

Richard Preston

'The great map of Southampton': *Plan of the Borough of Southampton surveyed in 1845-6 by Sergeant W Campbell and a detachment of Royal Sappers and Miners under the command of Capt W E Yolland, RE*

The 1845-6 Southampton map was in its day the most elaborate plan completed by the Ordnance Survey. It paved the way for a generation of large-scale town maps which helped to transform the sanitary condition of the country. It is both a scintillating example of cartographic draughtsmanship and a product of those forces taking the country into the modern age. Figure 1 is a typical extract from the map.



Figure 1. An extract of the 1845-6 map centred on East Street

The chief progenitor of the map was Colonel George Henderson, born in Aberdeenshire c.1784. A military engineer, he was commissioned in March 1800 into the Corps of Royal Engineers after training at the Royal Military Academy at Woolwich. He saw service in Ceylon (1807-12), the Peninsula (1812-14), Ireland and Canada before retiring, with the rank of lieutenant-colonel, in April 1825. He was elected an associate of the Institution of Civil Engineers in May 1837. As many retired members of the corps, Henderson moved into railway promotion. He was a prime mover of the first, abortive, project to link Southampton with the capital in 1830. He was equally active in the promotion of the more successful London and Southampton Railway, responsible for raising capital in London, the north of England and Scotland. After the enabling act was passed in July 1834, he was appointed general superintendent of the line, at an annual salary of £1,000, and resident director of the company in Southampton. He continued as resident director of its successor, the London and South Western Railway. Colonel Henderson became mayor of Southampton in November 1843. It was a technocratic rather than a political appointment. Although a Conservative by instinct, he was not part of the party machine. His appointment was virtually unanimous (31 votes v 1) with Richard Andrews the sole dissident: making the point that the ward he represented, St

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Mary's, had been passed over since the Municipal Reform Act of 1835. Henderson had never faced the electorate. He had been 'pitchforked' on to the aldermanic bench - *ie* directly appointed by councillors - in November 1841.

The most pressing problem faced by the new mayor was the appalling and worsening sanitary condition of the town: a miasmatic horror that threatened both its welfare and prosperity. The epoch-making first report of the Health of Towns Commission into the state of large and populous districts published in June 1844 became his *vade mecum*. One specific recommendation could not fail to appeal to a former officer of engineers: the determination of the relative levels of the town by contour levelling. The establishment of accurate levels, ensuring that drains and sewers had the correct inclines, was a fundamental requirement of good drainage. It would also prevent the absurdity, not unknown under the unreformed system, of drains being constructed lower than the adjoining sewers. Relocation of the Ordnance Survey to Southampton in December 1841 ensured that there was a body of men, under the charge of officers of his old regiment, who were ideally suited to the job. The decision to employ such surveyors, however, lay not with the Town Council but with the Southampton Board of Improvement, established in August 1844. Henderson was not an elected commissioner but, by virtue of his unelective aldermanship, he was entitled to attend board meetings as an *ex officio* commissioner. Indeed, whilst he held the office of mayor, he was also *ex officio* chairman of each of its five constituent committees. Henderson gave notice to apply to the Board of Ordnance "to ascertain on what terms a system of contour levels might be obtained by their officers, for the purpose of accurately sewerage the town" at a meeting of the improvement commissioners on 23 October 1844. Unable to attend in person, he sent a canvassing letter to Henry Page, clerk to the board (Southampton Archives D/PM 18/2/5: 21 October 1844). He regretted his absence "more particularly as I am desirous of impressing on them [the commissioners] the expediency, & unquestionably the great economy, of having a complete set of contour levels taken & lines laid down for the future complete drainage of the town & neighbourhood. I am convinced that much ultimate expense would be saved by having this important preliminary clearly laid down, before we commence. The expense of a perfect system of contour levels & lines would probably amount to about £200 if carried on under civil surveyors; but, under the Ordnance Military Establishment, I have reason to believe that the cost would not exceed £100 - considering 3 or 4 feet to be the difference of each contour level. ... If it should be thought advisable to apply to the Board of Ordnance in this matter I shall be happy to give my aid in obtaining their assent for the levelling &c to be completed by the Survey department at the lowest possible scale of charge."

