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The recent AGM marked the retirement of Rodney Leary after seventeen years as Membership Secretary with the presentation by Chairman Gerry Zierler (left) to Rodney of a two-volume German coastal survey of Ireland and the election of Stephen Braim to the post.

At the same time we have introduced new procedures for mailing Sheetlines, which is now being sent out direct from the printers. If any problems have been caused by the new distribution arrangements, please notify the editor.

Since 2008 we have produced a series of classic map reproductions specially chosen for their rarity, aesthetic appeal, and significance within the story of the Ordnance Survey. Maps from the past are distributed with Sheetlines at no extra cost to members. We are now inviting suggestions for future maps in the series, especially those which are unfamiliar, attractive, and historically interesting. Please send your suggestions, with as much information as possible, to the editor.

John King will lead another ‘London meander’ circular walk, this time in the City of London, which will include a number of maps and other quirky details and will end by going up in the world on an OS theme. The walk will be on Saturday 16 September and repeated on Saturday 28 October. Contact Bernard Anderson to book your place. An account of the most recent meander appears on page 2.

Advance information about future visits appears on page 65. Suggestions for meetings, events and visits to venues throughout the country are particularly welcome. We need your input to help put create an interesting programme. Please let Bernard Anderson have your thoughts and ideas.
A Central London cartographic meander

John King

This article describes and explains the locations of certain maps and buildings with a cartographic connection in Central London (West End). The maps and buildings were observed on the two CCS walks in March 2017.

Inevitably there are a large number of maps on display in London particularly at railway and underground stations, and at bus stops. At underground stations there are also available Continuing your journey leaflet maps which make use of OS base material. Additionally, across London there are now more than 1500 pillar map signs of the TfL Legible London ¹ wayfinding system.

Some of the maps seen on the walk may be described as ‘legacy maps’ whilst others are more modern. The Strand map sculpture is comparatively recent. Reference was also made to many underground features some of which have been or are shown on OS mapping and some which are not.

An example is the Kingsway tram underpass shown on old maps and now shown as the Strand road underpass although much shortened and altered. No maps have been found of the period between 1952 and 1964 when the tramway underpass closed and the road underpass opened. Was the feature still shown on OS maps in the intervening period?

Aldwych Station still has a physical street presence but is no longer shown on Underground maps having closed in 1994. However, the tunnels are still there as is, at the time of writing, a platform with a live track.

Another station that has disappeared from the Underground map is the Jubilee line station at Charing Cross which opened in 1979 and closed in 1999. The platforms and live tracks are still there as are the two tunnels which continue under the Strand almost as far as Waterloo Bridge. When Charing Cross Underground station (Jubilee Line) was built two construction tunnels were built underneath Trafalgar Square. One of these tunnels has a notable kink to avoid passing directly beneath Nelson’s Column. These are just a few Underground features which are not shown on OS maps.

However, there are some features shown but not named on OS maps which link to these underground features. On the east side of Craven Street there is a large ventilation shaft capped with four fluted chimneys shaft associated with the Jubilee Line at Charing Cross. Another is located at the far end of the Strand near Southampton Street, not visible from the street but clearly marked on the map.

The walks took place in a fairly restricted area and the locations are listed in the order visited. No doubt there are other maps and buildings to view in London. A future City of London cartographic walk and article is planned but it would be interesting to know of other examples from around the UK.

¹ See http://content.tfl.gov.uk/legible-london-product-range.pdf

Above: John King (centre) with CCS group on cartographic meander, 18 March 2017
Maps: London, Brighton and South Coast Railway tile maps of the main and suburban railway systems.

Location: Victoria Station. In the passageway to the right-hand side of the ticket office on the western concourse. The maps are located in alcoves on the right.

These two tile maps are hidden away in a dark passageway and probably date to the completion of the rebuilding of the LBSCR station in 1908. Each map has a rich gold and green mosaic title. The map of system has approximately 143 tiles whilst the suburban map is smaller at 121 tiles.

The map of system leaves off almost all other railway lines but does include all of the Isle of Wight lines and the Selsey Tramway. The key indicates motor halts, golf links, race courses (including Gatwick), harbours for yachts, military stations and castles. In the top left-hand corner, there is a large cartouche of the LBSCR arms whilst in the bottom right-hand corner there is a small vignette of a cross-channel steamer.

The map of suburban lines shows far more ‘other’ lines but is highly selective. The City and South London Railway is shown as having reached Euston (May 1907) but in the south is only shown as far as Oval. The Metropolitan and District Circle line is shown together with the Bakerloo and Central Line as far as Bank. Not shown are the Piccadilly (GNPBR) or the Northern (CCEHR). Intriguingly the link between Old Kent Road and the East London Line (closed in 1911) is shown with a route all the way through to Liverpool Street. This link was rebuilt and reopened as part of the London Overground outer circle in December 2012.

The suburban map besides showing motor halts, golf links and race courses does show selected parks and a detailed layout of the Surrey Commercial Docks. There is one mistake on the map with Cannon Street shown as Canning Street.

There is no clue to the maker of these tile maps and so far, research has not revealed one. No other tile maps of the LBSCR system are known. Victoria Station is Grade II listed but the listing does not specifically mention the tile maps. The maps are protected with Perspex sheeting but infuriatingly this makes photography difficult.

In the same time period the North Eastern Railway produced approximately 25 large polychrome ceramic tile maps many of which still survive e.g. Middlesbrough and Scarborough stations and which were built into the station fabric. The NER even had a tile map in the station hall entrance at King’s Cross which has since been carefully removed and is now in the National Railway Museum at York. The manufacturer of the NER tile maps was Craven Dunnill and Co. The Lancashire and Yorkshire Railway also produced a large tile map which
is still prominently on view at Victoria Station in Manchester. The tile maps were practical in that they were durable and easy to clean (if not to update). These tile maps embodied the pride and confidence of the railway companies that commissioned them.

Map: Underground geographical enamel map
Location: Temple Underground Station on the right-hand side of the entrance

The heritage geographical Underground map predates by a couple of months the publication of Harry Beck’s famous topological or diagrammatic map in January 1933. The blue plate above the map incorrectly attributes the map to the London Passenger Transport Board in 1932. The LPTB was not formed until 1 July 1933. The plate states “that the map has been preserved for your interest” but helpfully directs today’s traveller to an up-to-date Journey Planner inside the station!

The map is in the style of the Fred Stingemore card pocket maps produced between 1925 and 1932. Line colours on the enamel are slightly different to today’s map and are in some places very faded e.g. the East London Line. A number of old station names are shown e.g. Addison Road (Kensington Olympia), Post Office (St Paul’s) and Highgate (Archway). The Piccadilly Line extension to Cockfosters is shown but there is a subtle line colour change between Manor House (opened September 1932) and Cockfosters (opened July 1933).
The enamel map, with extensions, had probably been commissioned before Beck’s map came into circulation. One story concerning how this map survived was that it was covered over with an advertising hoarding and was only revealed when the hoarding was removed.

There are not believed to be any other ‘heritage’ Underground maps displayed on the modern system. The London Transport Museum does have several similar enamel maps whilst at 55 Broadway there is a much larger enamel map displayed on the main staircase between the 1st and 2nd floors but this is not in a public area.

**Map**: Portland Stone map of Strand area on front elevation of building

**Location**: 111 Strand (Waterloo Bridge end). The best view of the building and map is from Burleigh Street looking towards the Strand.

111 Strand is a plain but quite elegant modern building designed by Michael Squire and Partners completed in the Autumn of 2002. The right-hand elevation of the building consists of a large street and buildings map sculpture of the surrounding area made of Portland Stone by the artists Langlands and Bell. The sculpture is made of ten panels over five floors with the actual building at the intersection of the second and third panels up from the bottom. North is at the top of the map.

The artists describe the work as “A vector of cityscape. An axial section of the locality rising perpendicular to the ground in the form of a block and street plan in low relief. The city is upended and represented as a view from above on 5 storey’s (sic) of the buildings (sic) facade.”

The Portland Stone was sourced from Coombefield Whitney quarry on the Isle of Portland and the details were cut by Stirling Stone in County Durham. The source of the map for the sculpture has not yet been established.

**Building**: Stanford’s map shop

**Location**: 26-27 Cockspur Street, best viewed from the north side of the street

Stanford’s is most commonly today associated with their premises in Long Acre but they had occupied many other buildings before their present location.

Stanford’s first map shop had opened at No 6 Charing Cross in 1853 in a position opposite the statue of King Charles I. In the 1860s Nos 7 and 8 were taken over as the business expanded. Unfortunately, in 1874 these premises were compulsory purchased by the Board of Works for the demolition of the adjoining Northumberland House and the creation of Northumberland Avenue.

In the same year Stanford’s purchased 55 Charing Cross on the west side of the open space almost opposite No 6. Again, as the business expanded Nos 54 and 56 were taken over.

The printing and cartographic works moved to Long Acre in 1875/6 leaving Charing Cross as the showroom and business headquarters. Stanford’s did not have much luck since in 1888 the Board of Works yet again made a compulsory
purchase of Nos 54-56 Charing Cross for road developments and the extension of the Mall into Trafalgar Square. (The latter part of this work was not to be completed until 1910.) So again, Stanford’s were on the move this time to 26-27 Cockspur Street, a little way to the north west. At this building Stanford’s installed a red terracotta brick facade which is still in place today. This facade includes the figure of Atlas with the World on his back and two globes. Stanford’s did not stay long at this address since in 1899 the London County Council negotiated to buy the building for their own offices. In 1901 the headquarters business moved to an expanded Nos 12-14 Long Acre whilst a small ground floor map showroom was retained at Cockspur Street until 1905. Today the ground floor is occupied by a branch of the restaurant chain Garfunkels.

Map: Jubilee Walkway route map and site plan
Location: Trafalgar Square, south side of Nelson’s column

The Silver Jubilee Walkway was opened on 9 June 1977 and in 2002 was renamed the Jubilee Walkway. The most noticeable physical features are the pavement ground markers showing either Silver Jubilee Walkway 1977 or just Jubilee Walkway.

In several locations plaques in metal have been erected with maps of the routes which may be considered as part of wayfinding routes but they vary considerably in style and design. Some of the earliest plaques show the route but are relatively crude and of little use for navigation. Over the years new plaques have replaced the old and these are generally far superior in quality and the level of information provided.

The example in Trafalgar Square is one of the later plaques consisting of a route map, local site plan, information and a very useful skyline drawing of the view looking south down Whitehall. Some of the information is given in Braille. The plaque in metal is mounted on supports at a convenient angle to observe both the plaque and the view. Technically this plaque is located just off the Jubilee Walkway but the online TfL map and directions make no reference to this actual plaque.

There are many further distinctively different Jubilee Walkway plaques in the West End and particularly in the City of London.

The Trafalgar Square plaque overlooks the traffic island site with the statue of King Charles I, erected in 1675, on the site of the original Queen Eleanor Cross.
destroyed by the order of Parliament in 1647. (The cross in the forecourt outside Charing Cross mainline station is an 1865 replica.) Behind the statue, set in the paving, is a small brass plaque marking the point from which all road distances are measured.

Whilst researching the area around Trafalgar Square an interesting fact was discovered. The original plans for the Square did not include fountains but they were added in 1845 to reduce space for public gatherings!

**Map:** Trafalgar Way map  
**Location:** Canada House, Cockspur Street. Attached to the railings on the south-east side of the building.

The Trafalgar Way is the name given to the historic route used to carry the news of the Battle of Trafalgar (21 October 1805) from Falmouth to the Admiralty in London. The dispatches were carried by Lieutenant Lapenotiere who arrived at Falmouth on 4 November and made the journey to London of 271 miles with 21 stops in 37 hours at a cost of £46. He arrived at the Admiralty at 1am on 6 November.

In 2005 plaques commemorating the Trafalgar Way were erected along the route and at the stops made by Lt. Lapenotiere. Plaques have been subsequently added at a number of locations with that on the railings of Canada House being added on 6 November 2012. All the plaques have a standard portrait format with a map of the route, details of the event and some site-specific information. The plaque at Canada House states “To honour the men from the territories that became constituted in the Dominion of Canada who fought in the British Fleet at Trafalgar”. The Canada House plaque is the penultimate one of the route with the final being located on the Old Admiralty building in Whitehall.

In 2005 OS issued a special map illustrating the Trafalgar Way. At the time of the walks in March it was discovered that the plaque had been removed although it could be clearly seen where it had been affixed to the railings. Subsequent enquiries with Canada House established that the fixings had become loose and that the plaque was removed for Health and Safety reasons. Assurances have been received that the map plaque will be returned later this year.

**Building:** Fanum House, former Automobile Association Headquarters.  
**Location:** Leicester Square. On the west side of the square in the block formed by Swiss Centre, Whitcombe Street and Panton Street.

The Automobile Association, founded in 1905, had taken over a building on the west side of Leicester Square in 1909. Subsequently an extended purpose-built office building occupying the whole block was completed in 1923.
One whole floor of this building was devoted to the AA’s cartographic output from the late 1920s up until the early 1960s. One of their noted products was the personalised route map booklets showing linear road routes with route instructions, with occasional comments on the landscape, from a home destination to a holiday location which would include detailed and dated town plans. The AA started producing these initially handwritten booklets in 1911/12 and in 1934 issued over 700,000 of them. They also issued ‘Tourlet’ half-day motoring leaflet maps and day drive booklet maps. These booklets are very much items of disposable ephemera but are collected for their information on changing routes. The AA also made use of other map publishers’ products e.g. Bartholomew with their own badging and other details added.

The AA moved their headquarters to Basingstoke in 1972/3. For a number of years they did maintain a map and travel shop on the Whitcombe Street side of the building.

The name Fanum House was used for virtually all of the AA’s regional offices as well as the headquarters in Leicester Square. Fanum was the telegraphic address for the AA the word derived from Latin meaning temple or shrine. The AA’s interpretation of the word was that this was a temple to motoring freedom.

The building is still called Fanum House but the original facades and particularly the roof structure have been significantly altered in the recent refurbishment.

Map: The World Time Today
Location: Piccadilly Circus Underground station. The map is located on the inside wall of the station at the furthest point from the main escalators.

The World Time Today map was a nod (in the 1920s) as to how the world had changed. Piccadilly Circus station had originally opened in 1906 on what at the time was known as the Great Northern, Piccadilly and Brompton Railway. Between 1925 and 1928 the station was completely rebuilt underground to an Art Deco design by the architect Charles Holden in collaboration with Frank Pick, the Managing Director of the Underground group of companies. The World Time Today was one of two maps installed in the station in 1928.
The map shows a time band moving across a Mercator Projection world map. The central illuminated time band, not actually located over the equator but slightly to the north, moves at the same pace as the earth rotates and shows the rough time, using both a 12-hour and 24-hour notation, at any point at any time day or night. Small vertical arrows point from five cities, London, New York, San Francisco, Cape Town and Canberra, to the time band. There is an additional arrow from London to show British Summer Time.

The World Time Today map was constructed by the Underground’s own engineers in the Signal Department Workshops. It was originally driven by a hand wound clockwork mechanism. This was modified in 1993 to a self-winding clock. There is no indication on the map for its source. Putting one’s ear up against the left-hand side wooden framework it is possible to hear the clockwork mechanism.

A second much larger pictorial mural map of The World was installed over the main escalator shaft. This richly coloured map was painted on panels by Stephen Bone (1904-1958) who later became a noted war artist in the Second World War. London was at the centre of this map which was labelled with the names of some countries, principally those in the British Empire, and the names of geographical regions. This map was removed in 1938 and replaced by an Ovaltine advertisement. It is thought that Frank Pick was bowing to commercial pressures since the map location was in such a prominent position. Only black and white photographs survive today of this map in the London Transport Museum collection.

The design of the station and the addition of the maps was very much a collaboration between Charles Holden and Frank Pick, the Managing Director of the Underground. Piccadilly station was seen as “the hub of the empire”. The initial plan had been to install a bank of clocks in the ticket hall to show time at key points across the globe (not dissimilar to the bank of dials showing tube train frequency, since removed). The World Time Today map was considered a more interesting way of displaying the information.

The station is Grade II listed and the map is part of the listing. It is appropriate that directly opposite the map there is a memorial, designed by Langlands and Bell, to Frank Pick and his vision of a modern transport system which was unveiled in November 2016.
Building: John Snow public house and site of pump
Location: Broadwick (formerly Broad) Street, Soho. The public house is located on the corner of Broadwick Street and Cambridge (formerly Lexington) Street.

There are two plaques on the building, firstly a brass plaque at waist height and secondly above is a blue Royal Society of Chemistry plaque (a National Chemical Landmark) at first floor level. Both plaques are in line with the red (or pink) granite kerbstone that marks the site of the original pump.

