheet lines. The highest score of all is that of New Forest: 0.305, or about 2650 per cent greater than the numbered New Popular! (I have treated New Populards first prepared before 1943 as a direct continuation of the Fifth Edition; those prepared after 1943 have been excluded from consideration here, because of their ‘provisional’ nature, and because most were reconstituted from Popular Edition material.)

(1) Extrusions on Fifth Edition maps, by sheet number

<table>
<thead>
<tr>
<th>Sheet Number</th>
<th>1933</th>
<th>1934</th>
<th>1935</th>
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<th>1937</th>
<th>1938</th>
<th>1939</th>
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<tbody>
<tr>
<td>93, (1939)</td>
<td>218,000 yards (199-45 km), 2 extrusions: 0-010.</td>
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<td>94, (1938)</td>
<td>218,000 yards (199-45 km), 2 extrusions: 0-010.</td>
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<td>95, (1935)</td>
<td>164,000 yards (150-04 km), 2 extrusions: 0-013.</td>
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<td>[95] St Albans (1937/8): 228,000 yards (208-60 km), 41 extrusions: 0-197.</td>
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<tr>
<td>96, (1935)</td>
<td>188,000 yards (172-00 km), 7 extrusions: 0-041.</td>
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<tr>
<td>102, (1938)</td>
<td>188,000 yards (172-00 km), 6 extrusions: 0-035.</td>
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<td>106, (1935)</td>
<td>184,000 yards (168-34 km), 3 extrusions: 0-017.</td>
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<td>107, (1935)</td>
<td>188,000 yards (172-00 km), 17 extrusions: 0-099.</td>
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<td>108, (1936)</td>
<td>129,000 yards (118-02 km), 6 extrusions: 0-047.</td>
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<td>111, (1937)</td>
<td>185,000 yards (169-26 km), 8 extrusions: 0-047.</td>
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<td>112, (1938): 218,000 yards (199-45 km), 13 extrusions: 0-065.</td>
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<td>113, (1933): 168,000 yards (153-71 km), 7 extrusions: 0-045.</td>
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<td>113, (1939): 214,000 yards (195-75 km), 11 extrusions: 0-056.</td>
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<td>114, (1934): 164,000 yards (150-04 km), 4 extrusions: 0-027.</td>
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<tr>
<td>115, (1934): 168,000 yards (153-71 km), 5 extrusions: 0-032.</td>
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<tr>
<td>118, (1933): 88,000 yards (80-51 km), 2 extrusions: 0-025.</td>
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<td>123, (1933): 168,000 yards (153-71 km), 5 extrusions: 0-032.</td>
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<tr>
<td>124, (1934): 164,000 yards (150-04 km), 4 extrusions: 0-026.</td>
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<tr>
<td>125, (1936): 168,000 yards (153-71 km), 7 extrusions: 0-045.</td>
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<td>127, (1933): 106,000 yards (96-98 km), 2 extrusions: 0-021.</td>
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<tr>
<td>128, (1933): 164,000 yards (150-04 km), 5 extrusions: 0-033.</td>
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<td>129, (1937): 174,000 yards (159-19 km), 4 extrusions: 0-025.</td>
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<td>131, (1937): 218,000 yards (199-45 km), 6 extrusions: 0-030.</td>
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<td>132, (1939): 220,000 yards (201-28 km), 9 extrusions: 0-045.</td>
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<td>136, (1934): 95,000 yards (86-92 km), 5 extrusions: 0-057.</td>
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<td>137, (1932): 184,000 yards (168-34 km), 2 extrusions: 0-012.</td>
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<td>138, (1933): 149,000 yards (136-32 km), 3 extrusions: 0-022.</td>
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<td>139, (1937): 150,000 yards (137-24 km), 2 extrusions: 0-015.</td>
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<tr>
<td>140, (1937): 128,000 yards (117-11 km), 7 extrusions: 0-059.</td>
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<td>142, (1939): 139,000 yards (127-17 km), 8 extrusions: 0-063.</td>
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<td>143, (1934): 93,000 yards (85-09 km), 6 extrusions: 0-070.</td>
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<tr>
<td>144, (1931): 116,000 yards (106-13 km), 3 extrusions: 0-028.</td>
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<tr>
<td>145, (1932): 66,000 yards (60-38 km), 4 extrusions: 0-067.</td>
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<tr>
<td>146, (1934): 38,000 yards (34-77 km), 3 extrusions: 0-086.</td>
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</table>

Aldershot (North), (1932): 160,000 yards (146-39km) 5 extrusions: 0-034.
Aldershot (South), (1932): 160,000 yards (146-39km) 5 extrusions: 0-034.
(2) Extrusions on Fifth Edition maps, by date

<table>
<thead>
<tr>
<th>Year</th>
<th>Map</th>
<th>Extrusion</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
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</tr>
<tr>
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<td><em>Aldershot (South)</em></td>
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<tr>
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(3) Extrusions on Fifth Edition maps, by decreasing extrusion

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<td>1937</td>
<td>[114] <em>London</em></td>
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<td>0.010</td>
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<td>114</td>
<td>0.027</td>
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<td>1934</td>
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</tr>
<tr>
<td>1934</td>
<td>136</td>
<td>0.057</td>
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<tr>
<td>1934</td>
<td>115</td>
<td>0.032</td>
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<td>146</td>
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<tr>
<td>1934</td>
<td>102</td>
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</tr>
<tr>
<td>1932</td>
<td><em>Aldershot (North)</em></td>
<td>0.034</td>
</tr>
</tbody>
</table>

*Aldershot (North),* (1932): 0.034.

*Aldershot (South),* (1932): 0.034.
(4) Extrusions on early New Popular Edition (by sheet number)

143, 170 km, 3 extrusions
145, 170 km, 6 extrusions
146, 170 km, 1 extrusion
149, 164 km, 2 extrusions.
150, 82 km, 1 extrusion.
157, 170 km, nil.
158, 170 km, 2 extrusions.
159, 170 km, 1 extrusion.
160, 170 km, nil.
161, 169 km, nil.
162, 93 km, 1 extrusion.
167, 170 km, nil.
168, 170 km, nil.
169, 170 km, 2 extrusions.
170, 170 km, 1 extrusion.
171, 165 km, 2 extrusions.
172, 127 km, 6 extrusions.
173, 53 km, 5 extrusions.
174, 78 km, 1 extrusion.
177, 132 km, 1 extrusion.
178, 127 km [including inset], 2 extrusions.
179, 110 km, nil.
180, 92 km, 1 extrusion.
182, 133 km, 1 extrusion.
183, 107 km, 3 extrusions.
184, 106 km, 1 extrusion.