There was initial scepticism, but Henderson prevailed. His motion to apply to the Board of Ordnance was passed unanimously at the Improvement Board meeting of 20 November 1844 (with the new mayor, Captain Thomas Griffith, in the chair). Powerful allies amongst the specific (elected) commissioners spoke in his cause: Captain Peter Breton, George Laishley, Edward Palk (who offered to lend his volumes of the Health of Towns report to interested board members) and William Lankester. The only voice of doom was that of the board's own surveyor, John Doswell Doswell, a man who held almost in his very being the level of every street, lane and alley in the borough. A permanent set of levels - physically marked both by bolts of copper or iron set in the ground and by bench marks cut on buildings- was a threat to a man who held the virtual monopoly of public surveyorships in the town: surveyor to the Corporation (from 1813), to the Pier and Harbour Commissioners, to the Board of Waterworks, to the old and new

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pier companies as well as to the Improvement Board and its immediate predecessor the Pavement Board. Henderson saw the dangers: "Mr Doswell was no doubt a talented man, but he could not live for ever; his successor would not be able to get immediately at the information he had obtained, and the whole thing must be gone over again. The Commissioners themselves ought to be in possession of documents of this kind [showing contour levels], which they might put into the hands of any surveyor." The work of the Ordnance Survey had a political element, an antidote to jobbing. Is it relevant that Doswell had been employed by Henderson to survey the original London/Southampton railway line in 1830: a survey that Henderson found so unimpressive that he appointed - after consultation with Royal Engineer officers - not Doswell but Francis Giles as engineer to the London and Southampton Railway established in 1834?

The consent of the Board of Ordnance to the employment of its force at Southampton, at a cost of £120, was given in December 1844. The conditions were those laid down by Henderson, with the exception that, on the advice of Lieutenant Colonel Thomas Colby, the director of the Survey, contours were taken at slightly less demanding 5-foot intervals. The Improvement Board tried to spread the financial burden. The Board of Waterworks discussed the Improvement Board's request at a meeting on 27 December. Doswell was as ever cautious: "the town would be but very little benefited. The system was very well for persons beginning anew, especially to those who had no previous local knowledge. He thought the system was useless, unless the surveying was put into strange hands." But he admitted that the levelling was "the highest piece of science", that he could not himself do the work for the price, and in the end did not oppose a grant of £25. The Southampton Gas Company declined to contribute on the grounds that it was already in possession of levels sufficient for its purposes. The survey was begun on 4 January 1845 by a section of the Corps of Royal Sappers and Miners based in Southampton led by Sergeant William Campbell. They were under the direction of Captain William Yolland, one of the most accomplished officers ever to work for the Ordnance Survey. Born in Plympton St Mary, Devon, in March 1810, the son of a land surveyor, Yolland was educated at the Royal Military Academy at Woolwich. He obtained his commission in the Royal Engineers in 1828, later being stationed in Canada (1831-35) and Dublin. Appointed to the Ordnance Survey in May 1838, he served at their headquarters in the Tower of London before moving to Southampton in December 1841. Here he was executive officer with charge of the triangulation of the whole country: a triangulation that reached Southampton in August 1844, the very month that the Improvement Board began work. Yolland was effectively deputy to William Colby: on his retirement in 1846, Colby recommended Yolland (although only in his mid-thirties) as his successor, a request overruled by the Ordnance Board. A mathematical genius, elected fellow of the Royal Astronomical Society in 1840, Yolland was responsible for many of the computations on which the work of triangulation was based. He was promoted from First Lieutenant to Second Captain in December 1843. It was on Yolland's suggestion that the sappers took not only the contour levels but the levels of the sewers themselves. This involved, much to Doswell's chagrin, 51 openings being made to access the sewers.