John Snow (1813-1858) was a physician who is regarded as one of the fathers of modern epidemiology having traced the source of a cholera outbreak in 1854 in Soho to the public water pump on Broad Street.

He had studied the pattern of the cholera outbreak by mapping over a short period of time the location of deaths which showed a concentration around the pump. He used a dot map to illustrate the cluster of deaths as well as statistics to show the connection between the quality of the water supply and the cholera deaths. He was able to persuade the Parish clerks to remove the pump handle which soon reduced the source of infection and deaths. Snow himself admitted that by the time the handle was removed the cholera outbreak had passed its peak and many people had fled the area through fear of the disease. It is believed that a cess pit had contaminated the well which supplied the pump but chemical and microscopic examination of water samples did not at the time conclusively prove the source of infection.

The public house outside of which the pump was located was originally known as the ‘Newcastle upon Tyne’ but it received the name John Snow in 1955. Broad Street had become Broadwick Street in 1936 to avoid confusion with other Broad Streets in London.

There is a certain irony in the fact that the two plaques are attached to the wall of a public house since Snow, a shy and quiet Englishman, was a member of the Temperance movement and strictly teetotal. The John Snow Society, named in his honour, regularly meet at the public house and organise an annual Pump Handle lecture on some aspect of epidemiology.

Inside the public house in the first-floor restaurant can be found an information panel on John Snow, a copy of his map and the importance of his work together with his classic portrait. There are further framed maps including a Greenwood London map.

In 1992 a replica pump, without a handle, was installed on the wide pavement diagonally opposite the John Snow on the north side of Broadwick Street. This was removed in in 2015 during building works but it is understood that the replica will be returned to the site this year.

Building: Home of Major-General William Roy
Location: 10 Argyll Street, Soho. Formerly No 12, near Oxford Circus.

Roy lived at 12 Argyll Street from 1779 until his death in the house in 1790. The house, an elegant four storey townhouse, was probably built around 1736 and first occupied in either 1738 or 1739. The area was one in which a number of military men of high rank resided.

The street was named after John Campbell, second Duke of Argyll, who had built a house in the area in 1706. Argyll Street was renumbered in 1820 when Argyll Place was created for a through road to Regent Street.

Roy had been elected a member of the Royal Society in 1767. It was while he lived at 12 Argyll Street that he conducted in 1783-84 the pioneering work in topographical mapping and geodesy that led to the determining of the relative positions of the English and French Royal Observatories at Greenwich and Paris. Part of this project in 1784 was the measuring of the base line across five miles of Hounslow Heath. This base line subsequently became the foundation for all subsequent surveys of the United Kingdom.

It was on the fourth floor of 12 Argyll Street that Roy constructed his personal observatory. When it was built and what form it took is not known. It might have involved alterations to the fourth floor or a construction on the roof itself. From here Roy took many sightings to prominent London landmarks as part of his project ‘for the improvement of the plan of London and its Environs’. The relative position of Roy’s observatory is tabulated, together with a map, in his submission to the Royal Society in 1790.

The whole property was refurbished in 2014-15 and a fifth storey was added. The owners were taking due note of the importance of the building and there was a watching brief on the fourth floor to see if there was any evidence of how Roy’s observatory may have been built. Sadly, none was found. One find, recounted in Rachel Hewitt’s *Map of a Nation* was that behind a bricked-up fireplace was discovered a copy of Roy’s *Military Antiquities of the Romans in North Britain*.

Today the building has been turned into smart offices with a ground floor retail unit. The building is named The Observatory and on the glass doors to the reception area there is a large hand plate with that name. Inside on the right-hand side wall of the reception area, clearly viewable through the glass doors, is a very large reproduction map of the England and France Triangulation. The ground floor retail space to the left of the entrance doors is today most appropriately leased to the retail chain French Connection!

Both walks produced much discussion and I acknowledge further contributions from Chris Higley, Chris Bartlett, Stuart Dennison and Rodney Leary.

*Group photo by Gerry Zierler, other photos by John Davies*
Solution and solvers

The seaside towns depicted in the puzzle in Sheetlines 108 are Cowes, Holyhead, Kirkwall, Lerwick, Peel, Rothesay, Stromness, Tobermory, Ventnor. What they have in common is that they are all on islands.

Despite the lack of a prize, the puzzle attracted an enthusiastic response; several members offered amusing accounts of the detecting process and many added a comment, some of which appear below. Solvers (in alphabetic order) were: Peter Addiscott (congratulations on the continued high standards of Sheetlines), John Ambler (very much enjoyed the seaside challenge), Peter Bailey (great fun and I look forward to the next), Don Clayton, Rob Clynes (I was probably at an advantage living on one of the Island’s featured in the quiz, but it was excellent fun doing it). Graham Cornell (great fun), Stuart Dennison (I always enjoy reading Sheetlines and the map quiz is always a welcome bonus), Alan D Grove (thanks for the competition, I thoroughly enjoyed it), Paul Jackson, William Heaps and family, Bill Hines, Roger N Holden, LW Knott (I do find these brain teasers really enjoyable – more, please), Rodney Leary (I enjoyed the clever A27 red herring – or should that be Manx kipper), Nick Millea (couldn’t resist it), Philip Pearson, John Savage, Peter Strugnell, Paul Swindell, Dave Vaughan (I do enjoy these map quizzes. It’s the one chance for me to get my name in the journal amongst such august and learned company), John Winterbottom (excellent fun).

There will be another such challenge in December Sheetlines. In the meantime, for those who may have missed them, previous map puzzles were islands (Sheetlines 90) lakes (Sheetlines 103) and small towns (Sheetlines 104).1

Left: It’s the A27, Jim, but not as we know it.

“Malin Head Vertical Datum: This is fixed as Mean Seal Level of the tide gauge at Malin Head, County Donegal.” Chris Higley noted this definition on the OSI website2 and offers the interpretation below.

The great Irish geologist and artist George Victor du Noyer (1817-1869) was featured in Sheetlines 35 (1993) and again in Sheetlines 92 (2011). A major exhibition celebrating the bicentenary of his birth will be held at the Crawford Gallery in Cork from 17 November to 24 February 2018 and later moving to National Museum of Ireland at Collins Barracks, Dublin.

Petra Coffey, who wrote his biography in Sheetlines 35 and who co-hosted the 2011 CCS visit to Dublin, invites CCS members who plan to visit the exhibition to get in touch with her at petra.coffey@gsi.ie.

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1 See the Sheetlines archive on the CCS website for all issues mentioned on this page.
OS Books of Reference (Area books)
Paul Bishop

When the Ordnance Survey mapped Britain by County and Parish at a scale of 1:2500 in the second half of the nineteenth century, the land-use and area of every mapped parcel of land were also recorded and published in the Parish Books of Reference (also called Area Books and Parish Area Books). The fact that the mid- to late nineteenth century land-use was recorded makes these books an invaluable resource, and here I briefly summarise some issues associated with the Books of Reference land-use data. I then assess the quality of the data for Baldernock Parish, a small rural parish covering 4,411 imperial acres on the northern outskirts of Glasgow, comparing the Parish's mid-nineteenth century OS land-use data with farm plans of part of the Parish in 1805 and 1830.

The land-use data
Just as the National Library of Scotland has scanned many OS map series at various scales, including the 25-inch First Edition mapping to which the Books of Reference relate, and made these superb digital versions of the mapping available on-line, so also has the Library had the Books of Reference themselves scanned and made available on-line. The pages reproduce clearly and legibly (figure 1) and it is also relatively straight-forward (if a little tedious) to import pages from the Books of Reference into an Excel spreadsheet for subsequent manipulation. Once in Excel, the data can be sorted by land-use and/or by land parcel area, and areas can be summed and so on.

Each parcel of land larger than an unspecified minimum size on a First Edition 25-inch map (in effect, each enclosed [fenced or dyked] field and other area of ground [e.g., road, house] that is larger than the unspecified minimum size) was given a number, as recorded in the first column in the Book of Reference (column 1 in figure 1; see figure 2 for the corresponding map showing some of the numbered land parcels as mapped). The area of each parcel is given in column 2. Some separately numbered mapped areas are very small – parcel 7 in figure 2 is only 0.08 acre – and there is considerable rationalisation of these areas and their numbering on the Second Edition 25-inch mapping. As well, the Books of Reference ceased publication in the 1880s and the area of each parcel was printed on the map face in later printings of the First Edition and in the Second Edition.

The numbering and area of each parcel are almost certainly reliable – each surveyor’s mapping was checked by a checker and in any event the mechanical nature of assigning a number to a parcel of land and then calculating the parcel’s

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2 http://maps.nls.uk/
3 https://archive.org/details/osbooksofreference I am grateful for having my attention drawn to this website by Roger Hellyer’s note in Sheetlines 104, 64.
area lend themselves to accuracy (especially for OS personnel presumably expert in the calculation of such land areas). I know of no discussion or questioning of these two sets of data. The third column in the Book of Reference gives the parcel’s ‘Description’ (the land-use). Deciding on and recording land-use are less mechanical in nature and it is possible that land-use surveyors made mistakes in this task.⁵ For example, Coppock reported a case of mapped land-use of contiguous fields abruptly changing at a County boundary that would not be expected to have been associated with such marked changes.⁶ I have also found one slip in the Baldernock data that are treated further below: the Book of Reference for Baldernock Parish records a Description of ‘Occupation Road’ for a land parcel (no. 653) that is actually an agricultural field. Notwithstanding such slips, Harley has noted “that the field recording of the ‘state of cultivation’ was not a chance or casual process. … It was … the responsibility of a field examiner, an independent specialist presumably selected for aptitude in such work, and who would soon have built up useful experience in identifying land-use types in the field.”⁷ Nonetheless, Richard Oliver has commented that “the examiners’ classification of land-use was not subject to such close control [as the checking of linework and the authorities for place-names].”⁸

Figure 1 indicates some of the land-uses that were recorded during the 25-inch First Edition mapping. Terms such as ‘Orchard’, ‘House’ and ‘Ornamental Grounds’ are straightforward, as are most of the other land-use descriptors such as ‘Forest Trees’, ‘Underwood’, ‘Bushes’, ‘Furze’ (whin, gorse), ‘Marsh’ and ‘Sandhills’. Many of these terms are not, in fact, land-use in the sense of ‘human’ land-use, but ‘descriptions’, as column 3 in the Book of Reference is actually headed. It is noteworthy – and this is perhaps a key point – that arable (i.e., crops) and pasture, the two broad agricultural land-use types, were not individually indicated by symbols (i.e., agricultural fields were left blank, unless they were, for example, orchards). This apparent anomaly arose in part because a major and enduring issue for OS mapping was not differentiating arable and pasture but the distinction between non-cultivated land and cultivated, the latter including both pasture and arable.⁹ As Harley noted, “The Survey's interest in this line [between non-cultivated land and cultivated] undoubtedly stemmed from the general nineteenth-century trend of waste-land reclamation, culminating in the period of High Farming. But it also became progressively important as a surveying distinction in its own right and after 1855 it was to separate the areas of 6-inch and 1:2500 mapping”.¹⁰ It was thus important for the OS to place correctly

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⁶ JT Coppock, ‘Maps as sources for the study of land use in the past’, *Imago Mundi* 22 (1968), 37-49.

⁷ JB Harley, op. cit., 28.


⁹ JB Harley, op. cit., 29ff.

¹⁰ Ibid.
Figure 1 (top). Cover and pages 1 and 2 of the data pages of the Book of Reference for the 1:2500 First Edition map of the Parish of Baldernock.

Figure 2. Part of the First Edition 1:2500 mapping of Baldernock Parish covering the area recorded in the Book of Reference in figure 1. Land parcel 7 is very small – it lies along the western shore of the loch at bottom centre, and the digit “7” can just be discerned immediately below the “ie” of the “Craigmaddie House” label.
Figure 3A (top). Circular horse gin of the tangential form. Horses walked round the circular roofed and walled building driving a thresher in the adjacent barn. From OS First Edition 1:2,500 Stirling Sheet 32.2 (Baldernock Parish).

Figure 3B. Horse gin of the apsidal form at lower left. The gin was roofed and walled, and the thresher was in the adjacent barn. The half-circle and parallel-walled connection to the adjacent barn accommodated the full circle of the horse walk. From OS First Edition 1:2,500 Stirling Sheet 32.3 (Baldernock Parish).

Figure 3C. Horse gin of the unroofed but walled circular tangential form. As for all horse gins, the thresher was in the adjacent barn. From OS First Edition 1:2,500 Stirling Sheet 32.3 (Baldernock Parish).

Figure 3D. Open air (unroofed and unwalled) horse gin as confirmed by a 1960s photograph. From OS Second Edition 1:2,500 Lanarkshire Sheet 2.09.

Figure 4. Google Earth© image approximating the area of Baldernock Parish. The buff-coloured fields have been recently ploughed and are the fields generally sown to a crop each year; they cover ~8% of the image area. When questioned, local farmers estimated ‘off the tops of their heads’ that arable cultivation covers 10-15% of the Parish’s area, which is broadly consistent with the 8% measured from this Google Earth image. The farmers stated that, if hay fields are included as arable (see text), the arable area increases to about 30%. Hay fields are not distinguishable on the Google Earth image.
the boundary between cultivated and non-cultivated, whereas, as Harley noted, the distinction between arable and pasture “may be less consistently accurate than the simple distinction between cultivated and non-cultivated land.” Moreover, crop rotation and fallowing of land, for example, mean that the use of a particular field could change over time, and the interpretation that such a change in a field’s use was indicative of a change in overall land-use is likely to have been erroneous. Harley noted that fallowing was known by some surveyors to have been part of the regional agricultural practice (e.g., for OS surveyors in the West Country) and was intentionally described in the land-use data for such areas as ‘Arable and Pasture’. However, that term could also have described a situation in which arable and pasture were found within a single field (the smallest unit for which an area was given and a land-use described). The possible uncertainties are clear.

The distinction between pasture and arable becomes critical when using OS mapping to investigate land-use history, as I have done, for example, in relation to doocots (dovecotes, pigeon houses) or horse gin-powered threshing machines (figure 3). Local cultivation of grain crops is a pre-requisite for the installation of threshing machines and doocots, raising interesting questions about an area’s proportion of pasture versus arable in the mid-nineteenth century, when the First Edition County Series were compiled and doocots and horse gins functioned. If an area’s agriculture was dominantly pastoral, then the area might not be expected to have needed threshing machines or to have supported doocots. The timing and rate of spread of horse gin-driven threshing machines into the more pastoral areas of the west of Scotland, for example, thus become key issues in these areas’ local history and part of the understanding the diffusion of agricultural innovation throughout Scotland.

**Land-use proportions in Baldernock Parish as a whole**

Rural land-use in Baldernock Parish in the twenty-first century is predominantly grazing (pasture) (figure 4). Using OS map evidence, I have nonetheless found that horse gins, which processed grain crops (i.e., arable production), were indeed common in Baldernock Parish in Scotland’s western Central Belt by the mid-nineteenth century, with ~40% of farms having a horse gin. This figure is consistent – disarming so! – with the New Statistical Account (NSA), the ‘snapshot’ of every Parish in Scotland that was compiled in the period 1834–45. For readers unfamiliar with the Statistical Accounts of Scotland, these were

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11 JB Harley, op. cit., 32. It is also intriguing to note the earlier Irish mapping at 1:2500 was in part related to the delimitation and mapping of cultivated lands for taxation purposes and to speculate whether this gave a fundamental emphasis in OS mapping to the distinction between cultivated and non-cultivated lands.

12 JB Harley, op. cit., 36.


15 Ibid.
written by the Parish Minister, sometimes assisted by the local School Master, covering for each Parish “a wide spectrum of subjects including agriculture, education, trades, religion and social customs”.\(^{16}\) The NSA for Baldernock reports that farming in Baldernock Parish occupied a total of 2,550 acres, comprising 1,045 acres (41%) devoted to the arable crops of oats, wheat, barley, potatoes, beans or turnips, with the remaining 59% of agricultural land (1,505 acres) being devoted to pasture, hay or fallow. It must be noted that the NSA treated hay as non-arable (along with pasture and fallow), whereas the instruction to OS surveyors that “[Pasture] is only applicable to permanent pasture” indicates that hay was treated as crop.\(^ {17}\) Early nineteenth century farm surveyors, whose farm plans are discussed below, also classified the cultivation of hay as arable. The similarity between one of these surveyors’ and the OS proportions of arable and pasture that is noted below confirms that the OS also classified hay as arable (i.e., a crop). In any event, the NSA proportions of 60:40 for pasture:arable must be a maximum for pasture if hay is moved to the arable class for the purposes of the comparison with the data in the Baldernock Parish Book of Reference.