(5) New Popular Edition: ‘tight spots’

63  North Berwick extruded: much easier fit if extended 1 km N.
78  slight coast extrusion in SE: would not show up on 1:2M index.
85  east part of Hartlepool extruded, by about 000–500 metres.
94  1.1 km extrusion on W to fit in foreshore off Blackpool.
99  about 600 metre extrusion in SE corner for coast.
100, 109 these sheets include the west part of Warrington: more serious is a 1.5 km extrusion for Hilbre Island.
102/103/111 Sheffield is at the junction of these three.
105 1 km + extrusion in SE for coast.
108  Point of Air extrudes about 1.25 km.
112/113 Newark: completely straddled.
119/120/130 Bloxwich and northern part of Walsall: straddle sheet lines.
120/131 north Walsall: straddles sheet lines.
122/133 Uppingham: straddles sheet lines, but not very important.
123/134 Peterborough: 1 km overlap 300/301 and a further 0.3 km extrusion in border would enable practically whole of the 1938 built-up area to be included.
124 6 km long extrusion in NE for coast: up to 1 km extruded.
125 6 km long in N for coast: up to 0.5 km extruded.
125/136 1 km overlap would accommodate north Wymondham on 136.
130/143 Worcester: similar case to Peterborough.
131/144 Stratford on Avon: completely straddled.
131/132 Warwick: west part is on 131. 1 km overlap west would solve this.
133/134 Rushden: straddles sheet lines (not very important: extends nearly to 497).
137  about 0.6 km (and more for name) in NE for Lowestoft, where the name breaks the frame.
137/150 Aldeburgh: straddles sheet lines (not important).
138/151 both about 2.5 km W for Bishops and Clerks, perhaps better handled as an inset.
139  over 1 km in NE for coast.
140/141 Llanrhydyr Wells: straddles sheet lines (not important).
141/154 Ebbw Vale, etc.: straddle sheet lines.
145/158 northern part of Oxford extruded: 1 km completely clears built-up area and by-pass (A40).
156/166 Bath: 1 km overlap within neat line would include practically all the built-up part on Sheet 166.
189/190 Redruth: straddles sheet lines (not very important).
Ordnance Survey in television, books and films

There have been a number of references to, and uses of, Ordnance Survey maps in television programmes, books and films. The following are probably only the tip of an iceberg.

**OS references on television:**

a. “Hollyoaks”;
   This new Channel 4 ‘soap’ uses part of a modified large scale map of Chester under its title sequence.

b. “Tracks”;
   The title sequence of this BBC series (now finished) showed somebody studying a Landranger map of the Abergele area in North Wales (i.e. sheet 116). The map was then seen being folded into a distinctly non-standard OS cover before it was pushed into a rucksack.

   The cover was obviously based on the current Landranger one, but the block above the photograph was green instead of magenta. ‘Ordnance Survey’ still appeared top left and the OS logo in a white box top right. Details of the scale appeared immediately above the photograph, as usual, but all the other wording (i.e. Sheet Title, Landranger, etc.) in the middle was replaced by the programme title, “tracks” (sic) appearing in blue letters on a yellow ground inside a large diamond shape outlined in blue.

   I wonder who was responsible for this creation — presumably not the Ordnance Survey.

**OS references in books:**

There are some references to OS maps in Conan Doyle’s Sherlock Holmes stories. For example, in the short story *The Engineer’s Thumb*:

‘Bradsheet had spread an ordnance map of the country out upon the seat, and was busy with his compasses drawing a circle with Eyford for its centre.’

And again in *The Priory School*:

‘He (Holmes) had obtained a large ordnance map of the neighbourhood, and this he brought into my room, where he laid it on the bed. ...“Look at this map. ...On the south of the house is, as you perceive, a large district of arable land, cut up into small fields, with stone walls between them. ...We turn to the country to the north. Here there lies a grove of trees,... and on the farther side a great rolling moor... extending for ten miles and sloping gradually upwards. ...There is a church there, you see, a few cottages, and an inn. Beyond that the hills become precipitous.”’

   Obviously Holmes was quite accomplished at map interpretation! Presumably these references are to One–inch maps, but I’m uncertain of the dates of first publication of these particular stories, so cannot be sure of the edition. They could be anything from Old Series to Popular because the stories appeared between 1892 and 1925.

**OS references in films:**

a. “Shadowlands” UK, 1993:
   A One–inch Popular is seen being used by Joy Gresham and Jack Lewis whilst on a motor excursion to the Golden Valley, Herefordshire, in the 1950s!

b. “The Englishman who went up a hill but came down a mountain”, UK, 1995
   In 1917 two Englishmen, Reginald Anson (Hugh Grant) and George Garrad (Ian McNeice), working for H.M. Ordnance Survey arrive in the village of Ffynnon Garw, South Wales, in order to measure the height of the local vantage point — claimed to be the first mountain in Wales. Accurate measurement from the surrounding mountains (hills?) using a transit puts it at 984 feet, 16 feet short of the 1000 feet required to qualify as a mountain.

   Various plots are hatched to detain the Englishmen until the local villagers have endeavoured to add an extra 20 feet to the hill and, therefore, raised it to the official status of a mountain.

   Close–ups of several Six–inch (?) maps are seen during the film. Presumably these were specially created. Does anyone know if there is any truth or historical accuracy in this story? The two surveyors appeared to be on an extended
visit to the Welsh borders measuring heights of hills. Is this likely to have taken place at that time, 1917? Would two surveyors have been able to perform this task unaided?

Unfortunately, the night I saw this film, I think that the projectionist was anxious to get home because the curtains were closed before the credits had ended. Consequently I was unable to read the final acknowledgements and therefore do not know who advised on the details of OS practice. Do we know?

There is an additional television reference, probably from about a year ago, but I do not recall the details; I think it might have been *Spitting Image*. The item challenged the statement that Ordnance Survey maps are the most accurate maps in the world by drawing attention to the fact that certain conspicuous, and presumably sensitive, government establishments do not appear at all. An example was given of one on the outskirts of Reading, I think, which is totally absent from the relevant Landranger. I’m sure that someone will remember.

*Mike Meredith*

**Use of Grid References**

Members may be aware that the plot of the episode of *Dad's Army* (re-re-re-telecast on BBC1 on 28 October, 1995, hinged round a bungled (north before east) grid reference. Does any reader know of any other fictional or dramatic use of grid references? (Fiction accompanied by maps of various degrees of quality is common enough, and textual references to OS maps not unknown, but grid references?!)  

*Richard Oliver*

*And for real ..it just sounds like serial plot*

Interesting correspondence has appeared recently in *The Job*, the staff newspaper of the Metropolitan Police. On 18th August a letter was published from Sergeant *R*, complaining of a recent instruction that the locations of stolen and found vehicles must be accompanied by the postcode when reported to the Police National Computer, and that, if necessary, postcodes should be ascertained by knocking on doors, or, for vehicles found in supermarket car–parks, by phoning the supermarket to discover the postcode. Sgt R pointed out that OS grid references could be used equally well. Accompanying this letter was a response from Detective Chief Inspector *L*, saying that there was now the capability for analysing vehicle theft, and defending analysis by postcodes on the grounds that the spatial analysis element in the PNC was being provided *gratis* by an outside body, which only had the capability to analyse by postcode. On 15th September a letter was published from Sergeant *D*, observing that he read the earlier correspondence ‘with anger and sadness but no surprise’, attacking ‘inappropriate and inept technological choices’, pointing out that postcodes are liable to change (he might have instanced SO9 4DH becoming SO16 4GU) and remarking that ‘There is only one satisfactory way to describe any location and that is by using the Ordnance Survey grid reference.... Management... is failing to think things out properly.’ On 29th September *The Job* reported that the OS Address-Point database had been acquired, enabling grid references and postcodes to be matched.