The spectre of a new Ordnance Survey map did not arise until March 1845. As Colonel Henderson informed the Improvement Commissioners on 20 November 1844: "The Ordnance officer had told him that the contour lines might be laid down on the excellent map they already possessed (published by Mr Lewis) without the expense of a fresh survey." This was the map published on 1 September 1843 by John Theophilus Lewis,

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land and timber surveyor, estate auctioneer, tithe surveyor and lithographer who had moved to Southampton from Fareham in August 1840. Within three months, however, Yolland had become convinced that a fresh map was necessary. The new map, on a scale of 60 inches to a mile, was commissioned on 9 April 1845. Lewis tried to save his cartographic rights by offering the commissioners his map on an extended scale. It was to no avail: the momentum was now with the government agency. Efforts were made by the Improvement Board to recoup some of the increased cost, estimated at £400 (roughly 8 shillings an acre) for the levelling and the map combined. The Board of Waterworks subscribed £75, but both the Board of Guardians and the Gas Company refused any financial help. A Town Council meeting on 16 July considered a motion from Colonel Henderson (seconded by Joseph Lankester) that £50 be subscribed to the map, on the understanding that a tracing be furnished to the council. The vote was held amongst confusion. Both an amendment (moved by John Traffles Tucker and William Le Feuvre) to Henderson's motion and the motion itself were negatived by one vote: owing, it was said, to Councillor John Hole, who supported the motion, accidentally voting against it. The Board of Waterworks contribution was still unpaid in November 1847.

Captain Yolland estimated that six to eight months were needed to complete the work. In fact, the work occupied 21 months. His evidence before the Metropolitan Sanitary Commission in 1848 suggests that between ten and twelve men were required for the Southampton survey. A staffing commitment it was difficult to maintain given the exodus, to all parts of the country, of Ordnance surveyors to work on the burgeoning number of railway projects. Rachel Hewitt (*Map of a nation: a biography of the Ordnance Survey*, published in 2010) calculates that 287 Ordnance Survey employees left during the 'railway mania'. Others were granted a two months furlough to profit from the windfall (*Hampshire Advertiser*, 18 October 1845). On an opposite tack, the demands of the 6-inch survey of Britain, then in full progress, caused the Southampton survey to evolve into a training exercise, it being, to quote Yolland's evidence in 1848, "principally done in the process of instructing a number of military men for the general survey of the country." Such exercises are invariably expensive of time.

The work of the survey itself had an irresistible tendency to grow. An independent report on the sewerage of Southampton was made in May 1845 by John Roe, surveyor to the Holborn and Finsbury sanitary authority and an expert witness before the Health of Towns Commission. Colonel Henderson had been instrumental in the appointment, seen by many as an affront to John Doswell Doswell. It was a distraction for Yolland's stretched team that they were obliged to provide Roe with a tracing of Lewis's 1843 map annotated with the elevations and outlets of sewers, the situation of hydrants and acreages. The exact delineation of borough and parish boundaries proved further time-consuming problems. Permission was given in January 1846 to consult the old maps, deeds and the manuscript of Dr Speed's history of Southampton in the corporation chest. Nevertheless, many of the town-centre parochial boundaries remained a mystery. The most intractable was that between St Michael's and St John's. Written requests from Yolland to Doswell remained unanswered, although Doswell claimed rather unconvincingly to have replied in person. It was an unhelpfulness that led to calls for his resignation at the Improvement Board meeting on 20 January 1847 (Joseph Hill: "Mr Doswell was a servant of the Board, and if he did not perform his duty, some one else must"). Of more concern to the Town Council were Yolland's queries on the exact boundary of the borough, especially at Acorn Bridge in the west and around Bannister's Farm. They raised fundamental shibboleths. Letters written in April and

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December 1844 were referred to the Lease Committee. The Town Clerk was instructed to search the corporation muniments, to uncover details (unsuccessfully) on a court case at Salisbury in 1651 on which the Bannister's Farm boundaries were thought to hinge and to consult the county authorities at Winchester. There was one expense, however, that Yolland refused to countenance. In January 1846 the Improvement Board took up the problem of inconsistency in the naming of streets and the numbering of houses: a confusion that saw, to take an extreme but not untypical example, four no.10's in St Mary's Street. In November, Captain Yolland offered to put the 60 inch map - a scale sufficiently large to show "the number of every house in the town" - at the disposal of the commissioners should they make a general review of the streets. The Board's response was that Yolland himself take on the responsibility. Fearing the expense Yolland refused, but did consent to insert house numbers wherever there was "any regularity in the numbering."