To obtain the arable versus pasture data for the OS Book of Reference for Baldernock Parish, I summed the respective areas of pasture and arable and converted each to a percentage area of the total of those two figures.\(^ {18}\) I simply used all descriptions that included the respective terms of “Arable” and “Pasture” (including “Rough pasture”), even when the descriptors included additional words, e.g., “Pasture, slope, &c”, “Pasture, slope, & trees”, “Arable & road”, “Arable, trees & part of burn”, and so on. I did this because I assume that the secondary descriptors were more minor land-uses of the parcel of land (but I do note that this assumption might not necessarily be valid because “arable” and “pasture” are themselves never used in the Baldernock Parish Book of Reference as secondary terms in a land-use description, such as in, for example, “Slope & pasture”). Nor did I include “Plantations” in any of my calculations.

In the Baldernock Parish Book of Reference, the “Arable” descriptor is assigned to 84% of the land area devoted to the combined areas of arable and


\(^ {17}\) Ordnance Survey, *Instructions to Field Examiners*, 1905, Southampton, quoted by JB Harley, op. cit., p.33. Although the date of this *Instruction* is many decades after the demise of the *Books of Reference*, Harley argued that these instructions reflected procedures when the *Books of Reference* were still being compiled. Harley also noted that the Tithe Commutation Act in England gave very clear instructions on how to classify various grasslands in terms of arable or pasture, but this clarity was lacking in OS instructions (and in any event, the Tithe Commutation Act did not apply in Scotland).

\(^ {18}\) These calculations were done in an Excel spreadsheet of the Baldernock Parish Book of Reference data, having imported the data from the scanned online Book of Reference into Excel and ‘tidied it up’.
pasture, with the remaining 16% being assigned the “Pasture” descriptor. Given that the Parish was surveyed in 1860 for the 25-inch map sheets, this difference from the NSA’s 1830s-40s proportions of pasture and arable prompted further investigation, for which I used farm plans for those parts of an estate that lie within Baldernock Parish.

**Areas of land-use types in Dougalston Estate farms in Baldernock Parish**

I used farm plans from 1805 and 1830 for Dougalston Estate farms that lie within Baldernock Parish; these Dougalston farms cover 800 acres of the Parish’s ~4,400 acres. In the 1805 plans, the areas of Arable and Pasture (and Planting and Unarable, where relevant) are given in “Scotch measure” (acres, rods and falls [square falls]) for each field in the plan, in a table in the cartouche of plan – figure. 5). Generally, a field is either arable, pasture or planting, but in some cases areas of arable and pasture are given for the one field. Each field on the 1805 farm plans is usefully shaded to indicate arable, pasture or woodland. This shading should of course be consistent with the classification given in the plan’s table of data and, perhaps more importantly, mixed land-uses (e.g., arable and pasture) can be visually represented on the plan itself (the lack of this capacity, as noted above, being something of a shortcoming of OS maps). These various areas were summed by the farm plan surveyor in each farm plan’s table (and for the 1805 plans later corrected in pencil, if the sums given on the plan are incorrect 21). I summed all these correct sums and calculated the proportions of arable and pasture.

The farm plans from 1830 (i.e., from about the time of the *New Statistical Account*) follow a similar structure except that all fields areas are described only as either arable or wood (i.e., woodland), with not a single field being described as pasture; the field shading is not informative with respect to the various land-uses. The lack of pasture in the 1830 plans points either to the preponderance of arable that the OS data indicate or that, for the 1830 plan, the term “arable” also encompassed pasture land and simply meant “farmed” or an equivalent.

The same fields can generally be identified in the farm plans and the OS maps. I have checked the land-use description of each field mapped by the OS and on the 1805 farm plans by superimposing each 1805 farm plan on the corresponding OS map and making the 1805 plan semi-transparent (all this done in PowerPoint). The 1805 plan is then rotated and adjusted to check the coincidence of field boundaries There is a high degree of persistence in field boundaries between the 1805 plans and the 1860s OS maps (figure 6). That is an

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19 Hand-drawn plans of the 21 individual farms of Dougalston Estate, all of which are in the same anonymous hand, with two – the plans for Boghall and Hillend, both in Baldernock Parish – dated 1805 (RHP5302/1-21 in the National Records of Scotland).

20 Hand-drawn plan in six sheets of Dougalston Estate, surveyed by John Fullarton June 1830 (RHP5306/1-6 in the National Records of Scotland). The plan’s summary table gives the area of each field (parcel) by farm.

21 A dated annotation (1831, possibly in July of that year) is on an Estate farm outside of Baldernock Parish but it is in the same hand as the annotations within the Parish and so it is assumed that the Baldernock annotations also date from the same time.
Figure 5. The cartouche on the 1805 plan of Bankell farm in Dougalston Estate in Baldernock Parish showing the land-use and area data for each parcel of land. Note the predominance of Arable, and the pencilled corrections (assumed to be from 1831, based on pencilled and dated comments on other farm plans from the same group of Dougalston plans – RHP5302/1-21 in the National Records of Scotland).

Figure 6 (below). Langbank Farm on the 1805 Dougalston Estate farm plan (left) and OS First Edition mapping (right; OS First Edition 1:2,500 Stirling Sheet 32.6 (Baldernock Parish)). The farm house has been moved between the two sets of mapping but there is virtually complete correspondence between field boundaries on the two plans. Parcel 7 on the 1805 plan corresponds to OS parcels 578 and 591 (centre right), with their respective areas – parcel 7: 19.3 imperial acres; parcels 578 & 591: 21.4 imperial acres – essentially confirming their equivalence (i.e., ± ~10%). Note how the 1805 plan distinguishes Arable (parallel lines symbol) and Pasture (stippling) within parcel 7; the OS simply records the land-use in parcels 578 and 591 as Arable. (The farm plan should be rotated about 20° anti-clockwise to match the OS orientation.)
interesting point in itself for land-use historians. In more detail: of the 800 acres of Baldernock Parish occupied by Dougalston Estate farms, the OS mapped 610 acres as Arable (76% Arable) and the 1805 plans mapped 560 acres as Arable (70%). There is thus quite reasonable agreement between the two sets of data. Some of the relatively small mismatch between the OS and 1805 areas result from the 1805 mapping providing more detail within individual parcels (e.g., 1805 parcel 7 in figure 6).

The correspondence between the percentages Arable (70-75%) and Pasture (25-30%) in the individual farms in 1805 and in the OS Book of Reference surveyed in 1860 is striking and gives considerable confidence in the OS surveying of land-use. This correspondence suggests that the 1830 Estate mapping that indicates that the non-woodland agricultural land-use was 100% Arable is difficult to take at face value, and suggests, as noted above, that “Arable” on the 1830 plans included both cultivated land and pasture.

**Numbers of fields of different land-use types in Dougalston Estate farms in Baldernock Parish**

My earlier discussion of horse gins in Baldernock Parish used an estimate of the numbers of farms (i.e., not area of farms) with and without horse gins on the OS First Edition 25-inch mapping to suggest that the percentage of arable versus pasture was in the order of 40:60. The numbers of land parcels that were given the same descriptors (i.e., Arable or Pasture or ‘Mixed’) in the 1805 and the OS mapping were tallied. The 1805 mapping and the OS gave the same descriptor to 85% of fields, and disagreed on 15%. The match is close.

The more reliable Book of Reference data do not confirm my ‘round-about’ estimate of the proportions based on the number of farms with a horse gin and so the NSA data for Baldernock, which also present ~40:60 arable:pasture proportions, are likewise notably inconsistent with the estate plan and the OS data. This mis-match between the NSA and the OS mapping probably largely reflects the NSA’s classification of hay as pasture. As well, Harley has noted the potential problems in using schoolmasters to undertake the land-use surveys during – to quote an early proposal by the then-Director of the Ordnance Survey to a Parliamentary Select Committee – the schoolmaster’s “walk in the evening or in the morning, to see what crop was growing in certain fields, and that he might, of course, do [this] without reference to either owner or tenant”.22 Crop rotation and fallowing are noted again as possible sources of error, as well as straightforward mistakes by the Parish Minister and/or the Schoolmaster.

It is clear that the OS and the 1805 farm plan are in close agreement, which gives considerable confidence in the OS mapping and the Books of Reference. The agreement is in fact closer than the simple percentages of the total areas mapped that have already been noted. Of more relevance here is the fact that the two sets of maps/plans agree on the land-use description (arable, pasture or woodland) for 93% of the total area of fields in the Dougalston Estate farms in

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Baldernock Parish, encompassing 85% of the number of fields. In other words: the land-uses shown on two completely independent sets of maps – one consisting of 1805 estate farm plans and the other of OS mid-nineteenth century First Edition 25-inch mapping – agree closely with each other, and it is reasonable to conclude that land-use as reported in Baldernock Parish’s OS Book of Reference is accurate, especially given the time gap between the two sets of information.

The consistency of the 85:15 split between arable and pasture in 1805 and in 1860 prompts the conclusion that there have indeed been changes in land-use since the mid-nineteenth century in Baldernock, which is now dominated by pasture and grazing. Interestingly, and unlike the OS procedures, the 1805 farm plans shade each parcel of land according to its generalised land-use – Arable, Pasture, Planting (i.e., planted woodland), or Unarable (e.g., land rendered uncultivable by the remains of mining and limeworks) – with some parcels having two symbols. Thus, a visual impression of the proportions of arable vs pasture is available immediately on viewing the plan. Annotations that were pencilled on some fields on the 1805 farm plans in July 1831 give the crops that were being cultivated in those fields at that date and confirm the dominance of arable land-use. In most cases for Baldernock Parish, the pencilled annotation from 1831 (e.g., “In barley sown down”, “1st crop oats”, “Potatoes 7 acres”, “Sown down”) confirm arable land-use in 1831 in a field that had been mapped thus in 1805. 1831 annotations of “Hay” and “1st cut Hay” in fields that were mapped as Arable in 1805 and whose areas are given under the Arable column in the plan’s table of areas confirm the treatment of hay as arable by the farm surveyor (and presumably by the OS surveyors).

**Conclusion**

The assessment of the OS land-use data in an individual Book of Reference confirms the accuracy of the OS survey data for that Parish. As Harley has noted, the OS land-use surveyors ‘knew what they were doing’ and, notwithstanding some obvious slips, generally seem to have got it right. The Books of Reference thus provide a trustworthy source of information on past land-uses. They are therefore an invaluable resource and probably deserve to be better known and used.

**Acknowledgements**

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New Series to Popular: European parallels

R C Wheeler

The view is frequently expressed that the Ordnance Survey, in the twenty or so years before Sir Charles Close became Director-General in 1911, was increasingly backward with regard to new technology and the use of colour. I want to argue here that, compared to France and Germany, the OS was not doing at all badly. Of course, if one chooses to make comparisons against Switzerland, the OS comes off poorly, but Switzerland is an exceptional case, just as southern Europe presents cases of exceptionally poor cartography.

One caveat: I am conscious that my statements on continental maps have to be made without the benefit of carto-bibliographies and without any archival research: it is regrettable that there do not exist corresponding societies in other European countries with which we might collaborate.

Germany

Turning first to Germany, the flagship product was the Karte des Deutschen Reiches at 1:100k (hereafter ‘KDR-100’). This was to cover Germany in 674 sheets. 48 sheets had been published by 1881, 586 by the end of 1897.¹ It was based on 1:25k plane-table surveys (the Messtischblätter) of the respective states, which in many cases pre-dated unification. Prussia already had a 100k reduction of their surveys, in 350 sheets, which could be incorporated in KDR-100. So completion of the entire country in two decades is not quite as impressive as it sounds. The map was finely engraved on copper ² and was hachured (figure 1). It was available in hand-coloured form, with water-fill in pale blue and boundaries edged in various colours to indicate the different states and the Kreise within each state. The hand-colouring of boundaries is inferior to Stanford’s work: the lines are too thin and the colours too muddy to be read clearly. The price of the sheet at figure 1 was 1.5 Marks. There is a very useful composite made from these at http://www.davidrumsey.com/blog/2011/4/10/karte-des-deutschen-reiches-1893

In the course of the next decade, a second form of KDR-100 was introduced with the hachures transferred to a brown plate and water to a blue plate. Water-lining was introduced to replace the hand-colouring of water fill and contours were provided at 50m intervals. The brown would have benefited from being darker and sharper: looking at Schwaneweder Heide on figure 2 the eye gains the impression of a fuzzy layer-colour rather than the detail that ought to be conveyed by hachures.

The first decade of the twentieth century also saw the launch of a 1:200k series, the Topgraphische Übersichtskarte (KDR-200). This was a reduction and generalisation of KDR-100 which also took data from the original Messtischblätter to provide, for example, contours every 10m. It was available in four colours:

¹ Notes on the Government Surveys of the Principal Countries, HMSO, 1882; A Knox, A Guide to Recent Large-Scale Maps, 1899, as a supplement to the foregoing.
² In 1899, parts of Brandenburg and Saxony were on stone rather than copper.
Fig 1.
KDR-100 Sheet 630 (Colmar), 1888

Fig 2.
KDR-100 Sheet 206 (Bremen), 1910 state

Fig 3.
KDR-200 Sheet 139 (Frankfurt am Main), 1900, printed 1905.

Prussia is edged in purple, the Grand Duchy of Hesse in mauve. Readers are invited to ponder which territory Homburg is in. The subtle greenish blue for meadow can just about be seen alongside the stream immediately N of Homburg.
black detail, brown contours and blue water (including water-lining); there is also a light greenish-blue printed over areas of meadow (figure 3). The map already has a symbol for meadow, taken from KDR-100, but this fourth colour allows the area to be shown more exactly (based on the Messtischblätter) without cluttering the map. The effect is quite charming but hardly seems to justify the expense of a fourth printing. Sale price was again 1.5 Mark.

Finally, one must mention the 1:300k Übersichtskarte, which started as early as 1893 and which, by no later than 1909,\(^3\) was being printed with blue water, red-orange fill to main roads, and dull green fill to woods. Relief was shown by rather nasty hill-shading in brown. The existence of this series caused KDR-200 to be abandoned uncompleted.

Why was the 1:300k so much more innovative? I believe it was because it was primarily a military product and was produced by the Prussian Survey alone. Germany lay on a cartographic spectrum stretching from Prussia, interested in depicting marshy lowlands, to Bavaria, where depiction of Alpine terrain was the supreme challenge.\(^4\) The larger scales could accommodate these diverse requirements; but to produce a common specification for 1:200k and smaller scales that would satisfy all the constituent states must have been difficult.

**France – Carte Vicinale**

Turning now to France, the story needs to start with the Carte Vicinale. This was announced in a circular from the Interior Ministry to all Prefects, 17 August 1878.\(^5\) The justification for the project was the need for a large-scale map to assist decisions on railway and road projects – both *routes départementales* and *chemins vicinaux*. (*Large-scale* seems an odd term for a 1:100k map, but these things are relative.) Some such maps had already been compiled by officials of the ministry’s Service Vicinale\(^6\) but being of different styles and different scales, they did not fit together when something was needed straddling two Départements. The new project was to produce a uniform map covering the whole of France in 570 or so sheets each of a quarter by half a degree. Each sheet was to be on a separate polyconic projection, this being ‘more exact and more rigorous’ than that of the General Staff map (*carte de l’état-major*). (This seems to be a reference to the distortion that occurs away from the centre with a map of the whole country on a single projection.) The specification had been drawn up by a commission which included representatives of the *ponts et chaussées* and also a civil engineer, Edouard Anthoine, *chef du service de la carte*

\(^3\) AR Hinks, *Maps and Survey*, 1942. The series had a long life and some later printings do not carry a print code, which makes it difficult to establish from map specimens when the first four-colour specimens appeared.

\(^4\) From 1903, the Bavarian survey started to produce mountainous sheets of its 1:50k Topographische Atlas with brown contours and violet hill-shading. The existence of maps by a private society, the Alpenverein, must have acted as a spur; the Alpenverein had links to the official Swiss survey. See E Arnberger, *Die Kartographie im Alpenverein*, 1970, 8.

\(^5\) Bulletin officiel du Ministère de l’intérieur, 1878, 333-338. It is available at [http://gallica.bnf.fr/ark:/12148/bpt6k5539759v/texteBrut](http://gallica.bnf.fr/ark:/12148/bpt6k5539759v/texteBrut)

\(^6\) As early as 1868 in the case of the Département des Landes.
The small size was presented as a great convenience to users needing to consult more than one sheet at a time – which would certainly be a problem with the General Staff map.

The map was to be in four colours: black for detail, railways, and chemins ruraux – the term is used in a technical sense that related to maintenance responsibilities – blue for water, green for woods, and red for roads other than chemins ruraux. The use of red was the biggest novelty here, but the use of red line-work for roads was something of a French tradition in manuscript maps and, if the road network dominated the map, that was not inappropriate in a map intended primarily to show the transport network in a manner that indicated responsibilities for upkeep. The map was to be compiled by sending out sheets of the 1:80k General Staff map to the agent voyer en chef of each Département. Through the officials of the Service Vicinale, they were to correct and update these, providing also the extra information which the circular stressed as being so very useful: the distinction between double- and single-track railways, places with Post and Telegraph offices, and population figures.