*George Jasieniecki*
Rural Ride

Adam Nicholson

This is an extract from one of a series of articles by Adam Nicholson published in the Sunday Telegraph Magazine, in which he refers to the on–going rebuilding of his farmhouse, Perch Hill Farm. Visiting the University Library, Cambridge.....

‘...Last week I saw a picture of what this place might one day be. ....

Falling asleep over what I was meant to be reading, I decided to see if Perch Hill Farm featured in the world mind. There was nothing in the computer catalogue, but that was probably too much to expect, so I went to the Map Room. Here, on giant green tables, a serious man, writing the history of Bechuanaland in the late 1890s, leans over garish maps of mineral deposits and catchment areas; a woman in an Inca–style cardigan is analysing the hydrography of Scapa Flow; I ask for Perch Hill Farm. “Certainly,” the map librarian says. “Just fill in the form.” She disappears for a minute or two while I kick my heels and she returns with one heavily and precisely folded piece of paper.

She leaves me to it and carefully I unfold the sheet. It is large, perhaps three feet by two, and has a clean and precise air to it, as if freshly laundered. There is even a smell, in its inner sections, of newness and ink. But it is far from new. This map is part of the great 25 inches to the mile series made in the second half of the 19th century. This particular sheet was produced in 1898. I don’t think anyone has looked at it since it was made.

At my own giant green table, I pore over the map of home. The farm just about fills the sheet. The other people may be thinking about, analysing, or drawing conclusions from the maps in front of them. I’m not. I’m in bed with my map, loving every inch of it, drinking it up, reading the reality of hedge–bend, gateway, wood–corner and stream–turn, surveyed so exactly, drawn so carefully. This map series, which marks individual trees in hedges and names every field, which if laid out for the whole country would stretch 200 yards from the Lizard to the Cheviots, scarcely less from Southwold to St David’s, is probably the greatest map ever made.

I look at my sheet, one tessera of a stadium–size mosaic, and in it see the state of perfection, described in a fortnight’s work in the spring of 1898; the hop garden in Hollow Flemings, no longer there; the small wood that cuts in two the big field known as Great Flemings, no longer there; the three hedges that make small compartments of the other big hay meadow, the Way Field, none of them now there; the little wood dividing Target from Cottage Field, marked now only by a bank and a single oak; the orchard in the Cottage Field, of which one fruitless plum tree remains. Here, in the Map Room, surrounded by the nearly audible sound of the collective Cambridge brain ticking, I see something else; our farm in its rich, divided wholeness, the picture a century ago......’

Ordnance Survey Maps in the Red Guides...

Ian O’Brien

One of the longest running and most widely distributed series of local guidebooks was Ward Lock’s “Illustrated Guide Books” in the ubiquitous red covers. The series was notable for the consistency with which the publishers maintained the same format over many decades, though in later years some concessions were made to modernity such as the substitution of bleeding edges for the generous white margins to the plates. Over most of this time Ward Lock remained faithful to John Bartholomew as a source for the folding maps bound into these books, but for a short period in the 1930s their loyalty waivered.

In the 1935–36 issue of Portsmouth and Southsea the two general maps, one of the hinterland, one of the Isle of Wight, are both unlayered (and unshaded) extracts from the Ordnance Survey Half–inch, though the street plan and the chart of the Solent are both Bartholomew. South Wales, 1937–38, contains four OS Quarter–inch (unlayered) extracts, but the town plans and a half–inch map of the Gower Peninsular were supplied by Bartholomew. Falmouth, 1935–36, uses an extract from Sheet 2 of the Ten Mile road map to provide general cover of the South West, while part of the Fifth (Relief) One–inch sheet 146 offers more detail for the Lizard Peninsular. Bartholomew is retained for the half inch mapping of “Mid Cornwall”. In Torquay, 1937–38, on the other hand, the half inch map is from OS, while a Bartholomew ten mile is used as its “Touring Map of Devon and Cornwall”. All the Ordnance Survey maps mentioned bear the imprint CR 5210, but print runs vary.

Ward Lock seem to have had no obvious policy in their choice of maps. Did they commission these extracts from Ordnance Survey as a means of exerting pressure on their regular supplier? All post-war editions that I have seen are exclusively mapped by Bartholomew.

... and in the Homeland Handbooks

Lionel Hooper

I have only one of the series of the Homeland Handbooks published from the turn of the century, No. 30, Littlehampton & Arundel and their Surroundings; it is one of some 55 publications, although ‘...Handbooks for many other Towns and Districts are in active preparation’. (Second Edition 1907, but there is a pasted insert — presumably printed in 1917 — saying that as from 1st January, 1918, the prices will be increased, from 7d to 9d, and 1/- to 1/6 for the cloth bound edition.)

The interesting point about this particular series of publications is that many —39 out of 55—are listed as including ‘Ordnance Map’; the others just shown as having ‘Map’. Comparison of the map in my Handbook with the One–inch Third Edition, 136, Arundel, shows that it is indeed a copy of that map, printed with full detail, but only in black. Because Littlehampton is on the south coast, the town is placed horizontally central but 2 inches above the bottom sheetline, thus enabling the coast towards Bognor to be included. The map measures some 12⅞ by 9 inches, and as can be seen from the accompanying illustration, it also includes distance circles at one mile intervals around Littlehampton Station. The map was ‘Printed by THE HOMELAND ASSOCIATION, [address], for insertion in “THE HOMELAND HANDBOOK FOR LITTLEHAMPTON”’

Did the Homeland Association use only Third Edition maps? Were they all One–inch?
## New maps

**Ordnance Survey of Great Britain**

New publications between 1 May and 30 September 1995 included:

### Conventional paper maps:

1:50,000 *Landranger* (2nd Series):

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<tbody>
<tr>
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<td>4, B</td>
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<td>11, B</td>
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<td>35, A4</td>
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<td>71, A3</td>
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<td>137, A1</td>
<td>(5/95)</td>
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<td>149, A3</td>
<td>(5/95, repeated [in fact A3/] 8/95)</td>
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<td>176, C2</td>
<td>(9/95)</td>
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1:25,000 *Explorer* (2nd Series):

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<tbody>
<tr>
<td>6</td>
<td>Cannock Chase (7/95)</td>
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1:25,000 *Outdoor Leisure Maps* (2nd Series):

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<tr>
<td>16</td>
<td>South Devon - West/East, A (9/95)</td>
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<tr>
<td>33</td>
<td>St Bees Head to Keld, B, (5/95)</td>
</tr>
<tr>
<td>34</td>
<td>Keld to Robin Hood’s Bay, B (5/95)</td>
</tr>
<tr>
<td>37</td>
<td>Isle of Arran, A (8/95).</td>
</tr>
</tbody>
</table>

Four further sheets are announced for publication in November (all back-to-back):

16, *Cheviot Hills* 19, *Howgill Fells* 35, *North Pembrokeshire* 36, *South Pembrokeshire*. No doubt the constituent *Pathfinders* will be withdrawn (as, presumably, will be 1362 (SX 54/64), which was publicised as ‘the last Pathfinder’ on its appearance in late 1989, but which falls wholly inside the new extended South Devon sheet), but as none of the four are shown on the January 1995 edition of the index to 1:25,000 and 1:50,000 mapping, we are unable to say which Pathfinders are ‘for the chop’.