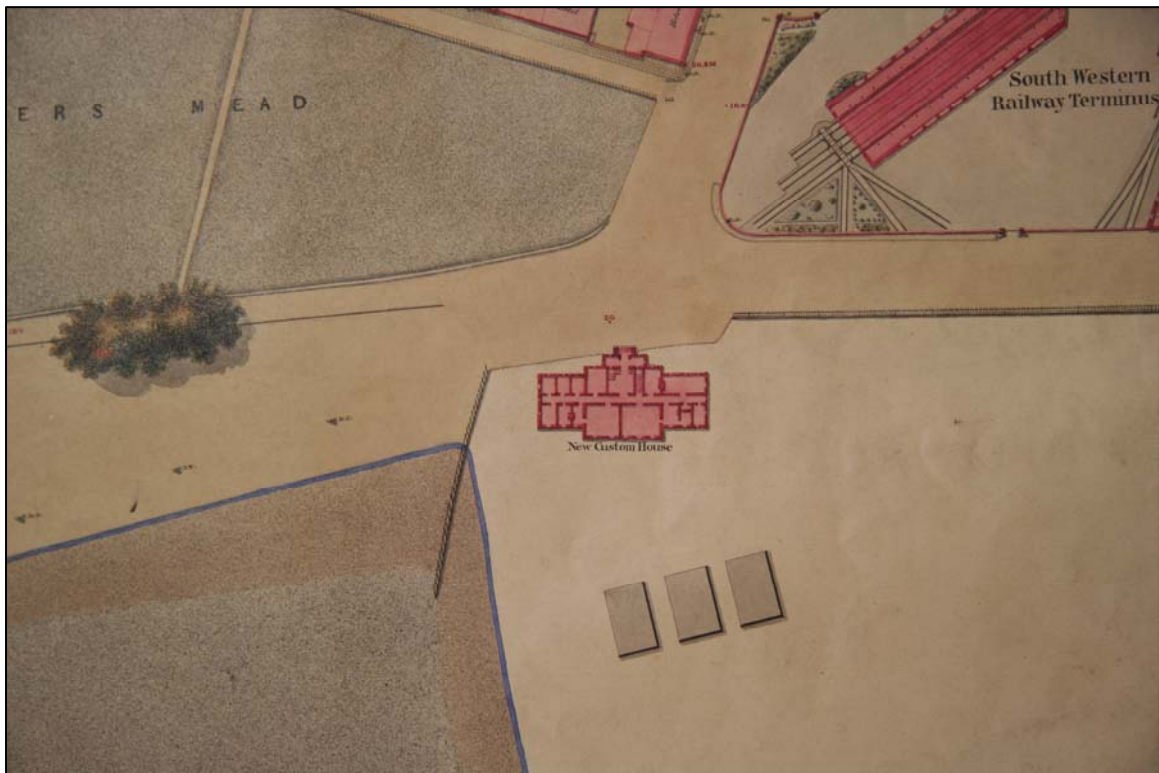


Figure 2. The new Custom House on Canute Road, drawn as though it was completed

The map was completed, as far as Doswell's evidence on parish boundaries and acreages allowed, in late January 1847. It was handed over to the Improvement Board by Sergeant Campbell on 31 March. The final delay stemmed from the decision of the board to have the 33 sheets of double elephant drawing paper bound into an atlas. The work was entrusted, under Yolland's supervision, to John Arrowsmith, a London-based mapmaker who in 1834 had published the monumental 50-sheet *London atlas of universal geography*. The final cost was almost £450: £400 for the main contract; £15 for extra work; 24 guineas for the binding (split equally between Arrowsmith and the Ordnance Survey); and - not paid until 1848/9 - £7.17s.6d. to Doswell for information provided to Yolland in 1845. An attempt to raise a subscription to reward the men responsible for the map - gravely underpaid in the view of many - failed as the intended honour was declined by the Ordnance authorities on grounds of military discipline. The map was not only a record of the existing state of Southampton. It also recorded building