The central administration would deal with the reduction to 1:100k (and the change of projection) and the transfer of the fair copy to stone, which would then be stereotyped (clichée) to copper. Sheets covering the Haute-Vienne and Lozère had already been produced, and had been exhibited that year at the Exposition universelle. The sum of 100,000 Francs had been voted for the continuation of the work and it was expected that the whole of France would be completed within four years. Copies would be placed on sale at a modest charge sufficient to meet the cost of printing and paper.

The absence of any representation of relief was recognised as a defect. A contoured map would be better. This would require a country-wide network of levels (un nivellement opéré sur une vaste échelle et fait avec la plus scrupuleuse exactitude); nevertheless, the Minister hoped it might be accomplished.

I have summarised the announcement at some length here, both because so detailed an announcement of a new map is remarkable in its own right, but also because it tells us a lot about the Ministry’s thinking. The new map was to be produced cheaply: revision was to be done as a secondary duty by officials whose normal responsibilities were akin to those of the English road surveyor; turning their draughts into a printed map could be organised centrally on a production-line basis.

We need to understand the Ministry’s thinking because embarking on an activity that had previously been a responsibility of the Ministry of War was a remarkable thing to do. Moreover, the harsh criticisms of the General Staff map make it clear that the move was not being made with the concurrence of that Ministry. The new map was termed Carte de France, not, it is true, in the map’s

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7 Anthoine is described in the catalogue of the Exposition universelle as agent voyer inspecteur so was a senior Interior Ministry official. The Carte de France referred to is the Ministry's own product, outlined here.

8 This official had under him the agents voyers of the Service Vicinale, in several départements also the staff of the ponts et chaussées.
title, but it was referred to as such at the *Exposition universelle*, and the words appear on the blind-stamp applied to each copy before it was placed on sale. The implication is that it was seen as the premier map of the country, with the General Staff map being purely a military product.

In most countries and in most eras, a hostile bid by a civil ministry to take over a function traditionally carried out by the Army would be almost unthinkable. However, French politics in the late 1870s were far from normal, with a vicious struggle between republicans and monarchists. The Right, and almost the whole of the Army, was monarchist and, following the crisis of 16 May 1877, had suffered a massive and unexpected defeat in the subsequent elections. So the timing was right for such a move.

Perhaps the most interesting aspect of the announcement is the aspiration to have contours. Was Anthoine or his Minister seeking to take responsibility for this? The problem was not as great as might appear: the *Ponts et chaussées* had already run levels along their main roads, and several *Départements* had already established networks of levels over their territories; if their multiple datums could be reconciled, there was scope to produce a national network that was good enough to serve as a basis for contouring. P-A Bourdalouë, *Conducteur* to the *Ponts et chaussées*, had already produced a skeleton national network. Even so, the task of drawing the contours either required substantial manpower (if instrumental contours) or skilled surveyors (if sketched): where were these people to come from? It may be significant that the General Staff map was nearing completion – only Corsica remained to be done. Was the Interior Ministry bidding to take over the redundant surveyors – and their funding?

In the Third Republic, the best-laid plans were liable to founder at the next reshuffle. The Interior Minister in 1878 was Émile de Marcère. He was replaced in March 1879, and never returned. Between then and 1900 there were 27 changes of Minister. So even if Anthoine continued to plot a raid on Army funding, quite possibly none of de Marcère’s successors were interested – or were long enough in post to execute such plans.

Anthoine’s timetable was hopelessly optimistic. By 1881 just 81 sheets had been published. It would be interesting to know whether they had any depiction of relief. By 1888, the idea had been abandoned of not showing relief until contouring had been done; all sheets were hill-shaded, presumably based on the hachured depiction of the General staff map. It is not very effective, except insofar as it distinguishes mountainous areas from the hilly, and hilly areas from flat ones (figure 4). By 1888 publication was in the hands of Hachette. The price for flat sheets was 80c. Folded in a smart book-fold cover of red cloth, they cost

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9 There is little doubt that France would already have acknowledged a Bourbon king, had the legitimate claimant been willing to accept the *tricolour* as the national flag.
10 https://fr.wikipedia.org/wiki/Carte_d%E2%80%93Major
11 https://fr.wikipedia.org/wiki/Liste_des_ministres_fran%C3%A7ais_de_l%27Int%C3%A9rieur#Troisi%C3%A8me_R%C3%A9publique
12 *Notes on the Government Surveys of the Principal Countries*, HMSO, 1882.
Fig 4. Carte Vicinale – extract from XVI.26 of 1898

Fig 5. Extract from the Type 1900 showing peninsula south of Toulon harbour
Fig 6. Type 1900 characteristic sheet, showing marsh, turbaries, marshy meadow / rough pasture / meadow, with trees (1) and without (2) / arable [uncoloured] / hops, vines / orchards (inc. olives), gardens / parks / wood, scrub
1.05 Francs. Hachette seems to have done a good job of encouraging sales: the Carte Vicinale is encountered in second-hand bookshops far more often than the General Staff map, even though the latter in lithographed form could be had more cheaply.

As for levelling, the government did agree in 1878 to a major in-filling of Bourdaloué’s network, but this was entrusted, logically enough, to the Minister of Public Works, whose department included the Ponts et chaussées. The work was undertaken under Charles Lallemand and continued until 1922 – not exactly the sort of speed that Anthoine seems to have envisaged.

**France: birth and death of the Type 1900**

If the Ministry of War felt threatened by the Interior Ministry there are few immediate signs. On the other hand, Ministers had more important things to worry about. General Boulanger, who was Minister from January 1886 to May 1887, formed the view that he was called to be a successor to Napoleon; and then in 1894 came the Dreyfus Affair. Nevertheless, one thing was accomplished, namely the separation of the Dépôt de la Guerre into the Service Géographique de l’Armée (SGA) and a separate Service Historique de l’Armée. This was followed by the creation of the Type 1889 1:80,000 map, which was basically the old General Staff map divided into quarter-sheets. Real change only came in 1900, although the new Type 1900 launched in that year must have required several years of experiment.

It is striking that the new map addressed most of the criticisms of its predecessor made in 1878: for example, population figures appear: single track railways are distinguished from double-track, with a further symbol for quadruple-track; places with post or telegraph offices are marked (with telephone offices too); and relief is shown by contours as well as by the combined form of hill-shading (vertical + diagonal). Visually, it is stunning (figure 5), principally through the use of red for buildings and walled edges to roads. Use is made of three colours (green, blueish green, and purple) for different types of land use (figure 6).

Production and publication of the Type 1900 were slow and the priorities appear to have been driven by political considerations. The eastern frontier was covered by 1914, but also a block of sheets around Paris and sheets covering the major cities around the country. The requirement to cover militarily important areas seems to have been balanced against a desire to allow a high proportion of the electorate to obtain a new-style map of their local area. Whether it would take twenty years or a hundred to cover the rest of France may well have been seen as unimportant. Then came the First World War.

One of its effects was that the Army was seen as the saviour of the nation; another was that the SGA seems to have had more of a voice at the highest level than before or since. It is striking that one of the clauses in the Treaty of Versailles was that Germany was to pass the reprographic material for the maps of Alsace

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13 Based on stamped prices seen inside the cover. Prices initially seem to have been 5c lower.
and Lorraine to France.\textsuperscript{14} The regained provinces were certainly a major challenge for the SGA: there was a need for maps and (even if the German plates were used briefly \textsuperscript{15}) they needed to be \textit{French} maps. They must also have been needed in large numbers, which made production of Type 1900 maps of the area impossible. In consequence, a Provisional Edition was produced in black, brown, blue and green (\textit{figure 7}). It is an interesting exercise to compare \textit{figure 7} with \textit{figure 1}. The map has been redrawn, but the detail is much the same; the names are largely the same, with translation: thus \textit{Baseler Vorstadt} becomes \textit{Faubourg de Bâle}, etc. And there can be no doubt whatsoever that the contours on the Provisional edition are copied from the German 1:25k. This perhaps explains why the marginalia are unusually coy about the source of data.\textsuperscript{16}

In 1922 it was decided to discontinue the Type 1900 and that new maps should be of a new Type, broadly similar to the Provisional edition, albeit with a greater density of names. The change has been explained as resulting from the expense of printing the Type 1900.\textsuperscript{17} Undoubtedly the French Army in general, and therefore the SGA in particular, was under pressure to economise. But one can argue that it had come to realise that the Type 1900 was often illegible. For example, the reader may care to inspect the island (or rather peninsular) to the south of the harbour on \textit{figure 5} and attempt to mark in all the vineyards. He will find it a difficult task, because vigneron do tend to lay out vineyards on south-facing slopes where there is already purple-grey hill-shading. The answer is indicated in \textit{figure 8}, which uses a later convention in which vines are indicated by green dots along with broken diagonal black lines. Vines are not just of interest to the economic geographer but are of tactical importance, presenting a barrier to cavalry but not to infantry. A more serious problem was that it proved difficult to balance the intensity of the green used for woods against that used for meadows and other vegetation types. Type 1900 sheets can be found where meadows are almost as prominent as woods; other cases are like \textit{figure 7} where the vineyards north of the city and around the Faubourg de Bâle (diagonal broken lines in green) are barely discernible. It would be wrong to pretend that the Type 1922 solved this problem immediately. It gradually progressed to the system seen on \textit{figure 8} and even that had its problems; but problems in a map limited to four printings are more easily tolerated than in one as complex as the Type 1900.

Whereas the Type 1900 had used red for buildings, the Type 1922 changed this to black. This was liable to cause problems in great cities, where names in black previously stood out against the red but now might be lost. The red printing was therefore retained for sheets covering major cities, including the block of nine sheets centred on Paris. \textit{Figure 9} provides an example. The cynical

\textsuperscript{14} \textit{Das Reichsamt für Landesaufnahme und seine Kartenwerke}, (Berlin,1931), 174 (available online)

\textsuperscript{15} I am not aware of any specimens.

\textsuperscript{16} By 1967, at least one sheet (XXXIV-13) acknowledged use of German material. I am indebted to the Exeter Geog Dept catalogue for this.

\textsuperscript{17} AR Hinks, \textit{Maps and Survey}, 1942, 94.
may observe that the extent of built-up area on this sheet is not so extensive that printing in black was really precluded; perhaps the same political motives that caused Paris and the great cities to receive early treatment in the Type 1900 now acted to give them maps of almost equivalent splendour. There would clearly be problems if anyone wanted to mount these maps alongside neighbouring sheets of the ordinary Type 1922; since in most cases the neighbouring sheets were Type 1889 on different sheet lines, this was a problem that could be ignored for the time being.

**France: the end of the Carte Vicinale**

Regular updating had been proclaimed as one of the virtues of the Carte Vicinale. One can find copies that have been bought as much as nine years after they were printed; one the other hand, revision and reprinting seems usually to have taken place at intervals of no more than fifteen years. Comparison of successive editions suggests that revision showed new population figures and updated post & telegraph facilities and railways – all matters that could probably be dealt with from Paris. Changes to roads seem infrequent. This is despite a broken-line variant of symbols to indicate roads *en lacune*. It would seem that the term should be understood as ‘in the programme’ rather than ‘under construction’, otherwise construction was taking an awfully long time.

After the war, there was a requirement to extend coverage to Alsace and Lorraine. This must have created problems for an organisation which lacked proper surveyors. Perhaps the new maps were based simply on reductions of the SGA’s Provisional Editions. If so, it will have helped prepare the ground for the SGA’s coup in 1922 by which it took over full responsibility for the Carte Vicinale. Henceforth the country had only one official map producer.

Curiously, the plates of the Carte Vicinale remained unchanged for a couple of years: perhaps nothing could be done until the contract with Hachette expired. What does change is the blind-stamp (though scarcely anyone can have noticed this). Instead of referring to the ‘Carte de France’ it now describes the product as the *carte dite de l’Interieur*, an odd expression – it is difficult to imagine that anyone actually referred to the map in this way. From 1925, the SGA appears on the map as its publisher in place of Hachette. From 1925 too, one usually finds ‘partial revision’ which seems to amount to the updating of population figures and nothing else.

The Carte Vicinale staggered on until the Second World War. It presumably filled a useful gap in those large parts of the country where the SGA’s own product was still the unappealing Type 1889, even though this might have been updated more recently than the Carte Vicinale.
UK

The Ordnance Survey rather tentatively launched a coloured lithographed version of the Revised New Series in 1897, which was well received.\(^\text{18}\) It went on to produce a coloured version of the Third Edition, and by 1914 almost the whole country was available in this style.

In parallel to this, another style was being developed, the ‘Coloured Outline’ or ‘Contoured Road Map’. Close had a hand in this while heading the Geographical Section at the War Office.\(^\text{19}\) On moving to Southampton as Director-General, Close also experimented with a more elaborate style of coloured map inspired by the French Type 1900, producing various isolated sheets of which the Killarney one is the most famous. Then came the First World War; at the end of this, a new one-inch series was needed and the ‘Contoured Road Map’ style was adopted.\(^\text{20}\) Public demand for maps had been greatly expanded by the exposure to maps so many had received during the war; for those serving in France, the main small-scale maps they will have used will have been GSGS 2364 and 2733 in the ‘contoured road map style’. So in a sense Close’s activities at the War Office had prevailed over his grander ideas at Southampton – though of course cost and the available resources played a massive part.

I have skated very quickly over the UK story, because it is well known to most readers and full accounts are readily accessible.

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**Assessment**

Superficially, one might say that Germany was less advanced than the UK, whilst France was more advanced. Such a statement supposes a preordained sequence of development, which all countries followed but at differing speeds. In fact, countries (or groups of countries) have proceeded along different lines. In particular, official topographic maps in the German-speaking world (Switzerland, as well as Austria and Germany) long adhered to a style closely derived from the engraved map but separated into black, brown and blue plates.\(^{21}\) Latterly, road fill has been offered, but often by means of a separate overprint, maps being available with and without this option. In the case of Germany, it must have been convenient that this general approach gave the ability to revert to a monochrome lithographed product when under financial or other pressure, but that hardly affected Switzerland. And all these countries have sought to enhance the black+brown+blue design by the subtle application of hill-shading. What all these countries have in common is alpine terrain, whose representation presents a particular challenge to cartographers.

In the UK, the Ordnance Survey was trying to achieve sales to a wider public. That wider public was interested in maps as means of getting about; they did not share the geographers’ interest in maps as an aid to the appreciation of landforms. Take, for example, the Ellis Martin family group on the cover of ‘Country Round London’. Two men are poring over a map; a cyclist has stopped to give advice; a lady stands up in the back of the car, shielding her eyes against the sun: what is she saying? (This would almost make a caption competition.) “I _do_ think that is a glacial moraine over there” is the sort of entry that might win such a competition for its sheer absurdity: of course the question under discussion is “Do we turn left or right?”. So, whilst the Ordnance Survey listened politely to the likes of AR Hinks\(^2^{22}\) (and even tried to follow his suggestions, where possible), right from 1897 coloured fill for the better sort of road was seen as absolutely essential.

This difference in expectations is brought out by the British Army’s version of KDR-100, GSGS 2739, which adds a brown fill to roads, perhaps in part as a compensation for the poor reproduction of the black detail. There is an even better example at the 200,000 scale, where CUL Maps 257.90 is a partial set of KDR-200 with red fill for main roads, blue water, and green woods, said to have been produced in Paris but looking like a WW1 British product. By a strange quirk, the 1:300k Übersichtskarte is similar in style to GSGS 2739, as though the German and British armies were actually quite close in their cartographic aspirations.

As for France, there is no denying that the Type 1900 was highly innovative and provided a depiction of relief that the geographers greatly admired. For tactical use by the Army, it was so superior to the map it replaced that perhaps

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21 One might cite the 1:10k of the Zugspitze printed 1892, with contours in brown and glaciers (?hand-coloured) in blue, as evidence that the Bavarian survey was in no way backward. A facsimile of this map was issued in A Habermeyer, _Die Topographische Landesaufnahme von Bayern im Wandel der Zeit_, (Stuttgart, 1993).

22 Secretary to the RGS. See RC Wheeler, ‘OS maps as they might be’ _Sheetlines_, 48, 64.
no one was inclined to criticise it. Likewise, if the man in the street saw a copy, he would doubtless consider it quite splendid. Did he go out and buy it? I have never seen any sales figures. As noted, the Type 1900 was something of a dead end.

The Carte Vicinale was highly innovative too. Even if we regard the Interior Ministry as equivalent to Bartholomew – despite being part of government it was not the official cartographer – it can still claim priority for producing the first decent topographic map of a large country that made full use of the possibilities of colour-printing. If only Anthoine’s ambition to produce a contoured road map had been achieved, perhaps French cartography might have followed an entirely different course. In the event, the Carte Vicinale was also to prove a dead end.

