

Reviews in History

Published on *Reviews in History* (<http://www.history.ac.uk/reviews>)

Map of a Nation: a Biography of the Ordnance Survey

Review Number:

1109

Publish date:

Monday, 1 August, 2011

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ISBN:

9781847080981

Date of Publication:

2010

Price:

£25.00

Pages:

436pp.

Publisher:

Granta

Place of Publication:

London

Reviewer:

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A biography conventionally covers a whole life and the term is now popular with publishers as a substitute for the word history. We see it applied in recent titles to a city, a river, a building and now an organisation. This biography of the OS, in fact, covers the conception, difficult birth and growth to early maturity of the Ordnance Survey from the 18th-century Enlightenment and subduing of Scotland to the mid 1870s. In OS map terms, it ends when the Old or First Series one inch maps were superseded by the New or Second Series (there were eventually seven series of one inch maps before metrication in 1974). It entirely omits the 20th century apart from map cover art.

Although less than a full biography, *Map of a Nation* is a well told and stirring story of the various and diverse individuals and the convergence of Enlightenment ideals, military needs and improving survey technology to create the vital organisation that became the mid-Victorian Ordnance Survey. Rachel Hewitt has written the history in terms of the colourful and influential personalities associated with the Survey up to the late 19th century, by which time the organisation was well established, secure in its future but becoming perhaps too large and grey for a popular history. Rachel Hewitt is a born story-teller and her book is a good read.

Of the 12 chapters, the first three are concerned with individuals, events and the *zeitgeist* of the century leading to the birth of the Ordnance Survey. In Scotland, the difficult terrain and the absence of useful maps

of the Highlands made the suppression of the clans by the Hanoverian monarchs of England prolonged and ineffective. The need for accurate maps was paramount for effective military action and the construction of military roads into the trackless Highlands. In parallel, landowners began to appreciate the value of good maps to manage their properties, design their parks, quantify their resources and extend their estates by reclamation of unused wastelands. The appreciation of the uses of accurate maps was one aspect of the Scottish Enlightenment. Ms Hewitt introduces David Watson, Robert Dundas, and William Roy, all forceful characters. Watson was quartermaster of the Duke of (Butcher) Cumberland's invading forces and typified the quantifying spirit of the age. Dundas was a major landowner in Lowland Scotland, influential Edinburgh politician, brother-in-law to Watson and advocate of good mapping for conquest, administration and economic development. William Roy was one of generations of factors of the Gordon estates (Dundas was married to Ann Gordon) and was recognised from a young age for his drafting capability. Dundas recommended Roy to Watson's staff and he was commissioned in 1747, aged 21, to carry out 'the first proper survey of the country' (p. 17) for the routes of the Military Roads into the Highlands and 'to be particularly attentive to the produce of each part of a Country, and how Inhabited' (p. 26). The web of family connections and overlapping interests of these and numerous other individuals of the Lowland Scots Establishment is well described and documented as events lead towards the institution of a state mapping organisation.

Roy's promotion to the Board of Ordnance, his consequent move in middle age to London and his developing connections there are related sympathetically. He was nominated to the Royal Society and became a friend of its president, Sir Joseph Banks. Roy continued to advocate an accurate national map for security reasons and commenced a personal project to measure very accurately a baseline on Hounslow Heath as the basis for the triangulation of Great Britain. Roy's advocacy and projects led to his involvement with Cassini de Thury, of the French cartographic dynasty, who proposed to establish the true relative positions of the Paris and Greenwich Observatories by triangulation 'very important for the reconciliation of existing sea charts. As in Scotland, the interests of the landowner- military caste (particularly Charles Lennox, Duke of Richmond) and men of science in accurate mapping provided the seed bed for the eventual Ordnance Survey. Hewitt sets out the scenes and the characters well. She describes the development of techniques 'triangulation, levelling' and instruments 'alidade, theodolite, circumferometer, survey chains' briefly, although more diagrams would have helped.