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works then in progress: a plan (including internal staircases) of the new Custom House, of which the foundations were hardly then laid (figure 2), a plan of the railroad then under construction round the graving dock and the Riding School on Bedford Place, not opened for instruction until 16 August 1847. A potential pitfall for the unwary historian. Contemporaries were in awe at what was regarded as the cartographic wonder of the age. "It is the most artistic display of ornamental surveying we have ever seen: the stone work of the pavement, the different styles of public buildings, the present and the outline of the removed town wall, the masonry of the graving dock, the very undulations of mud, and small runs of water into it from the coast, the gardens even of private houses, to say nothing of the magnificent trees and shrubberies on the Common, and all delineated with a minuteness of detail and beauty of colouring unexampled in any town map in England" (*Hampshire Advertiser*, 3 April 1847, in its report on the 31 March Board meeting). It fulfilled its original intent as a utilities map, showing contour levels, altitudes above the datum plane, fire plugs [water hydrants], sewer grates, the lids of water and gas pipes and lamp posts. The internal arrangements of places of worship were shown: a revealing complement to the 1851 religious census (figure 3).

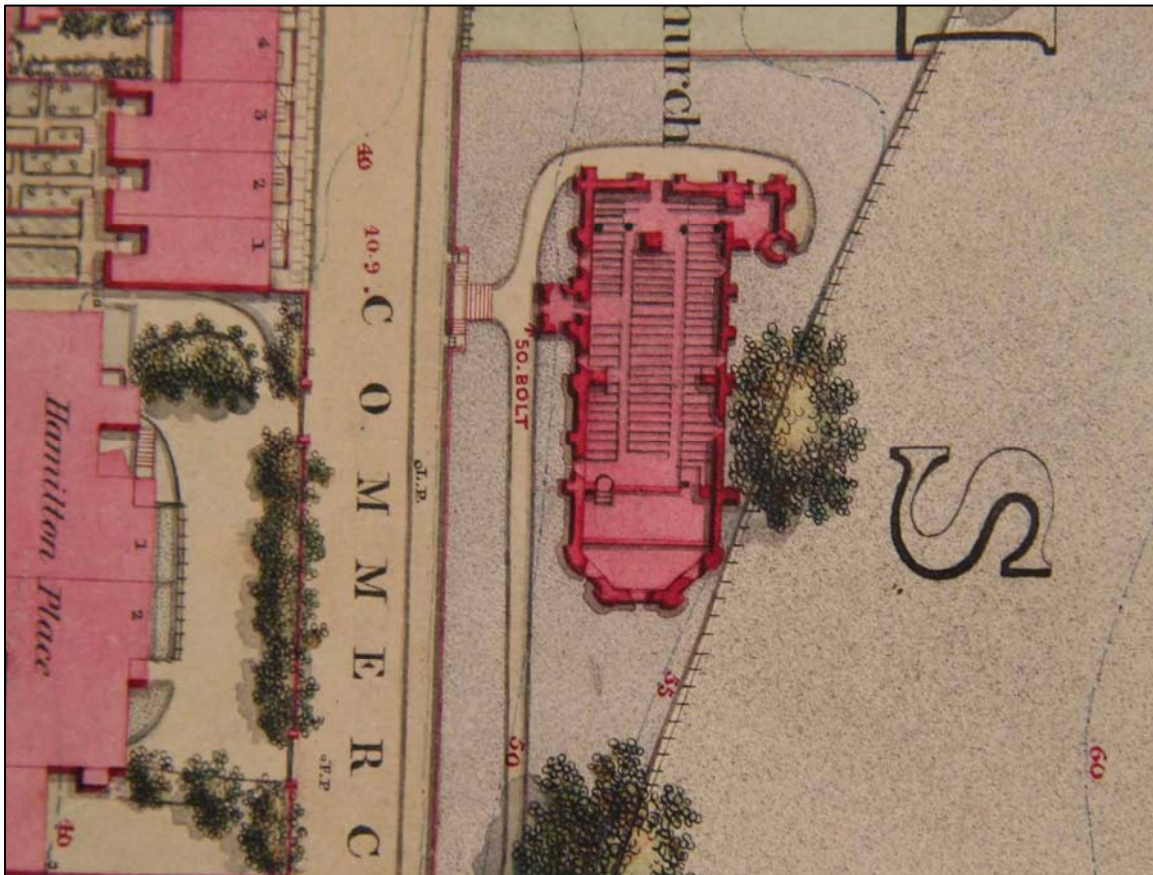


Figure 3. St Peter's Church, Commercial Road, with its internal layout laid bare

John Rushworth Keele (chairman at receiving meeting) thought the map to be "the most valuable document the town possessed". And herein lay its vulnerability. It was not designed for day-to-day use. Failure of the Corporation to subscribe to the work in July 1845 meant that there was no workable tracing of the map. A derived 6-inch map - to act as an index, to show the town in one extent, and on which new streets or other alterations could be drawn - would have answered the purpose. Captain Yolland urgently pressed this solution on the Southampton authorities, and Sergeant Campbell exhibited a

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specimen 6-inch map at the 31 March board meeting. But neither the Board nor the Corporation was in the mood to sanction further expense. Their shortsightedness was exposed by the exhibition of a hand-drawn 6-inch version by one of the original draughtsmen (Charles Holland) as part of the Ordnance Survey's gold-medal winning contribution to the 1851 Great Exhibition. The reaction of the *Hampshire Advertiser* was no doubt typical: "We can only regret that our own superb map has not a similar one as a frontispiece [*sic*] and index, which would greatly enhance the value of the larger map." The map itself, bound in bureau folio, is enclosed in a magnificent velvet-lined, embossed leather and buckram presentation case. The whole is protected by a patent Bramah lock. It lay not in the surveyor's or the engineer's department but with other corporation treasures in the muniments room. It still lies in Southampton Archives, although modern black and white dyeline copies provide an acceptable alternative. Three town centre sheets are reprinted in colour, at a reduced scale of 51 inches to the mile.