The consequence was that by 1972, half a century after the launch (or re-launch) of the flagship product of official French cartography, the Type 1922 was looking tired and was still incomplete. It would be interesting to know who bought it, other than academic geographers. The motoring public bought the Michelin 1:200k. (The cartographic revolution brought about by the IGN in the years that followed would make a fascinating account but this is not the place to tell it, nor am I the person to do so.)

What, then, should we make of the Close experiments with the ‘fully coloured’ one-inch? Perhaps the most telling point was that they remained experiments. Close was evidently pushing them for all he was worth; and the sheer number of experimental sheets either indicates unusual caution on Close’s part or – perhaps more plausibly – that his response to failure to obtain authorisation for a new series was to keep the programme going with yet another trial sheet. Without doubt, Close’s enthusiasm was misplaced: the Army seems not to have wanted his Fully Coloured style; and the public (as shown by the later history of the 5th Edition) did not care for it either. He was paying too much attention to the geographers.

Thus, in the end, the Contoured Road Map prevailed. Red main roads – a particular dislike of the geographers – are about to celebrate the centenary of their appearance en masse and are still going strong. Close’s real achievement was the Popular Edition. To his predecessors belongs the credit for the UK (bar the Western Isles) being covered in 1914 by a coloured map that met public needs and commanded a measure of public affection. In that respect, the Ordnance Survey was decades ahead of its neighbours.

One final observation: the politics surrounding official cartography in the UK seem to have been remarkably trouble-free in this era, compared to both France and Germany.

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23 The Aldershot experimental sheets can be interpreted either as a sales pitch to a potential customer or as reflecting a measure of enthusiasm in certain quarters at the Aldershot Command; but the outcome seems to have been negative so far as the fully coloured style was concerned.
OpenTiles.org is an online project to stitch historical map sheets into continuous layers, and to present them online as a zoomable tileset. Others are doing similar work, some commercially, but OpenTiles is designed to drive down the cost of preparing the sheets and hosting the huge data volumes involved. The intention is to make the layers free at the point of use.

OpenTiles.org is already offering the Soviet Genshtab sheets at scales of 1:25,000 to 1:1 million – some 130,000 sheets stitched together. Other interesting series include Austria-Hungary in 1910, pre-war Latvia and Allied maps of Germany.

Much of the potential value of historical maps cannot be realised because of the difficulty in comparing them with the present-day or with each other. Projections and scales differ, scans are distorted and their organisation into discrete sheets impedes the user experience of margin-free zooming and panning of a multi-sheet map series. Yet high-quality scans of historical maps continue to pour online. Funded by public foundations and private donations, and motivated by educational objectives, there is now a wealth of free historical resources available. Some sources are well catalogued; others rely on users to do their own discovery. But they are usually hard work for the end-user.

Stitching sheets together into a seamless map is not new. As a child, I used paper-clips and adhesive tape. Online out-of-copyright OS maps have long been available from several sites and the National Library of Scotland is a more recent – and more functional – provider. They show the way, but are only scratching the surface of what needs doing internationally.

The tools to stitch maps exist and are maturing. The most generic offering is commercial, from Klokan Technologies, and is deployed by the NLS, British Library, David Rumsey Maps and others. Its approach is to rely on human calibration to precede a process of re-projecting and de-collaring the sheet, with quality achieved by either using skilled technicians or crowd-sourcing multiple attempts. It works well, no matter the cartographic standards of the image, but is inevitably slow.

Work began on OpenTiles.org in late-2016. Firstly, it aims to use automated techniques, similar to number-plate or facial recognition systems, to identify the collar on a map sheet. Such computer vision is imperfect but helps to make processing of large sets, such as the 40,000 Soviet Genshtab 1:50,000 series, possible. Secondly, it has built the computer hardware from basic components, in order to drive down the cost of a multi-terabyte dataset to an acceptable level.

Open-source software has been used throughout. Free software is still good software, and doesn’t come burdened with onerous restrictions on adapting it.

1 Matthew Shaw is a software hobbyist, with an interest in historical cartography. He can be contacted at shawmat.sl6@gmail.com.
Collar detection and reprojection

The challenge is to take a map image, detect and remove the collar (margins) and re-project it to WGS84. In tests, automated collar detection using the Open Computer Vision algorithms with Python achieved a 98.5% success rate. Typical errors arise where the border is unclear, due to poor scan quality or user markings, and it cannot handle map irregularities such as insets and extrusions.

The OS Ireland map of Drogheda (below) illustrates automated border detection using Open-CV’s Contour algorithm, shown in green, and the use of diagonals to find the corners of that perimeter (shown in red). The algorithm detects hundreds of contiguous areas, but the largest area is usually the one we want – as formed by the sheet border. One error here is caused by some text bleeding into the border lower-left. Nevertheless, the result is ‘good enough’ for a first pass.

A Python library then helps to re-project the OS Ireland grid to WGS84. The black area is actually transparent, which means that adjacent sheets show through when viewed together, irrespective of the order they are applied.

The map bounds of each sheet are required as input. In this case, the calibration is by reference to the OS Ireland grid, and it may be necessary to know the date of the sheet to apply the correct version when converting to WGS84. Other map series are often easy to calibrate, so long as the sheet naming conventions are understood. Nevertheless, map bounds in latitude-longitude still need to be transformed to the WGS84 datum, and the original datum may not be obvious.
**Online presentation**

Raster maps are presented online after conversion into a ‘tile pyramid’. Each zoom level is a layer of the pyramid, and each level is made up of tiles of 256x256 pixels. Tiles are typically stored as binary records in a database rather than the JPEG or PNG file that the browser receives, because millions of separate files are exceptionally difficult to manage. The web-server must query the database for the required records and render them as files in milliseconds. Mapbox.com has been instrumental in driving the standards for online tile serving. But the compliant open-source tools fall short when scaling up to the 40 million+ tiles already available on OpenTiles.org. Many enhancements to the established tile-making tools have become necessary. The task of building a large pyramid is now subdivided in order for it to be executable, and this has the added benefit of being able to handle partial refreshes as new sheets are found or individual detection errors are corrected. The web-server has been extended to enable new layers to be added without restarting it, and the database indexing redesigned to support multi-million tile pyramids. The database is already several terabytes in size.

**Hardware**

‘Storage is cheap’ we are often told. But hosting a multi-terabyte database stresses this assertion – and many hosting companies have upper limits of just 2Tb. OpenTiles.org recognised that building its own infrastructure from off-the-shelf components was the best way to achieve a solution that could scale indefinitely. Cost per Tb is under 10% that of the cheapest hosting company and 17Tb is already installed. Hosting the raw files, processing and tile pyramids together vastly simplifies the logistics. Fibre-optic (to the premises) broadband delivers adequate upload speeds for the web server, at least for the near-term traffic levels.

**Futures**

OpenTiles.org as a project has lots of raw material and a maturing processing capability. Automated collar detection is still work-in-progress, and the layers online today still have their collars in place. The Allied maps of Germany 1:25,000 have unusually large collars, which means the geolocation errors are considerable. But the tile-making processes work well and a scalable infrastructure is in place.

There are several areas where additional practical contributions are sought. The author has taken the project to its current place almost single-handed, but it needs to transition to be a collaborative open-source project. People can help in several ways but these are the main perceived gaps:

1. The project would benefit from more cartographic knowledge. Applying the correct re-projections, and assembling the code libraries necessary, needs improvement. Users will expect the quality of the layers to improve over time from the ‘good first attempt’;
2. A good Javascript developer would help increase the value of the results but also help with crowd-sourced engagement;
3. Setting up a steering committee of people familiar with the world of open-source, map librarianship, application of cartographic information would be a real bonus.

Oh, and more raw material is always welcome.
Readers may recall a little bit of a dispute some years ago between Ordnance Survey and the Automobile Association.

It all revolved around OS accusing AA of infringing copyright. AA insisted that they had their own cartographic department and that they did not, and never had, used OS material or data in producing their motoring maps, atlases and route directions.

One of the leaders of the OS team in the dispute was Carl Calvert, at that time OS’s IPT Consultant. Carl and I were members of a small group of OS staff who had been trained in Expert Witness procedures to represent OS in the civil and criminal courts. Consequently, he and I were in regular discussions over the expert reports that we were composing in a system of “peer review” of the drafts of our reports. During one such conversation Carl mentioned the OS/AA case and said that AA were sticking to their claims of no use of OS data in their mapping.

The conversation then went something like this:

Me: “Carl, I picked up an old map in a junk shop the other day. It’s an AA map published in 1934 of Central London showing theatres, garages, parking places, one-way streets and roundabouts”.

Carl: “Very interesting, but why are you telling me?”

Me: “Well, in the bottom left corner in very small print is the wording, “CROWN COPYRIGHT RESERVED”.

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1 The author was at the time OS Chief Surveyor in Leicester.
Carl: “Great. Can you please send me the map?”.  
Me: “On one condition. When you have finished with it I want the original map back please”.  

In due course, when the legal proceedings had been concluded, with a reported £20 million having been paid in historic royalties by AA,² I received my original map back with this note from Carl.

² https://www.theguardian.com/uk/2001/mar/06/andrewclark
Is there an optimum size for topographic maps?

Richard Oliver

In 1993 Chris Board published an article on ‘Neglected aspects of map design’. These included sheet layouts, covers and folding, but made only passing reference to one concern of this article: the percentage of paper on which topographic maps are printed that is taken up with the actual area of the map, as opposed to marginalia – or just blank paper. The other concern is whether there is an optimum size for topographic maps.

This article is purely concerned with paper maps: the disadvantage of a relatively limited area of mapping that can be viewed satisfactorily at once on mobile devices is offset by the virtually unlimited scope both for extent of mapping and extent of any necessary explanation and guidance. For many users, this writer included, paper mapping has a basic functionality, of the ability to take in at a single view a large area at a high resolution that, by the very nature of the compactness of mobile devices, no ‘app’, however sophisticated, can have. Further, paper maps do not depend on an electricity supply for viewing.

‘Map efficiency’

One way in which the ‘efficiency’ of a map can be assessed is the ‘cartographic design’: its ability to convey to a reader the information in lines, points, areas and text that has been encoded into it. Another, the subject of this article, is the amount of information about the area depicted, as encoded within the neat line, as compared with explanatory matter: the percentage of the paper that is occupied by the map proper as opposed to borders and marginalia.

For any particular map series, given that the symbol set and standard footnotes, etc, are unchanged, the larger the sheet of paper used the greater is the advantage to the map-user, as a higher percentage of the paper is used for the map proper. Let it be assumed that a 1-cm border is used, and that a further 0.5-1.0 cm is needed as a handling edge. An A1 sheet is 85 × 58 cm (4872 sq cm): a map of 80 × 50 cm (4000 sq cm) inside the neat line occupies 82.1 per cent of the paper. This leaves 2 cm each to left and right, 3 cm at the top and 5 cm at the bottom, or 2 cm at the top for series and sheet name and number, and 4 cm at the bottom for legend, scale bars, grid-box, metadata and any other needed marginalia. On an A0 sheet of 116 × 84 cm a size of 112 × 76 cm (8512 sq cm) within the neat line is possible, with an increase of about 38 per cent in the space available for legends, etc: even so, the actual map area occupies 87.4 per cent of

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2 In what follows dimensions are horizontal preceding vertical, and are quoted to the nearest 0.1 centimetre, with areas to the nearest square centimetre. Map areas have been obtained as far as possible from the nominal dimensions, in order to circumvent problems of distortion after printing. Percentages are given to the nearest 0.1 per cent. Data has been obtained from maps accessible to the writer in Exeter.

3 ‘Legend’ is here defined as what on some mapping, eg the one-inch Fifth Edition, is the ‘Reference’, ie the guide to symbols and conventions. It is not here taken to include the guide to referencing.
the paper. Conversely, on A2 paper, $58 \times 42$ cm (2436 sq cm), a map area of $54 \times 34$ cm (1836 sq cm) gives a figure of 75.4 per cent.

Total efficiency is achieved if the map covers 100 per cent of the paper. This implies a double-sided map with no margins, legend, metadata, scale or sheet numbers or other identifiers, though if the map carries a metric grid the scale might be implied by grid figures on the map face. In practice this does not happen: double-sided mapping is still the exception, and legends and other marginalia continue to be provided. Although double-sided mapping can offer much better value for money, there is the disadvantage that reversing it is impracticable in a car and can be awkward out of doors, quite apart from the increased wear on the folds. The apparent success of double-sided publication with the OS 1:25,000 Explorers is probably due to an effective monopoly.

An example of a map with minimum marginalia is the Cassini Carte de France, of which publication began in 1756: the sheets as first published have only a sheet number, scale bar and corner co-ordinates, and the map area occupies about 80 per cent of the total area of the paper. The individual sheets of the OS 1:2500 first edition of 1855-70, when publication was by parishes, have only parish names, sheet number and scale bars, but in most instances are supplemented by separate title sheets which include the date of publication and the name of the Royal Engineer divisional officer supervising the work. Later 1:2500 mapping tends to have a comparatively good percentage of map area to total paper: Berkshire/Wiltshire sheet 19.9/17.9 of 1880 has a map area of 96.6 × 64.4 cm (6221 sq cm) and a total printed area of 99.3 × 68.8 cm (6832 sq cm), on paper $106.2 \times 71.8$ cm (7625 sq cm), giving 81.6 per cent of paper covered by the map, and 89.6 of paper covered by the total printed surface; a copy of Bedfordshire sheet 33.5, published in 1924 but printed after 1954, has a printed area $101.5 \times 71.2$ cm (7227 sq cm) on paper measuring $104.6 \times 73.8$ cm (7719 sq cm), giving 80.6 per cent of paper covered by actual mapping.

Given that it is necessary in practice to symbolise some information on maps, especially smaller-scale maps, the optimum symbols are those that are self-explanatory. This perhaps explains the lack of legends on many ‘early maps’. Instead there is pictorial suggestion: thus on the OS one-inch Old Series, of which

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4 The title information, particularly on early (1855-60) issues, is sometimes printed in a blank area falling outside the parish. Kingswear parish, published on Devon 128.13 in 1865, was unusual, if not unique, in that the whole parish fell within a single 1:2500 sheet, which included the title. This title-sheet has received a wider circulation than most, as part of it is reproduced on a foldout at the back of CR Potts, The Newton Abbot to Kingswear Railway (1844-1988), Headington: Oakwood Press, 1988.

5 The paper sizes used for large-scale maps were fairly but not absolutely standard, and there were minor variations across the decades: thus for example six-inch Devon 93 SW was printed in 1892 on paper $58.4 \times 44.9$ cm, whereas in 1951 Devon 80 NE was printed on paper $57.2 \times 42.7$ cm. The standard sizes within the neat lines for OS County Series mapping were $36.0 \times 24.0$ inches (91.5 × 61.0 cm; 5582 sq cm) for 1:1056 (five-foot) and 1:10,560 (six-inch) full sheets, $18.0 \times 12.0$ inches (45.7 × 30.5 cm: 1394 sq cm) for 1:10,560 quarter-sheets, and $38.016 \times 25.344$ inches (96.6 × 64.4 cm: 6221 sq cm) for 1:500, 1:1250 and 1:2500 sheets. (An indicator of a post-1954 printing of a County Series sheet is a printed price of 10/-).
publication began in 1805, agglomerations of tree-symbols suggest woodland, ‘tufts’ suggest rough-surfaced, uncultivated ground, and close dotting or speckling suggest sandy areas. Legends were included on the county index sheets to the Irish six-inch (1:10,560) from its beginning in 1833, but only reached the one-inch in 1886, and then only on newly-published sheets and to explain symbols such as roads, boundaries and other varieties of line that were not necessarily obvious in meaning. In 1894 this was expanded to include further non-pictorial symbols introduced at the behest of the Baker Committee, which had reviewed military mapping of Britain in 1892. Woods only start to be explained on coloured one-inch maps in 1901, and other land-cover on the one-inch in 1914. Bartholomew likewise only explained some of their symbols – initially mostly the road classification – on their half-inch (1:126,720) series, and even on their 1:100,000 published from 1975 the cross for church was omitted from the legend.

Another way is to assume that either (a) symbols for a multi-map national series should be something that is ‘part of everyone’s education’, or (b) provide a separate symbols card. These were provided for, amongst others, GSGS 3907 and 3908 (the one-inch of Great Britain) and GSGS 4069 (the 1:500,000 air map of Great Britain) during World War II. A card was also produced for the post-war civil 1:25,000 Provisional Edition.

A complication arose from 1914: reference systems and grids came into general use, which needed both to be figured in the margin and their working explained to the map-user. This increased demand on paper and therefore in principle reduced the amount available for actual mapping.