**Ordnance Survey of Ireland**

The following 1:50,000 *Discovery* series sheets have recently been published:


The only design change noted is the addition of a sheet title, *Dublin City and District*, on the cover of Sheet 50. (The ‘primary/secondary’ confusion in the legend now seems to have been sorted out.)

**The Godfrey Edition**

Between 20 July 1995 and 3 November 1995 coverage was extended to the following places:

<table>
<thead>
<tr>
<th>Place</th>
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</thead>
<tbody>
<tr>
<td>Bath</td>
<td>Newtownards (Co. Down)</td>
</tr>
<tr>
<td>Consett</td>
<td>Oakengates</td>
</tr>
<tr>
<td>Deal</td>
<td>Queensferry &amp; Dalmeny</td>
</tr>
<tr>
<td>Donaghdee (Co. Down)</td>
<td>(Linlithgowshire)</td>
</tr>
<tr>
<td>Jedburgh</td>
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</tr>
<tr>
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<td>Whitby</td>
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<tr>
<td>Richard Oliver</td>
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*Richard Oliver*

Having recently purchased a copy of the book at a cost much greater than the original 6/-, he found it extremely easy to read, and asks if the book was the first time a history of the Ordnance Survey, etc., was published for the ‘popular’ market?
Landranger Sheet 124 Dolgellau and surrounding area

David Watt

During 1993–4 Ordnance Survey embarked on a programme to gauge the views of users on Ordnance Survey maps and products. This was the “Cartographic Concepts Study”. The Charles Close Society was invited to comment, as were many other interested parties including other members of OS consultative committees, corporate and military users, pressure groups and private individuals. (The CCS were not able to respond representing the collective view of the society in the short time available, although some members sent private submissions.) The study, which led to a strategic decision ‘to include information on access to the environment’¹ is now at an end. Its detailed points for consideration for the Landranger series included a better depiction of accessibility to the countryside using ‘white roads’, information on ‘access to land’, Forest Enterprise land and recreation facilities, cycle routes, disabled facilities, local tourist information, recreational access to water and, last but not least, hill shading. An experimental sheet was to appear in Spring 1995 and Landranger Sheet 124² was the result, printed in June 1995. As the questionnaire in the first 4,500 copies states:

This version ... is a special edition published to assess customer reaction to several new features that could be added to the Landranger Map Series.

That there has been public reaction there is little doubt, but more of this anon.

Outwardly, the only sign that the sheet might be slightly different from the norm is the physical weight and bulk of the folded sheet which, when compared with another sheet in the series, seems slightly heavier and thicker. The cover is the usual photographic type, although the photograph has been changed to one of “Llynnau Cregennen beneath Calder Idris”, but still carries the Welsh flag, a small version on the spine of the cover and a larger one impinging on the photograph. (Despite this, your reviewer still did not pay any attention as he thought that it was simply a method to publicise Welsh sheets, so did not at first purchase a copy.)

Suspicion is increased when the folded map is opened, for instead of seeing the usual legend information, one is confronted with the bottom half of the legend inverted. This gives the impression that the map has been stuck to the cover backwards (a rare example of OS allowing a mistake to get to the point of sale, I thought) but all this is a prelude to the sheet being opened out completely.

Only when the map is fully opened out does the reason for the extra weight and legend inversion become apparent. On the right we have the usual English legend, but on the left, and utilising an extra Benderfold, is the legend entirely in Welsh. When fully opened out the effect is one of pleasing balance; such a pity that on the way the user is confronted with inverted type.

Visually, the most striking departure from the usual product is the addition of “shaded relief”. (Sheets 90 and 160 have also been shaded, but only as in–house experiments, not on public sale, although sheet 90 was made available for consultation). The shading has been added as a screened image on the black plate and consists of two distinct elements, the first being relatively light black dot for relatively shallow gradients, whilst steeper gradients are denoted by a heavier dot although using the same screen.

The component has been produced by inputting the OS 1:50,000 Digital Elevation Model (DEM) into the proprietary “SLOPES” Laserscan modelling package, part of the “LAMPS” cartographic suite. The method of shading is cartographically interesting, indeed extremely unusual, in that it employs light sources from both the north–westerly and north–easterly quadrants with no editing nor deselection.

In small areas this has led to some interesting results in that, because the resolution of the screen used is relatively low, the hill

² 1:50,000 Landranger Sheet 124 Dolgellau and surrounding area, Edition A2 (Series M726 edition 4–GSGS)
shading has in some cases straight line edges. The component might have benefited from a finer resolution bi-angle screen to combat this effect and, also on the micro-scale, it is unclear what the criteria are for employing the heavier dots, as some arbitrary areas carry the stronger colour.

The general effect is best summed up by a colleague who, after looking at the map for five minutes or so, said “[The shading should] ...enhance the user’s appreciation of the landscape. This does not.”

The problem seems to stem from the fact that the human eye is accustomed to shading with a light source from the north–west, no matter how perverse that may be to people used to the sun shining from the south. Experiments have been done with the light from the south but the result is that the mountains appear as craters and rivers as flattened ridges between them. Almost all classic hill–shading employs the north–west point of illumination, but this product in using two quadrants confuses the viewer. The instantaneous 3–D effect of, say, a Swiss 1:25,000 does not happen. Initially I looked at the sheet until I got a headache, trying to make sense of the topography. One area (illustrated at fig. 1) even looks as though it has hill shading all round, implying not oblique but vertical illumination, a method dismissed by an exponent of relief presentation, Dr Eduard Imhof.

The source of the data from which the shading has been derived may also be queried, although my grounds for so doing are with the benefit of sight of sheet 160 and not 124. Sheet 160 carries open–cast coal sites, areas where no contours occur, yet there appears in them areas of hill–shading. It can therefore be concluded that the relief data in the DEM is not necessarily the same as appears on the paper 1:50,000 map, and the DEM may or may not be corrected before a new edition of the Landranger appears, an error which seeks attention in my view.

The “jury is out” on the shading overall. Military users disliked the shading because it created landscape interpretation difficulties when used on exercises. Feed back from walkers known to members of the Society point to confusion and complaints about poor legibility of detail in steeply sloped, wooded areas. I leave you to draw your own conclusions.

Finally on the subject of relief, the contouring remains as on the previous edition, but the spot heights have been revised and many new heights added. These differences can be spotted as the amended/new heights appear in slightly heavier type than those which remain from the previous edition. (This phenomenon in fact goes for all new type on the sheet, and can lead to an odd juxtaposition of heavy and light type for the same class of feature, notably similar sized lakes [fig. 2] and habitations.) Surprisingly, OS advised that amendments to spot heights were carried out by ‘field revisers’, although the more cost effective method would surely have been either to derive them from the DEM, or recalculate them from aerial photography.

Moving on, I turn to the second major departure from tradition on the map face of 124, and the one which has caused the most commotion in the national press, namely the depiction of selected off–road cycle routes and
The so-called ‘secret routes’, or as the OS put it, ‘Other routes with public access’.