Chapters four to six treat the events at the birth of the Trigonometrical Survey of the Board of Ordnance. In 1791, Lennox directed that the Trigonometrical Survey, the triangulation begun by Roy, be continued by artillery officers of the Board of Ordnance. Clearly, Roy had intended that topographic detail would infill the accurately established triangles; however, in 1791 it was not clear whether this 'interior' mapping detail would be carried out by civilian or military surveyors. Events in France and anxiety at the possibility of invasion by revolutionary forces or, later, Napoleon spurred the progress of mapping the detail. In 1795, the drafting office (civilian) at the Tower was charged with the surveying and recording of detail. It became known as the 'Topographical' or 'Interior' Survey and was formally linked to the 'Trigonometrical' Survey. The interior survey was drawn in manuscript at six inches to the mile. The published maps were reduced to one- inch-to-the-mile and engraved in the Tower by a team led by William Faden, civilian 'Geographer in Ordinary to his Majesty'. The first completed map was of the county of Kent in 1801. (An extract forms the front end paper). The first use of the term 'Ordnance Survey' in manuscript was in 1801, but it did not appear on an engraved map until 1810, on the 'Ordnance Survey of the Isle of Wight and part of Hampshire'. William Mudge was the effective head from the start and actual head of the Survey from 1804 to 1820. Hewitt spends time on Mudge and his circle of family, friends and colleagues to flesh out the background of his technical aptitude, enquiring mind, work ethic and to, what we would refer to today as, his people skills.

With the survey established as a vigorous but small institution, the third quarter of the book charts aspects of Mudge's progress in England and Wales, the public impact of the OS maps, and the extension of the great arc of triangles through Scotland and up to the Shetlands. Military priorities directed the completion of the Trigonometrical Survey in coastal areas beginning with the Essex shore. The smog of London's coal fires

obscured Mudge's sight-lines from his station on the dome of St. Paul's to trig points on church towers in Essex.

After the defeat of Napoleon, Mudge, with his new assistant Thomas Colby, proceeded to the survey of Wales. The rain and natural haze obscured or distorted sight lines between trig points, but the rugged relief also challenged the cartographic skills of the Survey. 'Hill drawing was the most taxing element of map draughtsmanship' (p. 189). At this point Hewitt introduces Robert Dawson and his son, Robert Kearsley Dawson, who were masters at depicting relief clearly and accurately by means of hill shading. She re-introduces Paul Sandby, who had assisted Roy as a young draughtsman and topographic artist for the Military Survey of Scotland decades earlier and in the interval was a founder member of the Royal Academy. Sandby taught art to trainee map-makers at the Royal Military Academy at Woolwich. In Wales, the problems of toponymy came to the fore. The accurate recording and the correct and consistent spelling of place names was a particular problem in Wales. Current and historic, English and Welsh usages were often at odds. The surveyors consulted widely; local vicars and gentry were frequent sources of advice. Colby and Mudge opted for the version recommended by the greatest number of sources.

In chapter eight 'Mapping the imagination', Hewitt cites responses of Wordsworth, Coleridge and Blake to maps. Wordsworth visualised Colby and Mudge's ascent of Black Combe in the southwest corner of the Lake District in *Inscription: Written with a Slate Pencil on a Stone, on the Side of the Mountain of Black Combe* and *View from the Top of Black Combe*. Blake raged against the rationality of maps. Coleridge left his own sketch maps of his Lakeland walks, all prior to the publication of OS maps. There are several references to minor poets describing landscapes 'spread like a map' and to contemporary plays and novels in which characters are reading maps as soldiers, or scaling the distance to a loved one. Many of the references are anachronistic referring to maps before the Ordnance Survey's; or, in the case of 1930s map cover art, beyond the historic frame of the rest of the biography. Hewitt is passionate about and familiar with the landscape about which Coleridge and Wordsworth wrote, but this is the thinnest and most tangential chapter. Wordsworth is evidently a great love of the author; he appears in 11 references outside this chapter. However, the major impacts of OS maps on transportation and infrastructure, planning and economic development and nascent tourism are largely overlooked.

Chapter nine, back at the Survey, describes early setbacks and challenges. There was an early and disconcerting 1811 encounter between Mudge and the bean counters of his Age, demonstrating their failure to appreciate the value and necessity of the trigonometric survey underpinning the accuracy of the finished maps. In the same year his superior directed that maps be withheld from the public; although Mudge had advocated from the outset the public issue of Ordnance maps; they would not be available for five years, until after the Battle of Waterloo. Further, in 1811, there was criticism by the Hydrographic Survey of the accuracy of the OS's published maps where they did not match the Admiralty charts. Finally in this *annus horribilus*, Mudge's calculations for a measured base line in Lincolnshire ten years earlier were questioned in the Royal Society. The outcomes of these last two challenges are omitted in the book.