Maps can be divided into two broad categories: those usually supplied folded with a cover of some sort, and those supplied flat. Most ‘consumer’ mapping is of the first sort: large-scale cadastral-type mapping and military mapping are invariably of the second sort. The usual way, at any rate in Britain, is to provide a separate cover; an alternative is an envelope or plastic sleeve. The other method is an integral cover: this can be either printed as effectively a part of the printed area that includes the map, or it can be printed on the reverse. This in turn is related to folding. Nowadays most maps use a fold which appears to have been invented nearly simultaneously in several European countries in the mid-1930s, and is known in Britain as the Bender fold: this is the fold familiar from the British and Irish 1:50,000 series, and has the advantage that any part of the map can be examined without opening more than four panels at once. It also has the advantage that a suitably-sized flat sheet can be Bender-folded $8 \times 4$ using binary folds, or hand-folded in a more sophisticated way using marginal marks.\footnote{An example of this is a note on GSGS 5070, BAOR Road Map, 1:500,000, Edition 4, 1975: ‘TO FOLD ROAD MAP FOR USE IN VEHICLE (Folding points are shown by red diamonds in the margin) Fold top and bottom edges horizontally to meet at the centre, map facing outwards. Then fold the map vertically into eight equal parts in concertina fashion so that Legend box faces outward. Finally fold the map horizontally in half with Legend outwards. Any part of...}

\footnote{Report of Committee on a military map of the United Kingdom, unpublished, printed at War Office, 1892 [A.237]. There is a copy in the Royal Geographical Society at Z.72/4 and another at p.639 in The National Archives (TNA) WO 33/52.}
Excess baggage? The Popular and the Landranger compared

What happens in practice can be illustrated by reference to two well-known series: the one-inch (1:63,360) Popular Edition of England and Wales, and the 1:50,000 Landranger series of Great Britain. As designed, both were intended to be issued both paper-flat and folded in covers. A folded copy of Popular Edition sheet 40, as issued on publication in 1923, has a map area of 68.6 × 45.7 centimetres (27.0 × 18.0 inches: 3135 sq cm), a total printed area of 71.8 × 52.6 cm (3777 sq cm), and a total paper area of 77.5 × 53.0 cm (4108 sq cm); the map area occupies 76.3 per cent of the total area of paper and 83.0 per cent of the printed area, and the printed area occupies 91.9 per cent of the paper: there are notably blank areas in the left and right margins. By later standards the method of folding used is unlikely to be judged convenient. Landranger sheet 113 of 2016 has a map area of 80.0 × 80.0 cm (6400 sq cm), a total printed area of 97.2 × 86.6 cm (8418 sq cm) and a total paper area of 89.0 × 100.0 cm (8900 sq cm): the map proper occupies 71.9 per cent of the total area of paper and 76.0 per cent of the total printed surface, which in turn occupies 94.6 per cent of the total paper area. The user of the Popular Edition is therefore carrying 23.7 per cent, or nearly one quarter, of paper that either explains the other 76.3 per cent, or else does nothing at all. The user of the Landranger, 90-odd years later, does worse: 28.1 per cent of the ‘map’ is not mapping anything. Both maps have separately printed covers: up to about 1930 the Popular was issued with thin covers pasted directly onto the back of the map, and thereafter with hinged card covers, which continue to be used on the Landranger. If the hinged covers are taken into consideration, then the 1938 issue of Popular sheet 40 has a mapped area of 63.0 per cent of cover and paper combined, compared with 66.7 per cent for the

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8 The Popular Edition of Scotland included a minimum one-inch overlap onto adjoining sheets, and so the standard size was 28.0 × 19.0 inches. The Popular Edition of England and Wales is studied thoroughly in Yolande Hodson, Popular maps, London: Charles Close Society, 1999, but the Landranger still awaits even an outline study, which would be useful despite the series showing no signs of demise. As far as practicable the Landranger is described in terms of current practice.

9 It should be noted that Popular Edition sheets, like other OS small-scale maps, that were to be folded were trimmed before covers were added, and so a paper-flat sheet would have a rather higher ‘inefficient’ percentage. Paper-flat issues of the Landranger, before these were discontinued other than for print-on-demand issues, were always the same as for folded sheets.

10 As was usual on coastal sheets of the Popular Edition, the magnetic variation is inside the neat line, in a sea area: the printed area on an inland sheet would be about 72.5 cm left to right, or a total printed area of 3813.5 sq cm. This does not affect the percentage of paper occupied by the map in relation to the sheet of paper as a whole.

11 Landrangers covering areas to which the Welsh Language Act applies have been issued with an additional Welsh legend on paper 112.5 × 89 cm: the map proper occupies 63.9 per cent of the paper.
In other words, unless drastic cropping is resorted to by the user, about a third of the ‘map’ carried is not mapping at all.

**Are there more ‘paper-efficient’ maps?**

Carrying about rather more paper than is strictly necessary is both a burden on the traveller, and an unnecessary extravagance in the use of paper and the resources needed to produce it. Before enquiring into why this is so for the Popular Edition and the *Landranger*, it is worth considering some other maps which appear to offer rather more map for area of paper.\(^{13}\)

Amongst the most efficient must be the Institut Géographique National’s 1:100,000 *Carte de France*: an integral cover, a compact legend and ‘bleeding edges’ contribute to the map covering 93.3 per cent, and the printed area 100 per cent, of the paper. These are large sheets – paper 122.0 × 89.2 cm – but a result nearly equal is obtained by Croydecycle, despite a standard paper size of B3 (50.0 × 35.5 cm: 1775 sq cm), by printing back-to-back: their 1:100,000 *Exmoor & Taunton*, which uses bleed edges and as far as possible eliminates ‘redundant’ sea areas by using them for ‘marginalia’ and supplementary town plans, achieves 91.2 per cent of paper used for ‘real mapping’. Croydecycle’s walking maps, usually at 1:12,500, are similarly compact, but IGN’s 1:25,000 series is more typical of the average: despite a ‘bleed’ integral cover, the map area occupies no more than about 64-65 per cent of the total paper and print areas.\(^{14}\)

Some early twentieth century OS mapping is also quite efficient, at any rate if the rather bulky covers are overlooked: half-inch (1:126,720) sheet 14 of 1908 has a map area and a printed area covering respectively 82.3 and 87.1 per cent of total paper area, and the one-inch Third Edition Large Sheet Series 39 of 1908, has a map area occupying 83.9 per cent of paper area. These both have a map area the same as for the Popular Edition: 68.6 × 45.7 cm. Even Third Edition coloured small sheet series sheet 42 of 1907, handicapped by including the same marginalia as the Large Sheet Series sheets that quickly superseded it, but with a map area of less than half – 45.7 × 30.4 cm – has a map area of 73.8 per cent of the paper. Both the small- and the large-sheet versions of the coloured one-inch Third Edition have incomplete legends, showing no more than 25 symbols if

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\(^{12}\) In 1923 the standard-sized Popular Edition sheets, such as 40, were folded 8 × 3; in 1930 or 1931 a 7 × 3 fold was adopted with the introduction of hinged covers, and the area to which the paper was trimmed was altered. The 1938 issue of Popular sheet 40 has a paper size of 75.8 × 60.2 (4563 sq cm) and two hinged covers, each 10.9 × 19.0 cm (414 sq cm). The 1:50,000, as first issued in 1974 – before it was titled *Landranger* – had a printed area of 96.9 × 85.0 cm (8737 sq cm), or 92.5 per cent of total paper area.

\(^{13}\) Weight of paper is not discussed here, as in principle any map can be printed on any suitable paper with any backing or surface treatment to render it more robust. The ‘efficiency’ applies equally comparing a one-inch Popular Edition printed on Place’s waterproof paper with a laminated ‘OS Active’ *Landranger*.

\(^{14}\) This series is on graticule sheet lines, so the width of the sheets decreases gradually from south to north. Sheet 0715-O, one of the more northerly sheets, printed in 2009, has a map area of 53.1 × 80.0 cm (4248 sq cm) and a total paper area of 99.1 × 67.1 cm (6650 sq cm).
unfenced roads are excluded. This is only partly due to not including certain classifications, notably of roads, used on the Popular Edition. It would have been possible to include a more comprehensive legend on the standard landscape-shaped Large sheets without increasing the printed area, but not on the portrait-shaped ones, and this applies also to the Popular Edition.

The OS’s first use of the Bender fold was on the one-inch New Forest sheet of 1938, which incorporates many of the features intended for a new standard one-inch series on metric grid lines that eventually emerged as the New Popular Edition. There is a striking contrast in ‘paper efficiency’ between the flat and folded versions of this map. The flat version has a map area 64.7 × 72.6 cm (4697 sq cm), and a printed area of 67.8 × 80.0 cm (5424 sq cm) on paper 76.7 × 93.7 cm (7187 sq cm): the map and the total printed area occupy 65.7 and 75.5 per cent respectively of the total paper area. For sheets issued folded drastic trimming was resorted to: the headings at the top of the map, which were effectively duplicated by the cover, were cropped completely, leaving map area and printed area occupying respectively 84.8 and 96.0 per cent of the remaining paper, though it must be admitted that the map area is 78.5 per cent of the combined area of paper and cover. The untrimmed paper size can presumably be explained by the use of an existing stock size: the New Popular Edition, produced from 1940 onwards, was more economical, with a standard flat paper size of around 69.5 × 83.3 cm (5789 sq cm).

The earliest use by the OS of an integral cover on a ‘standard series’ published map was on 1:25,000 sheet 856, issued in 1960. Folded copies are folded 9 × 6: the leftmost column of panels is occupied by the cover in the lower half and is blank in the upper half. These areas were cropped from copies issued flat. The total map area is 80 × 60 cm (4800 sq cm), on paper 101.0 x 76.3 cm (7706 sq cm): this gives an effective map area of no more than 63.0 per cent, similar to later folded issues of the one-inch Popular Edition. The post-1980 issues of the 1:25,000 Second Series, Pathfinder, also with an integral cover, have a mapped area of 68.0 per cent. Integral covers were tried on some Landranger sheets in 1979-84, but proved unsatisfactory for some reason that does not appear to have been publicised. Integral covers were used by the Ordnance Survey of Northern Ireland for their analogue 1:50,000 First Series, starting in 1978, but hinged covers were adopted for the digital Discoverer series, begun in 1998. As a result the mapped area of paper dropped from 71.5 per cent to 67.2 per cent, if the card cover is included, though the proportions were practically unchanged if the cover is excluded. The Ordnance Survey of Ireland have always used integral covers on their digital 1:50,000 series: the first, ‘Preliminary Edition’, sheet, 78, produced in

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15 The count rises to 28 on coastal sheets, where the legend includes the symbols for lighthouse, lightship and beacon.

16 Note, ‘1:50,000 integral covers’, Sheetlines 14 (1985), 20; note, ‘1:50,000 paper covers’, Sheetlines 44 (1995), 61: the latter lists 11 sheets (40, 65, 103 (two versions), 119, 125, 132, 142, 150, 186, 197, 204). The writer’s reaction at the time was that the integral covers looked ‘cheese-paring’ and ‘cheap’, quite apart from any questions of functionality.
1988, has a ‘paper efficiency’ of 72.3 per cent, but the standard series, published from 1993, only achieves 63.9 per cent.

At the other extreme are those maps which, for one reason and another, have a very poor ‘paper efficiency’. This is sometimes due to the use of standard paper sizes. That favoured by the OS for one-inch ‘small sheets’ or ‘quarter sheets’ printed from copper was about 61.8 x 46.2 cm (2855 sq cm): a standard one-inch New Series sheet measured 45.7 x 30.5 cm (1394 sq cm), giving a map occupying no more than 48.8 per cent of the paper, and it was left to map sellers to truncate the margins when preparing the maps for sale folded. One reason for such an excess of paper was the need to provide handling edges for printing from copper, though this is certainly not the only explanation.\(^{17}\) Mapping on graticule sheet lines produced in the Federal Republic of Germany in the 1980s is nearly as ‘inefficient’: 1:50,000 sheet L1922 of 1983 has a map area of 43.7 x 44.3 cm (1936 sq cm), 47.3 per cent of the total paper area and 53.1 per cent of the total printed area. A large part of the ‘marginalia’ is a trilingual legend.

It is worth noting that the usual OS practice after 1945 well into the 1960s was to use Quad Crown size presses for a variety of small-scale maps. The maximum paper size possible was about 45 x 33.5 inches (114.3 x 85.1 cm): the one-inch Tourist sheets approached this, using paper 107.8 x 85.1 cm, but the 1:250,000 Fifth Series used markedly smaller paper, 90.2 x 76.2 cm.\(^ {18}\) From the mid-1960s rather larger presses were installed, enabling a standard size of 100.0 x 89.0 cm for the new 1:50,000 series, developed from the later 1960s, and up to 127.5 x 94.0 cm for the 1:250,000 and 1:25,000 Outdoor Leisure series in the 1970s and 1980s. On the face of it, maximum press efficiency suggests that the maximum practicable size of paper should be used.

It summary, it would appear that it is reasonable to aim at a map and marginalia so laid out that the map proper occupies at least 80 per cent of the paper when folded.

**Causes of ‘inefficiency’**

Some of the causes of ‘inefficiency’ have been hinted at above. A fundamental difference between the Popular Edition and the Landranger is in the layout of the marginalia. The Popular has borders with series information and sheet number and title in the upper border, legend, scales and other marginalia in the bottom, and supplementary scale bars to left and right. The Landranger was originally designed so that the whole of the marginalia of the civil version was concentrated on the right-hand side of the paper. This was modified after 1980 when the mapping was produced to a joint civil-military specification that involved the addition on the civil version of what had always been on the military version: three extended scale bars of statute miles, nautical miles and kilometres. Within the overall printed area of its margins the standard landscape-shaped format of

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\(^{17}\) The sizes of plates for ‘quarter sheets’ varied: that for Old Series 91 SE in use in 1878 measured 51.2 x 36.3 cm; that for New Series sheet 286 in use in 1893 measured 57.8 x 42.7 cm. By no means all of this is accounted for by more extensive marginalia on sheet 286.

\(^{18}\) Memorandum on printing machines, n.d. [March 1960], 26E in TNA OS 1/1192.
the Popular has considerable ‘white space’, which ‘closes up’ on portrait-format sheets. The *Landranger’s* map area is square, and the borders can be absolutely standardised.

Map frames and borders can occupy a remarkably high proportion of space. On the 1:50,000 *Landranger* the border is 2.5 cm wide, that is 825 sq cm, or 9.3 per cent of the total paper area; on both the Irish 1:50,000s the border is 2.25 cm wide, occupying about 7.6 per cent of the paper on current OSNI issues and about 6.9 per cent on current OSI issues. Another way of putting it is that the border on the *Landranger* occupies an area equal to about 12.9 per cent of the mapped area. In contrast, the border on the one-inch Popular Edition is about 1.23 cm wide, or about 1 cm if the outside framing is discounted: including the redundant framing, this gives a border equal to 9.1 per cent of map area, or 7.4 per cent if the framing is discounted. (See figures 1 and 2.) The comparison is more in the Popular’s favour than might as first appear, as the map area of the *Landranger* is over twice as great: 6400 sq cm compared with 3135 sq cm. A 1.0 cm border on the *Landranger* would be equal to about 4.1 per cent of the mapped area. Both borders include the same information: distances to towns outside the map, completion of names, latitude and longitude values, and grid figures.19

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19 The grid figures, in the strict sense, only appear on the post-1931 military version (GSGS 3907) of the Popular Edition: the civil version has squaring instead. Earlier military issues of the Popular Edition carry full co-ordinates at 10 km intervals, in a style that is more effective than elegant.
The most striking contrast between the Popular Edition and the *Landranger* is in the treatment of the legend. On the Popular Edition this occupies $22.8 \times 2.3$ cm ($52.5$ sq cm); on the *Landranger* it occupies $10.8 \times 56.0$ cm ($605$ sq cm), or nearly twelve times the area. It could be argued that the comparison is not strictly just, as an area on the ground 1 cm square at 1:63,360 is equivalent to 1.56 cm square on the 1:50,000, but even with an increase in the Popular's legend by 1.56 to 81.9 cm, the *Landranger*'s legend still occupies more than seven times as much paper. Admittedly, the *Landranger* employs far more symbols: the Popular's legend shows about 52, the *Landranger* between about 150 and 170. This vagueness is accounted for by an element of duplication in the *Landranger*, for example for bridges and earthworks in various contexts, or by using the same basic symbol for two superficially different features, notably 'aqueduct' and 'viaduct'. It must also be admitted that, whilst the Popular's legend includes most of the symbols used on the map, it excludes a few, for example coastal slopes and making the coniferous/non-coniferous distinction of woodland. The *Landranger* legend includes all the symbols used on the map, and also many of the abbreviations, even when, such as 'Ho' and 'Fm' these would seem sufficiently obvious not to require elucidation. Even when duplication is allowed for, the *Landranger* has to carry the burden of public rights of way, cycle routes, tourist information and symbols for features which either did not exist when the Popular Edition was being designed, such as heliports and motorways, or else were not mapped, such as spoil heaps. The *Landranger* also includes grid-working and other 'technical' information which the civil version of the Popular does not.