The cycle routes are depicted using screened orange dots which for the most part follow the black pecked lines of unfenced other roads, drives or tracks. The symbols seem only to appear in the Coed-y-Brenin Forest and along the Penmaenpool–Morfa Mawddach Walk (fig. 3).

The cyclists and the locals appear to be satisfied with this depiction the same could not be said about the routes open to public access. These are shown as a magenta open diamond symbol and cover the whole of the map sheet, as shown in fig. 1. Cartographically, one problem is that it is unclear where the publicly accessible route ends. Is it at the end of the final diamond, or mid-way between the last diamond and where the next diamond would have been if the route continued; it is not clear from many examples on the map. In the real world, the arguments have centred around what form of public access is allowed on all or part of any track. The OS did not specify the precise nature of access because in many instances this is open to dispute but landowners, farmers, ramblers, etc. fear that 4-wheel drive enthusiasts will take their cue from the map and start driving along the routes, thus depriving walkers and the like of a peaceful by-way. In a piece headlined New maps reveal ‘secret routes’ in The Daily Telegraph\(^3\), the OS Publications Manager said in his employer’s defence that:

‘We accept that this has caused confusion and now we intend to carry additional information in the key to the maps. This will state that the diamond symbol indicates that there is only public access and that members of the public must contact the local highways authority in the area to find out who is entitled to use the track.’

Quite whether a determined ‘off-roader’ is going to check the uses of a route before using it maybe open to question, and meanwhile local park rangers have been concerned that the map information was being used by ‘off-roaders’ to ignore signs forbidding them access on the ground. The Ramblers Association were at the same time delighted at the prospect of safely using ‘white roads’ which they previously thought were not rights of way. The map states that the bicycle and other route information has been supplied by the local authorities and it is to be hoped that, following the vociferous reaction by some of the inhabitants of the area, local authorities do not decline to give the necessary information to the OS in future for fear of local adverse reaction.

The inclusion of the Welsh legend might suggest that this sheet could be completely utilised by Welsh speakers. However, should they venture across to Ynys Gifftan they will be

\(^3\) _Daily Telegraph_, p 12, 10th October, 1995
unable to decipher the warning notice on the map, given only in English, of tidal conditions

Lastly, your reviewer also became confused when looking at what was formerly Forestry Commission but are now, Forestry Enterprise boundaries, picked out in line which is a mix of cyan and magenta screens, giving a rather nice purple hue. In many instances the boundary symbol runs parallel to, but up to 0.7mm (about 50 ft on the ground) outside the fenced boundary of the forest. (fig. 4) Does Forestry Enterprise only plant up to 50ft from their boundary, or have the OS adopted this solution to running a coloured boundary along a solid black line? As it stands, the purple line is just far enough away from the obvious forest boundary to cast doubt in the user’s mind, but were the line to be positioned closer to the fenced boundary this, I think, would be a lot more satisfactory.

To conclude, there is little doubt that the OS should be commended, firstly for having the courage to ask its users what they thought of the OS product, but, more importantly, to take the bull by the horns and actually make a product for public sale, and then ask the public what they think of it. Cartographically, the main cry was obviously for hill–shading and the OS have no doubt done the best they could with what was to hand. Using two aspects opposed to each other at 90° to create hill–shading using the classic north–west source of illumination can be successful and collaboration by the OS with other agencies might prove fruitful. However, even the most delicate of hill–shading may still cause problems of legibility in areas of high relief for the fundamental problem is surely that the current Landranger specification was not designed to carry hill–shading. Much as the unshaded version of the Swiss 1:50,000 looks strangely “white” and devoid of detail, so this hill–shaded Landranger looks “heavy” with detail. Hill–shading is undoubtedly one of the most successful methods of giving an instant impression of relief, but only when generated successfully. Currently this is not a good example and, before it is successful, both the technicalities of the digital production of shading and the overall Landranger specification will need work. The route information, once clarified, will be immensely useful to all those who actively use the outdoors and its inclusion on an all purpose map is to be commended.

Go out and use it, see what you think of it, and then use your questionnaire to tell the Ordnance Survey. They will be delighted to hear from you, and you will be doing yourself and your national mapping agency a service.

Acknowledgements:
I am grateful to the MoD Map Library, Tolworth for sight of Experimental Landranger sheet 160, Dr C Board for sight of sheet 90 and feed back from hikers, Messrs J Rollin and W Debeugney (Ordnance Survey) for information freely given on the circumstances behind the production and the production techniques used in the making of these experimental sheets, and Mrs E. Manterfield (Mil Svy) for advice on information sources.

Bibliography:
Meetings

Map Cleaning and Repair Workshop, 16 September 1995

The Map Cleaning and Repair workshop was held at the Westlands High School, Congleton, and led by Graham Moss of Papersafe, Oldham, who is an acknowledged expert in this field. Ten members of the Society attended the workshop, which was organised by David Parsons, assisted by Gerry Jarvis.

Because paper is the medium for all printed maps, Graham started the day with a description of how paper is made and the importance of fibre direction when working with paper. As a first practical exercise we were required to make a notebook, stitched with thread, which we used to make our notes, for example, on how to determine which way the grain of paper goes.

Graham emphasised the importance of procedure in any work undertaken: firstly carrying out a thorough inspection to determine what needs to be done and noting it down, deciding the method, cleaning the paper before commencing any repairs, and finally deciding how best to store the repaired work.

Graham had brought with him all the necessary cleaning and repair materials, all of which are to archival standards, as used by the British Museum. During the morning he discussed and demonstrated cleaning and repair techniques, including how to remove Sellotape and similar tapes and labels; how to remove fungus spots; and how to repair tears and strengthen weak areas. He also covered the limitations of such work. Regrettably, although you can remove Sellotape and any residual glue, you cannot remove the brown stain which can be found on old Sellotape repairs. Neither can you remove some inks, such as old biro.

After a welcome and well prepared lunch complete with lunch there was the chance to put this into practice on maps which we had brought with us, although first attempts were not to be undertaken on our valuable maps!

Finally Graham covered the issues raised by archival storage demands, with practical suggestions for Society members.

David and Gerry are prepared to arrange a repeat workshop if other members are interested, and Graham is also prepared to run an alternative workshop covering the construction of map covers or sleeves, such as those found on some early series maps. The cost of these workshops would be £20, and Graham limits numbers to ten, so that he can provide a measure of individual attention.

For those members who also collect old books, Graham also undertakes repairs at his premises in Oldham.

The Society thanks the Headmaster of Westlands High School for generously allowing the use of the school.

Gerry Jarvis
Eight members assembled to hear Richard Oliver speak on ‘something to do with railways’. (Being Richard Oliver, Lincolnshire entered into it rather largely.) Richard observed that he had been careful not to include the words ‘Ordnance Survey’, which was his excuse for including a set of parliamentary deposited plans of 1902–3 for the Humber Commercial Railway and Immingham Dock and a couple of dozen Bartholomew half-inch maps!