Six of those responsible for the 1845/46 map are known by name. Captain William Yolland was director of operations. Sergeant William Campbell superintended those on the survey. The draughtsmanship was the work of four men: Second Corporals Charles Holland and George Vincent and civil assistants Patrick Joseph Hogan and Mr A Maclachlan. We can put flesh on the bones of four of these people.

Captain William Yolland was, as we have seen above, a newcomer to the town in December 1841. Marriage on 18 July 1843, at All Saints Church, to Ellen Catherine Rainier gave him entry to the ruling *elite* of the town. A position which no doubt eased his relations with the members of the Improvement Board. Ellen (born April 1819) was the youngest daughter of the late Captain Peter Rainier, RN, a naval hero of the Napoleonic Wars, particularly of the Java Campaign of 1806-7, a captain at the age of 21, a Companion of the Order of the Bath (1815), naval aide-de-camp to William IV (1830) and commander (1831-5) of the *Britannia* (120 guns). Rainier was in Southampton in 1820, the subject of an anti-Chamberlayne political satire (Southampton Archives D/Z 1022/1/1). Taking a house in Rockstone Place, he became a member of the corporation: junior bailiff in 1827, senior bailiff in 1828, sheriff in 1829 and an alderman in 1835. He died in Southampton in April 1836, survived by his widow Elizabeth. Five daughters were born to William and Ellen in Southampton between June 1844 and January 1852. William's subsequent career can be followed in the *Oxford dictionary of national biography*. He was director of the survey of London made between 1848 and 1850 for the Metropolitan Commission of Sewers, working closely with Edwin Chadwick. In 1854 he left the Ordnance Survey to become an inspector of railways under the Board of Trade, becoming chief inspector of railways in 1877. He was one of the three commissioners of enquiry into the Tay Bridge disaster of 1879. He was promoted to First Captain in the Royal Engineers in March 1847 whilst still in Southampton. On his departure to Ireland in November 1852, he received an address from Southampton Corporation acknowledging his work for the welfare of the town and his uniform readiness, courtesy and kindness on all occasions. He resigned from the army, with the rank of brevet colonel, in October 1863. Yolland was elected a fellow of the Royal Society in 1859 and a member of the Society of Arts in 1860. He died in September 1885.