It is hard not to conclude that the *Landranger*'s legend shows signs of a version of Parkinson's Law: in this case, the legend expands to fill space available. Even if the *Landranger* employs more area symbols, it surely ought to be possible to condense the symbols into no more than about four times the area that the Popular's symbols would occupy at 1:50,000 scale, that is about 320 sq cm, or an area of $10.8 \times 29.6$ cm.

Other marginal information on the *Landranger* includes trademark, series, sheet name and number – some 86 sq cm, of which about 42 per cent is 'white paper' – 'Customer information' (mostly 'small print' in standard-sized print), 'Technical Information' (including an adjoining sheet diagram: is this really 'technical?'), and grid-working. Some of this seems worth compressing into 'smaller type'.

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20 The original design for what became the Popular Edition, exemplified by the legend on the two *Aldershot* sheets of 1914, included two classes of steep gradients (soon reduced to one) and a symbol for 'Heath and Moor' (omitted after 1921); added later were symbols for youth hostels and electricity transmission lines; and from 1934 the road classification was modified. The count for both Popular and *Landranger* is complicated by questions such as whether the 'unfenced road' symbol should be counted once or as many times as there are road classifications.

21 Up to 2015 only 9 abbreviations were explained: now it is 18, and even then the still perplexed are told 'See our website for full list'.
An optimum size for a folded map?
In his 1993 article Chris Board described some styles of folding, but did not venture to analyse sizes. Later nineteenth and earlier twentieth century publicity for topographic maps often advertised them as ‘folded for the pocket’, so this may perhaps be taken as guidance. Figures 3 and 4 show respectively Ordnance Survey of Ireland 1:50,000 Preliminary Editions (folded size 12.3 × 17.5 cm) and an Ordnance Survey of Great Britain 1:25,000 Explorer (folded size 13.3 × 23.8 cm) in the same sports jacket pocket: the one is ‘pocket-sized’, the other decidedly not. Figures 5 and 6 show the same maps open for navigation in the front seat of a car: the OSGB map – the same size as the 1:250,000 Travel Map series – fits awkwardly.

![Images of folded maps in pockets and open in a car.](image)

Figures 3 and 4 (top). Five Ordnance Survey of Ireland 1:50,000 Preliminary Editions in a coat pocket - but for the flap being up, the only evidence of them would be a bulge - and 1:25,000 Explorer sheet in the same pocket.

Figures 5 and 6. Ordnance Survey of Ireland 1:50,000 Preliminary Edition and Ordnance Survey of Great Britain 1:25,000 Explorer in the front passenger seat of a car.

A suggested map
A hint of what might be possible is provided by OSI's 1:50,000 Preliminary Edition sheet 78 of 1988. The paper area is nearly, but not quite, B1 size: 98.7 × 67.3 cm, compared with 100 × 71 cm for B1. The legend occupies 162 sq cm and
includes some 37 symbols: churches and triangulation points are shown on the map but omitted from the legend, though they could easily have been fitted in.\textsuperscript{22} The style of the map is decidedly ‘basic’, with uncased roads; foreshore is not shown. To this writer’s mind it is an extraordinarily pleasing map, the ultimate in simplicity, and a challenge in both cartographic and in real-world terms.\textsuperscript{23} It is suggestive, in size of paper, integral cover, minimalist content, and a minimum of ‘white paper’, of an alternative approach to that embodied in the \textit{Landranger}. It is possible to conceive of a map designed along the following lines:

- Paper size: B1
- Folding: 8 × 4
- Mapped area within neat line: 84.0 × 68.0 cm (5712 sq cm: 1428 sq km at 1:50,000, 357 sq km at 1:25,000)
- Border: 1.0 cm in width
- Legend: to be down either the left-hand or the right-hand side of the map: the upper half to be occupied by an integral cover, including indications of adjoining sheets, and the lower half to be occupied by the legend and any other necessary explanatory matter

This gives a map area of 80.4 per cent of total paper. An alternative is A0 size paper, 116 × 84 cm (9744 sq cm), folded 10 × 4, and with a map area 102.0 × 80.0 (8160 sq cm), giving a map occupying 83.7 per cent of the total paper area.

A diagram of paper usage by the Popular Edition, the \textit{Landranger} and the suggested map on B1 paper is given in figure 7.

\textbf{An ‘ideal’ map?}

The investigation in this article suggests that, if there is an optimum size for a topographic map, it is a map area of 84.0 × 68.0 cm, printed on B1-size paper, folded 8 × 4. This makes good use of paper, and folds into a convenient space. It would impose some constraint on the content of the legend, which in turn raises the question of whether there is optimum map content. That can be addressed on another occasion.

\textbf{Figure 7. The relative sizes of the OS one-inch Popular Edition and 1:50,000 Landranger, and a suggested map suitable for B1 size paper. Black denotes neat lines; green denotes outer limit of border and frame; blue denotes legend areas; purple the area allocated to integral cover; red the edge of paper.}

\textsuperscript{22} Sheet 56, Preliminary Edition, dated 1989, has a modified legend, with 50 symbols.

\textsuperscript{23} An alternative view is that it is riddled with ‘silences’, notably as to tourism and other indications of consumerism.
**Don’t ‘lose your way’**

*Patrick McCarthy*

Members will know that modern OS maps at an appropriate scale show Public Rights of Way (Public Footpaths, Bridleways, etc.). The information derives from Definitive Maps created by Highway Authorities in the 1950s as amended.

It has long been appreciated by organisations concerned with access to the countryside and mobility in urban areas, and Highway Authorities themselves, that many ‘ways’ could be claimed as public but which were not included on the Definitive Maps and therefore on the OS publications.

Though many claims have been successful it is estimated that there are many hundreds of ‘ways’ which could reasonably be claimed. The Public Rights of Way Act 2000 created a cut-off date of 1 January 2026 for the acceptance of claims made on the basis of some types of evidence, thus a ‘way’ could be permanently lost.

The organisations involved include the Open Spaces Society ([www.oss.org.uk](http://www.oss.org.uk)), Ramblers ([www.ramblers.org.uk](http://www.ramblers.org.uk)) and The Peak & Northern Footpaths Society, which is taking very positive action in the counties of Staffordshire, Derbyshire, Cheshire, Greater Manchester, Merseyside, Lancashire, South and West Yorkshire ([http://peakandnorthern.org.uk/lost-ways/lost-ways.htm](http://peakandnorthern.org.uk/lost-ways/lost-ways.htm)). Equestrians are similarly concerned, led by the British Horse Society.

May I ask that any member who considers this matter of interest or can contribute from their own knowledge to contact an appropriate organisation or contact me¹ for more information.

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¹ on 07757071535 or patrickjmccarthy29@gmail.com
Figure 1:  
Extract from 1:50,000 Mapa Topográfico Nacional de España sheet 1089 Santa Cruz de Tenerife

Figure 2 above:  
Part of 1:30,000 Hikers’ map Tenerife

Figure 3:  
Photograph of part of National Park signboard at Taganana showing waymarked path PR-TF8 [photo Alastair Davies]
Map review

Tenerife Hikers’ map, Discovery Walking Guides, 3rd edition 2017, £8.99

Walkers familiar with Landrangers and Explorers, lured from home to the warmer climate of the Canary Islands will find that Spanish national mapping isn’t as suitable as OS maps for navigating hilly terrain. Help is at hand, however, in the form of the Hikers’ map series, of which this recent new edition is just one. Similar maps cover hiking areas in other Canaries, the Balearics, Madeira and elsewhere.

The Tenerife map is two-sided, printed on ‘super-durable’ waterproof Polyart and comprises four sections showing popular hiking areas at 1:30,000 scale. The map sections use UTM projection with a grid of latitude and longitude at 1 minute intervals. Contour lines are at 50m intervals and altitude is indicated by coloured bands at 300m intervals. The island’s long-distance trail GR131 is depicted in green, with other hiking trails in red. Overall, the map is attractive, easy to handle and potentially a valuable aid to navigation.

We ‘road-tested’ the map in the Anaga peninsula in the north of the island. A glance at the relevant section (figure 2) in comparison with the Spanish national map (figure 1) shows that, without doubt, a walker armed with the Hikers’ map would more confidently set out west along the coast from Taganana with a view to completing a loop back to the village. There is a catch, however, which is that the red highlighting indicates not waymarked paths as might be expected, but only those routes which are described in a separate book, Walk! Tenerife. This becomes apparent at Taganana, where the National Park signboard seen in figure 3 shows that the waymarked path (PR-TF8) from Afur to Taganana takes a more southerly mountain pass than that shown on the map, thus rendering the map slightly less useful than expected, especially as the actual on-the-ground waymarking is slightly random.

Nevertheless, Tenerife Hikers’ map is an excellent map, conveniently-sized (about 830mm by 610mm), clearly drawn and pleasingly coloured with very legible lettering and robust enough to withstand rain, wind and rough-handling. A boon to island explorers!

John Davies

We asked owner David Brawn about the history of Discovery Walking Guides:

September 1960 Class 1T’s form master, Mr Lance, teaches us geography using Ordnance Survey maps to explain the UK landscape. By Christmas we have a perfect knowledge of OS symbols and their meanings; my interest in cartography starts here.

Fast forward to 1988 when we have decided to give up our professional careers to move to southern Tenerife’s idyllic climate. Waiting for our BookSwop shop to be completed and fitted we notice that across the fast-developing Playa de las Americas/Los Cristianos resort area all the tourists seem to be lost most of the time. There is no accurate street plan of Europe’s biggest tourist resort. Equipped with a hand compass and a notebook we set out to produce a Tenerife South Tourist Guide and Street Plans.

Each day we set out to walk the streets, recording the number of paces and compass direction. In the evenings, I add the day’s research to a hand drawn master map scaled in ‘paces’. Day-by-day the master map expands until I have the whole resort area covered. In the absence of street names, I name all the key features; hotels, apartment and shopping complexes, bus stations, filling stations, post offices, police stations etc.
Finally, my master map is camera ready, off to a local printer and my first published map is born. *Tenerife South Tourist Guide and Street Plans* is furiously popular featuring in local newspapers and magazines, used on advertising flyers, and (surprisingly) adopted by the authorities. Visiting the Policia Local (police) and Correos (Post Office) I find they have redrawn my Street Plans to huge scale wall murals dominating their offices. The Street Plans are copied and reproduced in their thousands and then tens of thousands, unfortunately in breach of copyright so while I have produced the island’s most popular map my financial return was negligible! When I updated the street plans using GPS I found that my original ‘paces and compass bearing’ survey was remarkably accurate.

1988 to 2000 saw us producing a series of ‘map fold’ walking guides financed by profits from our BookSwap book-selling and designed to encourage tourists to explore the wild regions around their resort. At first I used hand-drawn maps for the guides but then started licencing map sections from the Spanish military (similar rates to OS licencing). These official maps were the best available but were also way out of date. Each guide required additional cartographic detail to bring the official map up to date. With low sales and high expenses, we were losing a serious amount of money, causing us to have a complete rethink as the new millennium approached. Luckily five related factors conspired to put me on the road to producing *Tour & Trail Maps*.

GPS was coming of age as I invested in a Garmin 12XL plus Oziexplorer and GPS Utility software, meaning I had a moderately accurate survey record of where my GPS had been and I could show that survey on a geo-referenced base map; moderate being +/-50 metres accuracy due to Selective Availability. We bought a tiny Smart car to complement our Land Rover Discovery; the Smart was ideal for street surveys while the Discovery handled all the off-tarmac surveying of tracks. We added Garmin marine 128 GPS units with external aerials for car use. Now we had a survey system that could record everything from motorways, streets, dirt roads and walking trails (on foot with the 12XL) to 50 metre accuracy.

In May 2000 Bill Clinton turned off Selective Availability, improving our GPS accuracy from 50 metres to +/-10 metres; well within cartographic requirements to produce large scale mapping – we then added a £10 gadget that improved the accuracy even further to +/-2 metres. NASA had flown its ten day SRTM mission in February 2000 and the results were made public for those who could interpret the topographical data; at a stroke elevation data (contours) was available for the earth’s surface.

Year 2000 was a perfect storm for me. I had the equipment, technology, NASA and a US president on my side. We went off surveying the Canary Islands, Madeira and Balearics, including hiking research for our new *Walk*! guide books. When we were at home I would be producing the geo-referenced base map from our surveys, then, using these as the base layer in onscreen drawing of the *Tour & Trail* map. In deciding how the features would appear on the T&T map I borrowed from maps I liked; altitude shading came from the old Bartholomew maps, while road widths were loosely based on OS 25/50k maps. Presentation of features was decided based upon how they would be seen by the user and clarity of presentation on the printed map; for a car driver petrol stations and roundabouts are big features so they are presented larger on my maps than their size alone would justify.
I would like to say that Tour & Trail maps took off at that point but a basic mistake between onscreen and print colours, combined with a desire to see my Madeira Tour & Trail map in print, led to a disastrous pulping of the whole 5000-copy print run. By now self-taught cartography was looking like ‘private education’, very expensive now with any benefits happening in the distant future. I stepped back, redesigned my colour model, narrowed the contours, adjusted the place name fonts, and most importantly diligently proofed the work before agreeing to the printing; at last I had my first Tour & Trail map available for sale. La Gomera followed then Menorca, Mallorca North & Mountains, Lanzarote, Tenerife so the series began to build. Each Tour & Trail map was slightly different from the previous ones as details were refined and improved each time I designed a new map. While the first Tour & Trail map of a region was very labour intensive to design subsequent updating in 2001 for new 2nd editions of Madeira, Menorca and La Gomera was a doddle.

Tour & Trail maps sold moderately, the 2nd editions better, so that at last we were not losing money publishing maps but two more factors were needed before the present generation of maps emerged. Amazon arrived and introduced the Advantage scheme for publishers who then supplied Amazon direct. Tour & Trail map titles now got equal billing on Amazon with other publishers; sales started to take off giving a pleasing increase in cash flow. At a Barcelona trade show we met David Wilson of Victoria Litho who extolled the virtues of Polyart as a map material; this gave us a top quality printer and a material for Super-Durable Maps.

While the commercial conditions improved the steady development of Tour & Trail map standards continued with each new map published. While conventional map publishers (eg OS) have to wait for a new map series before implementing improvements, I could up the standards with each map that I designed. This means that Tour & Trail mapping develops much faster, each time producing a better product for the user. My philosophy has always been to try and improve the map users experience through concentrating on map clarity in use and setting feature standards that reflect what the user sees and/or needs to see. Conventional cartography would say that a walking trail should be smaller than a country lane, because it is smaller than the road, but if you are a hiker the walking trail is very important so it deserves equal billing with the country lane.

Tour & Trail maps have come a long way since 2000. Now my Super-Durable Maps now carry a 2-Year Guarantee against falling apart, or splitting, in ‘adventurous use’; they also carry the green Recyclable logo. Digital Custom map editions of my maps are now being made available for free download on the DWG website, giving people the chance to see the full map before deciding to buy the printed edition. This year I will move from the base-map layer drawing design approach to a database based design approach significantly reducing the time to produce a new Tour & Trail map.

It has been a long road, with many bumps along the way, to get here and ahead the road stretches ever onward.

Left: New titles in April 2017
Revision Points and Timepix

Elaine Owen

In *Sheetlines* 98, December 2013 concern was raised over the fate of the old OS Revision Point albums. Some were destroyed, but others are now known to be preserved in several local archives including Croydon, Lambeth, Liverpool, Manchester and Taunton. OS kept their albums too, from the old Survey Services group, and since moving to Explorer House these have been accommodated in a remote store. Now catalogued, attention is turning to a programme for digitising the photographs.

**Revision points of Manchester**

This collection, contained in eight large boxes was donated to Greater Manchester County Record by local OS staff. After faithfully storing these on their shelves for the next twenty years archivist David Govier alerted me to them when I visited for another reason. I promised to find the resources to digitise them and we received them back at OS to undertake the work using volunteers. The Manchester collection is exceptional, both for its size (upwards of 45,000 photos) and for the survival of the original negatives. These were not usually ‘pruned’ when RP’s were destroyed so they contain more pictures than the accompanying albums. Better quality images can also be obtained from a negative and by the time you read this scanning should be complete.