He gave a summary of how railway depiction developed on Ordnance Survey maps, and pointed out that whilst the style of showing railways on nineteenth century maps of Ireland seems odd today, without ‘sleepers’ or other obvious symbology, in fact this was the usual way of showing railways on larger-scale maps: the OS use of symbols and its detailed depiction of track layouts on larger scale mapping was innovative. Richard then went on to discuss a number of anomalies on OS 1-inch maps of the 1890s, including the Claxby ironstone railway which, after closure, was deleted completely from New Series Sheet 89 (although earthworks are still to be seen today), whereas the Edenham and Little Bytham Railway was shown in situ on New Series Sheet 143, ten years or so after the track had been lifted and the rails sold! He finished by showing examples of railway revision on early 20th century Bartholomew’s half-inch, including discreet addition in manuscript by the publisher, and discreet overprinting. An apparent anomaly near Grimsby was explained away by producing an Ordnance Survey 1-inch 3rd edition sheet which Bartholomew had sent to the railway company for them to add the new line, but which did not cover the south end of the route, at which Bartholomew had to guess, and then correct later!

‘Viator’

Visit to the Hydrographic Office, Taunton, Friday, 29th September, 1995

Our visit to the Hydrographic Office was joint with the Society for Nautical Research, which added to its interest. We were welcomed by Barbara Bond, Deputy Chief Executive, who was our host for the day.

Starting with a brief history (the Hydrographic Office dates from 1795 — only a little younger than the Ordnance Survey), she developed the role of the Office in charting British and dependent territories’ waters through to the significant part it now plays in International Hydrography. Most members will be familiar with the concept of Notices to Mariners, issued weekly to keep printed charts up to date, but which have to be administered manually; one very recent innovation is the introduction of the Admiralty Raster Chart Service (ARCS), which is a CD ROM based system, and which embraces the facility for up-dating from a weekly disc, but each new issue disc holds all the previous amendment data.

Visits to one of the Chart Compilation rooms followed where we were shown the techniques for chart production, and to the ARCS Flowline office where we were shown the process of chart preparation for copying onto a compact disc. The demonstration of ARCS was fascinating: it doesn’t remove the Art of Navigating, but it does remove most of the drudgery of marking position lines on charts. A ships passage marked on the ‘chart’, actually the screen, can be stored in the computer system’s memory.

After an enjoyable buffet lunch, we were taken to the Archive room — more
properly, The National Archive of Maritime Cartography — by Ken Atherton, the Curator. Passing row upon row of chart cabinets to house the some 2·5 million items of original survey data and growing at a rate of 1600 items a year, we arrived at the display of original surveys dating back to the 1700s, the original survey ships logs, and the original water colour sketches and vignettes of foreign coasts. These latter looked as fresh as when they had been painted as they rarely see the light of day, and executed to the convention that the height is emphasised 3:1. Included in the exhibits were a 1747 chart of the Spanish Caribbean on calf skin, and a 1523 atlas. Record copies of Admiralty charts have been retained since 1878 and copies of older charts have been obtained from other libraries and added retrospectively. Whenever a current chart receives a major correction (e.g. a new edition) or ten Notices to Mariners have been added to it, a record copy is retained, thus enabling the history of a chart to be followed from earliest times to the present day. The archive also holds a collection of Ordnance Survey mapping.

The afternoon finished with tea, and the Society would like to record its thanks to Barbara Moon and Ken Atherstone for hosting the visitors to an interesting and fascinating day, and to all the other staff who gave of their time to talk with us and explain their activities.

Shap Meeting, 21st October, 1995

This was the third meeting held at Shap, and very enjoyable it was too. Most members attending arrived on Friday evening — not least because of the road works on the M6 at the Thelwall Viaduct (even those intending to arrive at Friday lunch time didn’t make it until well into the afternoon.) A pleasant evening was passed, meeting old friends and making new ones — as well as commiserating on the M6 problems!

Saturday dawned bright and very frosty, beautifully clear and worth the trip after breakfast to the top of Shap road summit to enjoy the view and be back in time to have coffee and for the start of the meeting at 1100. Twenty-eight members and one guest assembled to hear Chris Board talk about the Ordnance Survey Quarter-inch map, taking us from the First through to the Fourth Editions. Chris’s interest in the Quarter-inch started when he acquired one with an ‘A’ suffix, and he wanted to know why, so he collected material, read what was available, including previous Sheetlines articles, and built up his expertise.

The production of a Quarter-inch map of England and Wales was initially chequered, starting in 1859, stopped in 1872 and resumed in 1884; it came in for profound condemnation and in 1892 was criticised in a leading article in The Times. Following the footsteps of the One-inch the second version of the First Edition had simple colouring, and was published with red and white covers. The Second Edition, started before the First World War, was cruder in its colouring, but in larger sheets with the ‘cover’ printed onto the linen backing. The Third Edition, produced immediately following the First World War, introduced layers to the map and was published in blue Ellis Martin covers, although some were brown; the Fourth Edition was a variation of the Third, omitting the dark green lowest layer of the contouring. More importantly, whilst the Third Edition was on the Cassini projection, the Fourth was produced on the Transverse Mercator based on the Delamere meridian, although the difference is not great at this scale. The Scottish Quarter-inch, numbered
in a separate series, was on the Bonne projection.

Of the town plans which were included in the Third and Fourth Editions, only two sets were coloured, those in Southern England and Edinburgh and Glasgow.

A number of examples of the maps were shown and ‘explained’.

After a relaxing lunch, Tim Nicholson had the afternoon shift in which he talked with us about the aeronautical versions of the Quarter–inch map. Putting the subject into perspective, Tim told us that The Times had reported on 13th May, 1911, that there were 57 licensed pilots; in 1922 the Royal Air Force had only 20 aircraft, increasing to 452 by 1932; and on the civilian side, in 1925 there were 16 private aircraft, increasing to 385 by 1931 — although by that time there were 2300 pilots. An initial proposal was made to use the Half–inch map series for aeronautical maps but this was considered to be too large a scale. The Quarter–inch allowed that 60 miles in one hour would cover only 15 inches across the map.

During the First World War the Royal Flying Corps required aeronautical [land] maps, but interestingly the Royal Naval Air Service used maps based on Admiralty charts! In 1919 GSGS took over all service mapping although it was later decided that the Ordnance Survey would provide the aeronautical maps.

The concept of an aeronautical map eliminated all inessentials and the faint grey edition of the Third Edition showed sienna roads, red railways, grey hills, towns red, and included church spires, chimneys, cemeteries and golf courses. Later, information supplied by the Air Ministry was shown in black — radio transmitter stations, Radio Direction Finding Stations, aerodromes, sea plane stations, air lights and marine lights. Air corridors were also included. The R.A.F. edition was For Official use only from 1925 to 1948 and its colour scheme became: low level ground (less than 400 feet) white, layered from 400 feet upwards, railways in thicker black, roads sienna, and water deep blue. Aerodrome names were shown in red overprint.

In 1932 an eight mile overlap of sheets was introduced, the height layers printed in purple, the maps were folded Michelin style, and at the same time the number of symbols was increased from 7 to 37! Not surprisingly, the air information was the same on the civilian and military maps, and in a similar manner to Notices to Mariners for amendment of charts, Air Ministry Notices to Airmen were issued.

Mention was made of the Automobile Association’s general flying map using the standard Third Edition, the Field magazine map, and the Stanford’s ‘Otter’ rain–oil map. Again a number of examples of aeronautical maps were shown and discussed.