In 1816, after the hostilities, the French proposed a joint survey to extend the measured arc of triangulation. It had been established from the south of Spain and through France during Napoleon's reign and across the Channel by Roy and Cassini. The concept was to extend the arc, from its Lincolnshire terminus reached by Mudge, through Scotland to the Shetlands. The overworked Mudge relinquished the task to Colby, an evident Francophobe. The project, while a technical success, soured diplomatic relations.

With Mudge's death in 1820, Colby succeeded to the superintendence of the Ordnance Trigonometrical Survey. He introduced rigorous checking to overcome the discrepancies found earlier and initiated the first revisions where maps had already become outdated. But Colby's major contribution was in Ireland. Chapters ten and 11 capture this period.

'The Ordnance Survey's sojourn in Ireland would be a colourful saga of imperialism,

translation, cultural nationalism and local attempts to sabotage the map-makers' measurements. It was also the context in Colby developed far greater ambitions for the Ordnance Survey of Britain? (p. 240).

Originally the Irish survey was requested to record townland boundaries accurately in order to rationalise taxation. Colby and his assistant in Ireland, Thomas Larcom, conceived of a 'fully rounded national survey' that fleshed out the paper landscape? (p. 270) with a memoir for each map that included agriculture, manufactures, resources and population statistics. Although doomed to failure due to budget overruns and the difficulty for surveyors of combining measurement with interviews and questionnaires, the idea was popular and raised expectations. The large six-inch-to-one-mile scale, adopted for the original brief as the main survey scale, proved useful for recording more information. Technical advances under Colby included the heliostat and limelight which greatly facilitated the sighting of trig points over long distances in the hazy and cloudy climate, particularly when triangulating between Ireland, Great Britain and the Isle of Man. Colby, with Thomas Drummond, invented the compensation bar which eliminated the affects of thermal expansion and contraction of the measuring bars used to improve the accuracy of measurement of the Loch Foyle base line for the triangulation of Ireland. The toponymic issues encountered in Wales were as nothing, compared to the nationalism-fuelled debates over the naming of places in Ireland. For a brief time a separate Topographical Branch was set apart to sift through the conflicting versions and translations of place names, while the surveyors got on with the job.

In the last chapter, the delayed conclusion of the First Series one-inch map is described. Set back by the priority of mapping Ireland, it was further delayed by: the demand for large scale plans of towns and cities required to build sewers following the Public Health Act, 1848; the diversion by the Survey's new masters, the War Office, to Jerusalem to produce a large scale plan of for its sewers; and the poaching of staff by the new railway companies anxious to complete detailed maps of proposed routes. The Old Series of England and Wales was completed in 1870, 79 years from its commencement. The Isle of Man and Scotland were provisionally completed later, in 1873 and 1887 respectively.⁽¹⁾ Fully hachured mapping for Scotland and Ireland was not completed until 1895.

The epilogue briefly enters the 21st century to contrast the world of digital mapping, global positioning systems, geographic information systems and satnavs with the world of paper maps. The 'Free our Data' movement was active as she wrote and has subsequently affected the release of much digital information that had been costly. Ironically, 2010, the year *Map of a Nation* was published, also marked the end of map printing at the Ordnance Survey. Printed map production is now entirely out-sourced. The Ordnance Survey's main role now appears to be to maintain its database and to sell data to commercial map producers and providers of processed and interpreted map and other data.

Map of a Nation is well written and reads well. Particularly, the descriptions of the main protagonists and their interrelationships, from Roy to Colby, bring the book alive. The vision, perseverance and loyalty of the first leaders are impressive. The text is well documented; ending on p. 312, it is followed by 66 pages of footnotes, 31 pages of references, with recommended reading in bold, and an index of 14 pages.

The book has good illustrations, but the colour plates would have been improved by enlargement and placement by the related text. The line drawings are located relevantly and are clear and attractive; they are useful where words are inadequate. More illustration would have been helpful. The explanation of levelling with the alidade would have benefitted from a simple figure. The slow progress of the mapping was a constant issue between the Survey and its political masters; it would have been possible to chart the slow progress of the survey with an index map for each of the national surveys. The urgency of the military threat at the inception of the Survey is well revealed by the *ad hoc* numbering system and layout of the index map for the Old Series in England and Wales.⁽²⁾ Sheet one is London and the numbering continues east to Kent, then along the south coast to Cornwall before jumping to Central England to zig-zag up the Scottish border. The sheet size, in the most vulnerable areas, is larger than for the rest of the country. The battle of the scales (pp. 300-1), could have been made clearer by the use of map extracts, of a selected area. Likewise, the

pressure to revise could have been illustrated by the use of a revision sequence of OS maps. Given the subject matter, our national mapping organisation, more maps could and should have been used.