**What is an ‘RP’?**

The purpose of Revision Points (RPs) was to provide a network of known instrumentally surveyed locations that could be used to ‘control’ the position of detail on a large-scale map at 1:1250 or sometimes 1:2500 scale. RPs were fixed to an accuracy of 0.1 metre and made use of corners of buildings, or other immovable features that were expected to remain in the landscape. Sometimes permanent features for RPs were in short supply and the rivets or pipe-nails used to mark them were driven into fence posts, or other less acceptable substitutes instead. From pairs of RPs, lines could be measured (chained surveyed) allowing for map details to be ‘off-set’ measured with a tape. Chain surveying was later superseded by tacheometer (‘tachy’ for short). Future map revision would require the RPs to be found again and initially their positions were shown using a diagram, but photography was quickly adopted as being the best visual reference medium.

The earliest 1:1250 maps were surveyed in 1943, but it was not until 1946 that the programme started in earnest, with the Manchester survey beginning that summer.

**Content of the Minor Control Point albums**

Albums contain a mixture of forms, lists, diagrams and the photo pages. The photo pages were often made from out-of-date chart paper maps cut to size, with the photos pasted two or three at a time onto the blank backs.

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1 Elaine Owen (nee Pilbeam), co-author of *Ordnance Survey: Map Makers to Britain since 1791*, is Sector Manager at Ordnance Survey and founder of Timepix.Ltd.
Most albums contain Permanent Traverse descriptions. These would normally include sketches to support the diagram.

Reasons for any changes were recorded on an ‘OS480 Report of Errors or Omissions on R.P. Descriptions and destruction of Revision Point’.
**RP photographs**
The two essential elements to be captured were the ‘hymn board’ and the arrow tip. Otherwise the objective was to include any other detail that would help the RP to be found again.

The arrow (always called a pointer) was usually white on one side and black on the other. The white side was most commonly used, leading to these being called ‘man with a white arrow’ photos. To start with the boards were sizeable, and a third person was often required to hold it steady, but from Spring 1948 the smaller board was used with the additional information captured by surveyors and typed up as a caption to the photos. Most boards showed the date, but not always.

Street junction (and hence building corners) were preferred locations for RP points as they give line of sight in more than one direction, which means that corner shops are often captured in the photos.

**Photo quality and density**
Photos were taken on medium format black and white film and contact-printed onto glossy paper (although some were printed on inferior matt paper giving a low-quality sepia image). Quality is very variable. Sometimes the photographer forgot to focus, or they used settings that gave restricted depth of field. Photos can offer a wide view of the entire landscape or a photo that focuses closely on the board and lower street-scape. The latter can give the impression you are seeing the world from the viewpoint of a very small child. Poor light and bad weather also affect image quality.

At least twenty photos would support each quarter km. Many of the Manchester albums are much more dense, with over 100 photos per km not uncommon. The largest number, found in Stockport, was 243 photos.

**The men with the arrows**
These men were Field Labourers whose job would include carrying equipment and generally assisting the surveyors. Locally employed, their names have not been found in the surviving OS staff lists. Some stayed for years, others just for a season. Surveyors took the photos and although their names are contained in the albums it does not specify who took each photo.

**Timepix Ltd**
Timepix is a new independent company which will, in Autumn 2017, launch an app to geo-locate historical photos making them viewable either on a mobile device or desktop computer. A toggle gives access to historical Ordnance Survey maps from the 1880s/1890s, from national to 6-inch scale, so that photos can be seen against either modern or historical maps. Photos will be over fifty years old and some of the first to be added will be those from OS own history, including some of the retriangulation, RP photos and from previous OS office locations. Low resolution watermarked copies may be shared and downloaded for free, but charges will apply for high resolution licences, in order to fund the site and its future development.
Some examples of photographs which will become available for download on Timepix. For more information, email admin@timepix.uk with Charles Close in the subject line to receive an email with more details closer to the launch date.
Kerry musings

David Archer

Quite a few members have attempted to collect every cover illustrated in *Map cover art*, but I know only one to have succeeded. And like everyone, along the way, he has been distracted, and now has every one-inch map in sets, all the half-inch, quarter-inch and so on. Fine, so what you might say. And I would reply that in addition to being distracted by collecting whole series, he has also collected every state of a cover he has found within each series. By which, I mean he has eight, ten, twelve or more copies of some tourist maps, or possibly some Seventh Series sheets, all with slight differences on the front cover. Price changes, positioning of text, variant text, different borders; standard covers and benderfold covers, all vary. Do not ask me how he remembered what he had when out and about, just assume him to be my imaginary, and very capable friend.

Such a task is not everybody’s cup of tea, and even he admits the series maps overwhelm the collection, distracting from the achievement of finding so many different covers. Which is why he has decided to start disposing of the whole lot, emptying the keep net and throwing things back into the pond. Done that. Whilst I agree with this approach, and believe it good that other collectors will thereby have a chance of adding some scarce, and not so scarce maps to their collections, I also wonder what might be salvaged from such an achievement? Could the society benefit from such monumental collecting?

It seems wrong that a collection which in other circles would be considered of national importance, should be broken up without being recorded, let alone kept intact. Hey, wait a minute, some shout, why ‘of national importance’? Because nothing in any public collection in any way even starts to compare with such a collection as outlined above. A legal deposit library might have some sets of maps in covers, but this would only represent one state of each cover, and as for the illustrations in *Map cover art*, no public collection has them all, and few have any variants.

The raison d’être of the Ordnance Survey has always been to produce maps, and although recording the minutiae found in different map states is not everyone’s cup of tea, as a society we appreciate the necessity of doing so, and applaud those who seek out and record such differences. But the OS was also expected to sell maps, and for over a hundred years, has been selling them in attractive covers, which in themselves are collected by members, sometimes with more fervour than the maps, giving equally compelling arguments for recording the minutiae of map covers and building The Charles Close Society’s *National Ordnance Survey Map Cover Collection*. Sounds good? It will be fantastic, so label it as such.

Why build such a collection, one might ask? Because there is no comprehensive collection of Ordnance Survey map covers open to the public. Even if all the map covers in all the libraries in the UK were brought together in one place, they would lack many of the scarce covers and would not be
meaningful as a national collection. When we started selling OS maps, a couple of legal deposit libraries bought some tourist and district covers, in an attempt to have an example of each illustration from the Map cover art list. But to venture very far into the realms of cover variations was beyond their budgets. Such an approach is pretty half-hearted: buying a single blue octagon aviation map as illustrated, whilst ignoring the need to hold representative copies in small and large covers together with examples of green and red octagon bearing covers.

Can we justify building such a collection? Yes. It certainly falls within our society’s objectives. At present, anyone wishing to study OS covers has to rely heavily on access to private collections, the contents of which are largely unknown, because as a society we have never asked what members own. For all of us a reference collection would help when something is found that is thought to be unusual. One could check a new find and, if absent from the national collection, details could be recorded or even a map donated, eventually.

So, what am I proposing?

My suggestion is that the society starts building a comprehensive collection of Ordnance Survey map covers, including all the byways and distractions that both the enthusiast and researcher will appreciate. For series maps, which usually have the same basic cover we might have examples of every variation, and detailed records of which sheets these appeared with, rather than physical examples of every variation of every sheet. For non-series maps such as tourist and district maps, I suggest that the collection actually does hold examples of every cover used and every state of a cover. The same cover with four different prices, and two of those prices shown in two different styles of lettering and so on. The sort of thing that one assumes would have been recorded in the job files. Such a collection could justifiably be assembled as part of the society archives held by the Map Department of Cambridge University Library, with a CCS member undertaking most of the work. We might even persuade the Ordnance Survey to sponsor the collection, or to donate copies of new covers, artwork and proof copies of proposed covers, most of which I assume are just destroyed for want of a better home.

How will we build the collection? I suggest that we view this as a long-term project and await donations. It would be wonderful if at an early stage a good collection were bequeathed to the society as a foundation, but a start should be made soon. I am quite happy to start giving items now: a small collection of half-inch training maps with different printer’s details on the front, pre- and post-war archaeological maps, Populars, Fifth Edition and Tourist maps with labels changing the map name. Only for exceptional items should the society consider purchasing a map for its cover. And by exceptional, I mean unknown and significantly different from known examples to be considered important. All additions to the collection should be acknowledged to encourage donations.

Why do we need to have the actual covers to study? With maps, different states can easily be described: the next state has italic town names, or a new railway line is shown. Such indicators are easily understood by all. But with covers things are different. A change of lettering style is almost impossible to
describe to the average person, and giving each style a name is meaningless to most of us. However, put two maps side by side and such differences are seen in an instant, especially if prompted.\footnote{Whereas a map is a single sheet of paper, a cover might have four surfaces of interest, plus a leaflet, envelope or note stuck on. Such details are of interest to many members and need recording, preferably here, rather than in another database or collection.} As with antiques, only by handling an item can the maximum information be obtained. The secrets held within some early laminated white covers, where 1:2500 maps and trench maps were used as inner layers could only have been discovered by holding them to a strong light.

This all sounds very nice, but at the 2017 AGM, only a handful of people said they had visited the society archives, so how else could the membership consult the collection in order to spot gaps or identify a map they hold? Answer: have a parallel collection of cover images on the society website, together with scans of maps not held. If everything in the collection were on the website, members could easily spot a difference between a cover held and similar on-line images, even at a bookfair with a smartphone. In the same way, when a large collection is dispersed, it will not be a great loss to the society as at present, as hopefully, scans of interesting items will have been passed to us, awaiting the donation of actual covers. Many library catalogues, even the British Library now have small book cover images, or even whole maps added to on-line catalogue entries as a service to users. If this is the way forward, with hard copy collections and on-line images of the collection, we should do the same for our members and must not lag behind. Members might even be able to download the image collection as a ready-made catalogue, awaiting items to be ticked.

Especially in the early, formative years, building the collection and acquiring scans will be very time consuming, beyond the resources of the Map Department in Cambridge, so as suggested, a CCS member could be responsible and have a small budget for certain expenses, to purchase items and acquire good scans in order to exercise quality control of images. The structure of any collection needs to be agreed upon. With Roger Hellyer’s list in Map cover art being accepted by all, it would be churlish not to use and modify it as required.

What will be the benefits of building the covers collection and having the supporting images on-line?

Firstly, we would be establishing a collection of national importance, the only comprehensive collection of map covers, showing what the Ordnance Survey produced and how covers were used for sales promotion. As a resource for research, nothing would compare with it, and visitors to the collection would help the Map Department’s usage statistics.

Secondly, by furthering the society’s objectives, it will give so much pleasure to our members, many of whom have much thumbed copies of Map cover art, and dream of an updated list with more illustrations.

Thirdly, it would be a continuing project, which all members could participate in. Not all members are moved to contribute to Sheetlines, just as not all can attend meetings. But a far greater number collect maps and would be able to add
to the project if luck were with them. Many collectors own at least one choice item, not necessarily a rare map, but frequently a scarce form of a standard cover.

Finally, an on-line images collection would draw attention and possibly new members to the society, and might well result in new information being supplied on the OS and its work.

To add to the mounting excitement, it appears that a start has in fact been made. A good while ago, John Davies put some cover images on the society website, and as I write, I understand another member is poised to add to these with around 300 cover images from his collection, so that most items listed in Map cover art will be illustrated, with the addition of variants and new discoveries.

Surely this is an excellent way of starting the new collection; establish the image collection first, possibly using captions in bold to identify items held as hard copy, so that anyone can easily see what is missing. Maps and more scans will then be offered by members, and the collection will expand. Plus, the archives has already started receiving cover examples. A while ago, my offer of two groups of covers was accepted, so it appears that both strands of my suggestion are already under way; all we need is formal recognition of a covers collection and the appointment of an organiser. If Cambridge has the space, and the Archives Sub-Committee can continue to keep the ball rolling, the society is destined to have its own superb map collection.

Several CCS visits are currently being organised, as listed below. Dates and details are not yet fixed, but members interested in joining are requested to contact Bernard Anderson on 01255 670072 or visits@CharlesCloseSociety.org to express interest; this will help in finalising the arrangements.

Late September / early October: Map libraries and other cartographic attractions in and around Glasgow and Edinburgh.

Early 2018: Manchester University library and Chetham’s library, both of which have extensive collections of maps and atlases.

13-15 April 2018: Weekend of walking and talking at Shap Wells Hotel, Cumbria.

Cambridgeshire Records Society has re-issued Jonas Moore’s Mapp of the Great Levell of the Fenns, 1658 in the form of map, CD and accompanying booklet, price £36, available from www.cambsrecordsociety.co.uk

The British Cartographic Society has published a list of major map collections in UK at www.cartography.org.uk/map-collections


Copies of out-of-print Ordnance Survey books about its history, such as Owen & Pilbeam’s Map Makers to Britain since 1791 and others are available for free download at https://www.ordnancesurvey.co.uk/about/overview/history.html
Left: Charles Close Society members Mike Cottrell and Peter Stubbs recently met up in Hobart, Tasmania, having discovered that they would both be there on the same day. Here they are seen in what may well be the most distant CCS meeting of all time.

Below: Notice from Salisbury & Winchester Journal spotted by Bill Riley.

Bottom row:
Quick, at a glance, how far from the Finest view in England to the White Horse and which way to the Old Battery, left or right?

[photos of Sutton Bank Visitor Centre and Isle of Wight by John Davies]
Comments were requested on the photo of the OS Cricket Club (Sheetlines 108, 8). I believe the Warrant Officer in uniform bears a resemblance to RSM Harry Thornton shown on the left in the above extract from a Survey Battalion group photo of circa 1926 sitting next to Lt JD Newman and Brig EM Jack. A medal expert might be able to compare those worn on the two photos, but it is beyond me with the material available. If it is Thornton, I believe the photo must be pre-1926 but post WW1; unless the medals worn by the W.O. date back to Boer War, but I think that unlikely.

Mike Nolan

Might I just add a clarification to Ian Byrne’s letter in Sheetlines 108? The acronym VEB was not as specific to map-publishing as might appear from his letter. It stood for ‘Volks Eigenes Betrieb’, and was the formal indication that the business concerned was in public ownership. Thus ‘VEB’ was prefixed to the name of almost every business in the GDR, from those producing or selling foodstuffs to those manufacturing industrial goods. In the final decades of the GDR road maps for public sale, such as the one mentioned in the letter, were published by VEB Touristverlag. There had however been a restructuring of map publishing during the 1960s, and earlier issues usually carry VEB Landkartenverlag as the publisher’s name.

From the 1960s onwards all public-sale maps of the GDR published in the East-Bloc derived from the same underlying (security-cleared) base-maps. (Incidentally, the large-scale town plans were constructed using approximate scales that varied unpredictably across the sheet.) The maps published by Cartographia of Budapest contained the same information as those of VEB Touristverlag; the difference was principally in availability and in paper-quality. The paper used for East-German public-sale maps was soft and rapidly tore along the folds. VEB Touristverlag however also published the same maps in hard-backed atlas forms which were somewhat more robust, despite using the same paper for the pages. Some of these atlas editions also included equivalent mapping of the other socialist brother-states (other than the Soviet Union). It
should however be noted that, even at the time, finding copies of these maps and atlases to buy was a challenge. Print runs were quite short (the numbers appear in a small-print block of text on the map), and the copies were distributed to retailers in accordance with centrally-determined plans, and not according to actual demand. So GDR retailers tended to have maps in stock for distant parts of the country, while having sold out of the local maps. Nevertheless, unsold stock can still sometimes be discovered in odd places. A second-hand bookshop near Prague main railway station had a box-full of pristine GDR public-sale maps available for sale as recently June 2016.

John Cruickshank

**Corrections**

In the article *The Special Emergency Edition in Lincolnshire* in *Sheetlines* 108, page 24 paragraph 2 ‘SEEs may be encountered, photo-reduced …’ should read ‘ARP revision material may be encountered, photo-reduced …’. On page 27, caption to figure 5 should read ‘Lincs 27NE, Stables at Scawby Hall on SEE’.

On page 32 of *Sheetlines* 102, Manchester Piccadilly, Manchester Victoria, Bournemouth and Southampton are missing from the list of principal stations.

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It can pay to be a nerd!

Family and friends may sometimes tease a map fan on his nerdy tendencies. But it can pay off, as my story shows. I recently spent a day exploring Paris by bus and metro. At one point, I discovered I was without my wallet. No idea what had happened to it, but it mattered, as it contained all my money, credit cards and travel card. Without it I was stranded. Trying not to despair, I realised that one possibility was that I had dropped it on the 73 bus I just got off. Careful scrutiny of maps and schedules revealed the time at which that same bus would be likely to return to the vicinity. Worth a try! And indeed, the bus did arrive as predicted – and yes, after some undignified scrambling under a lady passenger’s legs (I didn’t have the French to explain), there was my wallet, unscathed. Clearly the lesson is to pay close attention to maps and timetables.¹

John Davies

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¹ Family and friends may well say that the lesson is to pay more attention in the real world, pointing out that I had form, having previously lost that same wallet in a shopping centre in Latvia and a bus station in Poland (and got it back, unscathed, both times).