At the conclusion of Tim’s talk, members had the opportunity of a general discussion and to look at items which others had brought and were on display.

Our thanks go to both Chris Board and Tim Nicholson for a most interesting and enlightening day.
The social side of the meeting continued with a post tea walk in the gathering gloom along part of the pre–A6 road which climbed over Shap, being wary of meeting the free roaming bull on the hotel drive! Dinner was again convivial with good food, good company and ready access to the bar!

On Sunday morning we awoke to a grey drizzle, and those with more energy than sense ventured forth for a conducted walk around Clifton where the last battle on English soil was fought in 1745. We thank Geoff Goodhind who made both the walk and the history of the battle interesting, although it was hard to imagine the modern A6 as a narrow, walled, sunken lane. We did stop at the local hostelry to sample the local ale and idly wondered why the English and Scots hadn’t called ‘half time’ to slake their thirsts.

As the morning drizzle turned to heavier rain in the afternoon most members departed homewards, leaving but a few to enjoy a relaxing third evening discussing, amongst other topics, maps past, Recording the Changing Landscape, and Railways. The ladies had decided to form a “breakaway group” to discuss the more important things of life — whatever they might be.

Finally, our thanks to Steve Simpson for organising the logistics of the weekend and ensuring a pleasant and satisfying stay.
A Map in my Collection

7 — 1:50,000 paper covers

Bill Batchelor has investigated those maps with integral covers in his collection and below lists the appropriate characteristics.

In the column Cover Type, M indicates that the main feature on the front cover is an index map which is positioned in the lower half and is an extract from the 1:625,000 scale ‘Routeplanner’ series map, with the Landranger sheetlines overprinted in black to show the coverage of that particular map. (This is the style as used on the privately published Caravan and Camping Club Site Index Map.) P indicates that the main feature is a colour photograph as on the current Landranger maps. Some of the maps were sold with removable plastic protective covers. The Blackburn and Burnley map was produced in both First and Second series styles, and he believes that there was a third version with the legend block positioned to the bottom left hand side of the sheet, but does not know whether this was a First or Second series.

Sheet 103 came with a questionnaire to find out users’ feelings on integral covers, which Bill duly filled in and returned. He has a letter from the Ordnance Survey dated 15 July, 1980, thanking him for completing and returning the questionnaire, but, unfortunately, as he was not amongst the first 100 to do so, he would not be receiving a free copy of the OS Descriptive Manual.

Bill has a preference for integral covers ‘...as they enable the map to be folded any way required and are easier to stuff into anorak pockets. I am sure that Landranger maps would be 50p cheaper than they are now if they had integral covers, for example, as is with the Pathfinder maps and the Michelin 1:200,000 maps of Britain (card cover glued to map) and their 1:200,000 maps for the rest of Europe (integral covers).’ There have, of course, been more recent OS maps with integral covers such as M25 and London, Inland Waterways of Great Britain, Isles of Scilly, Maritime England, Londinium, and the free index maps for Pathfinder and 1:10,000 maps, and no doubt others.

### 1:50,000 SCALE Landranger MAPS WITH INTEGRAL COVERS

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14— Kent Six–inch Map

Ian Mumford has written that a considerable number of large scale maps and plans of Home and Overseas Commands produced by the Ordnance Survey under the instructions of the Director of Works (QMG7), War Office, are listed in the FOUO Catalogue of Maps...which are not on sale to the Public. 1935 (O.S.O.–352–150–2.35). Copies of most of the listed maps, and many others, will be found in a variety of classes in the PRO, and of some in the principle national map collections following a distribution of copies in 1985.

15— ‘Vision of England Series’

Lionel Hooper knows nothing of this series (of books?), but came across the map illustrated tucked inside a copy of the Ward Lock Red Guide of the Isle of Wight at an auction. Fortunately, staff at the auction room allowed him to take it away for an hour to get a colour photocopy of it. Comparing it with his own collection of Quarter–inch maps, it appears to be a variation of the pre–war Fourth Edition in that it omits Ministry of Transport road numbers and has no height layers, but shows the woods (designated ‘Open Spaces’ on the variation). It appears to have been printed by Stanford, London. What does the number ‘347’ mean after the required acknowledgement to the Ordnance Survey; what was the Vision of England Series; do any members have other examples of similar maps?
Visit to the Royal Geographical Society and the Science Museum: from Ian Mumford

In 1952, when I was an Assistant in the Map Room, RGS, I was encouraged to set up a new category “Ordnance Survey Specimens”, number 1 to 93. The idea was to keep together a wide range of examples of OS work which it would have been difficult to incorporate in the main map collection without losing the essential distinguishing feature of provenance. The need to do this first arose when, in the process of re-cataloguing a defunct category of atlases in sheets, I found a broken volume of maps and illustrations which had been the large-paper copy sent to the House of Lords with Henry James’ first Report on the OS in 1857. Whole sheets were there instead of the extracts to be found in the other 1500(!) copies of the Report with which James apparently intended to make himself known. I found other uncatalogued relics of exhibition copies and lecture oddities which, in the tradition of Mr Allen and other Map Curators long gone, had been kept ‘in the Map Curator’s Drawer’. The items from the 1857 Report were numbered 1 to 29 in the apparent sequence of the report.

In its original concept the category was to include additional copies of items already in the main collection, so that comparisons might be made of several copies of such variable impressions as the Killarney map, and unhandled copies of some of the more pored-over primary copies. In principle, the main collection did not include duplicates; this apparently changed at a later time since some of the items were removed to the main sets, and the provenance clouded, if not lost. Number 30 is the map of part of North Wales noted by Rob Wheeler as being from 1869. In fact, as the index to the Specimens shows, it was engraved by Freebairn in 1838, using Bate’s Patent Anaglyptograph. John Bate had taken out a patent on 9th April, 1832, related to “Machinery applicable to the imitation of medals, sculpture, and other works of art executed in relief”. I was struck by the apparent similarity of effect to that achieved by Professor Tanaka Kitiro in his Orthographical Relief Method (Geographical Journal Vol. 79, 1932, pp213–219), which was subjected to a scornful note by Winterbotham at the OS .... “We cannot afford to spill ink to no effect”...in vol. 80, pp519–520, illustrated by a bit of Perth terrain. At the British Association meeting in Bristol in 1836, Mr Dawson, “one of the ablest draughtsmen employed by the Ordnance Survey”, exhibited a small map of North Wales produced by the process. Several other small maps appeared as illustrations in books. The most significant products of Bate’s machine were the map of the Pyrenees in four sheets which formed part of the Wyld Atlas of maps of the war in the Peninsular and the south of France (1841), and the maps illustrating Siborne’s account of the war in France and Belgium (1848), especially the Battle of Waterloo, and at Wavre.

The concept of a medallion engraving machine had earlier been developed by Achille Collas in 1830, and there were later variants. The main defect as far as maps were concerned was the need for a perfectly dimensioned 3–D model of the relief before the machine could hope to produce more than a merely dramatised representation of the relief. For the construction of such a model detailed contoured maps would be required and were generally not available; a hundred years later Tanaka Kitiro showed how detailed contour maps themselves could be used for a similar sort of profiling purpose.