From this reviewer's perspective, the treatment of the Geological Survey, as an integral part of the original Ordnance Survey in England and Wales and in Ireland, is slight. In England, Thomas de la Beche, whose own pre-OS geological maps were works of cartographic art, appreciated the utility of the new OS maps:

?too much praise cannot be given to the late sheets of ... the Ordnance, remarkable not only for their general fidelity, but also for the shading of the hills; ... With these maps in his hands the geologist feels ... he is able to soar, as it were, above the country he has examined; and by combining his various observations, he may arrive at general conclusions ... to which he might never have been led without an exact document of this nature.?(3)

He was politically adroit and manoeuvred to join the OS as a geologist and eventually to establish a separate Geological Surveys of England and Wales and of Ireland. In Ireland, Colby used geology, ultimately unsuccessfully, to spearhead his plea for funds to promote his memoir project with the pilot project of the Londonderry Memoir.(4) ?Ireland gained its one-inch (map series) largely because the Geological Survey wanted it for publishing its results?.(5) For a more complete, authoritative and lively account of the influence of geologists on the Ordnance Survey of Ireland, Herries Davies is hard to beat, but he is missing from the references.(6)

The survey of Scotland, apart from the ill-tempered establishment of the arc of triangulation to the Shetlands, is overlooked. Perhaps, after the description of surveying in Wales and Ireland, it might have seemed repetitive, although it is a significantly larger and more rugged territory.

Map of a Nation is aimed at map-lovers who are interested in the characters and events which shaped the Ordnance Survey. It is well researched and entertaining. Although scholarly in its documentation, it is essentially a popular history of the key protagonists. It is more about people than maps. It covers the early and most colourful period. In a book of this length about such an important organisation, the short-comings from the geological and Scottish perspectives are minor. Given the fundamentally graphic nature of the Ordnance Survey and the readers targeted, there is considerable scope to improve the graphic design and expand the illustrations in a future edition. This should be possible within the existing substantial price. I would recommend it as an enjoyable complement that brings life and personality to the existing rather dry but more comprehensive histories of the Ordnance Survey.

Notes

1. R. Hellyer, *Ordnance Survey Small Scale Maps Indexes: 1801?1998* (Kerry, 1999), p. 43.[Back to \(1\)](#)
2. *ibid*, p. 4.[Back to \(2\)](#)
3. H. De la Beche, *A Geological Manual* (2nd ed., London, 1832), p. 545.[Back to \(3\)](#)
4. J. H. Andrews, ?The Survey of Ireland to 1847? in *A History of the Ordnance Survey*, ed. W. A. Seymour (London, 1980), p. 93.[Back to \(4\)](#)
5. R. Hellyer and R. Oliver, *One-Inch Engraved Maps of the Ordnance Survey from 1847* (London, 2009), p. 20.[Back to \(5\)](#)
6. G. L. Herries Davies, *Sheets of Many Colours* (Dublin, 1983).[Back to \(6\)](#)

Other reviews:

Guardian

<http://www.guardian.co.uk/books/2010/oct/16/map-nation-ordnance-survey-review> [2]

Independent

<http://www.independent.co.uk/arts-entertainment/books/reviews/map-of-a-nation-a-biography-of-the-ordnance-survey-by-rachel-hewitt-2155431.html>

[3]

Observer

<http://www.guardian.co.uk/books/2010/oct/17/map-of-nation-rachel-hewitt-review> [4]

Sunday Telegraph

<http://www.telegraph.co.uk/culture/books/8062215/Map-of-a-Nation-by-Rachel-Hewitt-review.html> [5]

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[3] <http://www.independent.co.uk/arts-entertainment/books/reviews/map-of-a-nation-a-biography-of-the-ordnance-survey-by-rachel-hewitt-2155431.html>

[4] <http://www.guardian.co.uk/books/2010/oct/17/map-of-nation-rachel-hewitt-review>

[5] <http://www.telegraph.co.uk/culture/books/8062215/Map-of-a-Nation-by-Rachel-Hewitt-review.html>