Another item noted, number 24, also from the 1857 report, is the One–inch map of Edinburgh which has hand coloured zones of altitude with contours illuminated. An engraved version of this was issued for sale the following year with the layers printed in a grey stipple. Later uses of the same idea are well known, such as the Lake District block of One–inch maps, and many other examples. Professor Tanaka Kitiro published his proposal of a system of illuminated contours in the Geographical Review in 1950, and subsequently the Japanese Maritime Safety Organisation published in 1952 a very dramatic Depth Curve Chart of the adjacent seas of Japan (No.6901).
The Evolution of the Ordnance Survey National Grid: from Peter Chasseaud (117)

May I congratulate Richard Oliver on a most interesting article on The Evolution of the Ordnance Survey National Grid, and also supply a bit of additional information?

Richard says about the British 1914–18 system of artillery squares: “it probably never appeared on a map at a smaller than 1:40,000 scale on the Western Front.” In fact the 1:100,000 scale administrative base maps of army areas were regularly issued in 1917–18 with the squaring system, being produced by photo–reduction from 1:40,000 GSGS 2743 sheets. These maps were used, among other things, for regular “Situation” and “Enemy Order of Battle” overprints, the base map normally being printed at the Ordnance Survey, Southampton, and the overprinting being done in the field survey company/battalion HQ, or at GHQ.

An example of one of these maps, of the Cambrai area, with the Enemy Order of Battle overprint for 1st December, 1917, (German counter–attack) is given on p134 of my trench map atlas Topography of Armageddon; this map also appeared in one of the Tales of the Map Room series on television, and may feature in a forthcoming Timewatch programme about tanks in the First World War. It can be seen how clearly the reference squares show up.

I have seen a similar administrative base map at the (unauthorised) 1:80,000 scale, but do not recall anything at a scale smaller than 1:100,000. The next authorised scale was 1:250,000, on which the tiny 1,000 yard squares would have been a nonsense, though the 1:40,000 sheetlines and even the 6,000 yard square areas (without their 1,000 yard sub–divisions) could have been shown. The main problem with these 1:100,000 was that, being reductions of the 1:40,000, the tight–packed, village names were almost illegible. The utility of having the same squaring system for reference as the larger scale sheets is obvious, and the sheet numbers of the 1:40,000 sheets from which these maps were reduced were given in the margins. Ease of reference would have been improved by having the squaring overprinted in a different colour, as was done with gridded maps after 1918, but this would have meant redrawing.

It is interesting to consider why the series originally published at 1:100,000 (GSGS 2364) was not used as the administrative base map. In some cases it was, but in general it was too inaccurate and out–of–date (being derived from the Belgian 1:100,000 and the French 1:80,000), did not carry the squaring and, worst of all, did not agree with the detail of the larger scale series (1:40,000, 1:20,000 and 1:10,000) used for most tactical and even for administrative purposes.

One other point: Richard states that the large scale “…training maps of parts of Britain.....were straightforward photographic adaptations of the six–inch”. In fact my list of Artillery Training Maps in the BLML, which he refers to, makes it clear that some of these sheets, particularly of the Salisbury Plain area, were redrawn in GSGS style, with considerable revision and addition to detail.

Staffordshire County Council Map Cannock Chase —Area of Outstanding Natural Beauty

Richard Oliver has recorded the publishing of Explorer 16, Cannock Chase and Chasewater. Until now the Area of Outstanding Natural Beauty (AONB) known as Cannock Chase has been covered by the four maps in the Pathfinder Series, 850 Stafford, 851 Abbots Bromley, 871 Cannock (North) and 872 Rugeley and Lichfield (North). The only map which has covered the AONB in total is that produced by the Planning Department of Staffordshire County Council at 1:25,000, reproduced from the Ordnance Survey map with the sanction of H.M. Stationery Office.. This map is still available (at September 1995) and clearly shows the boundary of the designated area. On the reverse of the map is information about Cannock Chase, including flora and fauna. When visiting the Chase I have found this map an excellent one to accompany the various OS 1:25,000 series maps. David Kimber
The original photograph from which The Lake District map cover was taken.

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STOP PRESS

NEWS FOR CARTOGRAPHIC INSOMNIACS

It has come to my notice (as my old headmaster used to say when about to lecture us boys during assembly on some malpractice) that the Ordnance Survey has been spreading lies and misinformation on the number of sheep in a certain field bordering Loweswater. In Map Cover Art (Southampton, Ordnance Survey, 1991) it was reported (p.134) that the original photograph depicted seven sheep, from which five were deleted, before two of them were reinstated. I am, of course, referring to the two versions of Alfred Furness’s cover photograph for the 1948 one-inch Tourist Map of the Lake District. Before the above mentioned organisation sues me for libel, perhaps I had better admit that the fault is my own. In mitigation I would plead that my source was the published version of the photograph in Alfred Furness’s The English Lakes (London, George Allen & Unwin, 1949) where indeed there is a display of seven sheep in the field, contentedly munching grass. I am happy to report to the society’s insomniacs that the original negative of this photograph has been located, and that the sheep count has now risen to ten, or, to be precise, nine and a front end. The explanation of the discrepancy is simple, that the image on the negative has ragged edges, and it had to be trimmed prior to publication. In the book version the area excised contained two and a half sheep in the right foreground, and the remaining seven were left in peace. Unfortunately, where the map covers are concerned, the explanation is slightly more complex. Connoisseurs of the cover will have noticed that the two-sheep version is centred about a quarter-inch more to the right than the four-sheep, and this actually includes the area to the right where two of the newly identified sheep are, or rather ought to be, in the words of the song, safely grazing. The extra half sheep is even further to the right. Thus, seven of nine, not five of seven, sheep were duffed out by the Ordnance Survey. The four-sheep cover shows a section of road to the left, and on the right that only leaves space for one of the new pair of sheep. Even that is not quite the whole truth and nothing but the truth, because the four-sheep cover on dissected maps is wide enough to show the road to the left as well as both the sheep to the right, were they still visible (which they aren’t). And if this paragraph hasn’t sent you to sleep, nothing will.

Roger Hellyer, zzz zzz

...AND FOR THOSE OF YOU NOT YET ASLEEP....

.....can you identify the position from which the photograph was taken from the accompanying One–inch map extract (no cheating — no using a 1:25,000 map!!)
The evolution of the Ordnance Survey National Grid
Addendum and corrigenda

There are a few changes to my article in Sheetlines 43 to be noted:

Page 32: the British System grid also appeared on the 1:24,344 (true ‘two-and-a-half-inch’) map of Eastern England, GSGS 3036, where the grid figures were given on the map for alternate squares, as in the accompanying illustration. I would be interested to know whether this style of map-face grid-figuring was used on any other GSGS series.

Page 33, right-hand column, last paragraph: Rob Wheeler has pointed out to me that a British System grid reference with three letters, e.g. CSV 4981, would repeat once every 1250 km, not once every 5000 km! It is therefore easy to see why the War Office adopted the Modified British System.

Page 40, left-hand column, lines 7-9: Rob points out that the reference 5403 4112 should convert to TA 403112 (not TA 540112!!).

Richard Oliver

Grid figures on map face of GSGS 3036 Sheet 128 E, 1:25,344
(Ordnance Survey 19 February 1917, Reprinted at the War Office 1925)

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