Sergeant William Campbell was born in Ireland c.1806. He joined the Corps of Royal Sappers and Miners in 1829. Although only a junior non-commissioned officer, Campbell was appointed instructor in surveying and levelling to the inspectors of national schools, part of the reform of Irish education under Lord Stanley. This was valuable

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experience for his later training role in Southampton. He moved, with others of the Irish survey, to Southampton in the early 1840s. He became effectively deputy to William Yolland: in charge both of the correspondence, accounts and payment of those employed in the principal triangulation and of the calculation and preparation of the initial spirit-levelling. Working again under Captain Yolland, Campbell had charge of the construction and preparation of the block-plan of London for the Metropolitan Commissioners of Sewers. He also had the superintendence, under Captain Beatty of the Royal Engineers, of the 10- and 12- foot plans of seventeen other towns surveyed for local boards of health. Away from cartographic matters, Campbell produced reports in November 1849 and April 1852 on the feasibility of supplying Southampton with pure water from Otterbourne Springs (Southampton Archives SC/AH 2/2/10). He gave expert evidence before the subsequent parliamentary enquiry into the Southampton Corporation Bill. He was discharged from the Ordnance Survey in July 1852 with a pension, an annuity of £10 *per annum* and a silver medal for 'meritorious service'. In civilian life he became cashier of the Peninsular and Oriental Steam Navigation Company, a plum job with a salary of £210 - later raised to £300 - *per annum*.

Second Corporal Charles Holland of the Corps of Royal Sappers and Miners was the leading draughtsman on the 1845-6 map. Born in Ireland c.1808, Private Holland worked initially on the Irish survey. After transferring to England, he became a draughtsman, along with Private Hogan, on the prestigious survey of Windsor, 1843-5, commissioned by Queen Victoria. This became a blueprint for the Southampton map. Prince Albert took a personal interest in the project, frequently visiting the Ordnance Survey office in Castle Street. He presented each of the privates with a handsome, inscribed mahogany case of mathematical instruments, comprising compasses, circles, ivory-handled steel pens for ruling straight lines, ivory scales and rules, as "a mark of his approbation for merit, in the execution of a Survey and Drawing of Windsor and its vicinity". Holland was promoted Second Corporal in 1845. Pensioned in April 1847, he returned as a civilian draughtsman to the Southampton office. Quartermaster Thomas Connolly, author of a history of the Royal Sappers and Miners published originally in 1855 (second edition of 1857 found online at <http://google.com/books>) thought Holland "perhaps the best man of his class in the department; ... his drawings are always executed with fidelity and beauty. Frequently their neatness, and the richness of colouring and ornament, give them an effect truly artistic and pictorial." A talent that was exploited in the 6-inch map of Southampton displayed to an international audience at the Great Exhibition of 1851.

Private Patrick Joseph Hogan, born in Ireland c.1805, had little of the military about him. A good, easy man, he served nearly twenty years - seventeen of them in Ireland - in the Corps of Royal Sappers and Miners without promotion: "unqualified to command" in the words of Quartermaster Connolly. He was discharged, with a pension, in January 1845, being retained at Southampton as a civil assistant. Hogan was by temperament and instinct an artist. He had gained prizes as an artist at Trinity College, Dublin. Whilst working on the survey of Windsor, he produced two Indian ink sketches, *Old oak above Adelaide Cottage* (1843) and *Queen Victoria's Tree in Windsor Forest* (1845). Greatly admired by Queen Victoria, herself a keen etcher, both are still in the royal collections in Windsor Castle. The former was exhibited at the Paris Universal Exhibition of 1867. Hogan emigrated to New Zealand in 1849. Ironically for a man of such little military bearing, he went on assisted passage in the *Oriental Queen* as a member of a detachment of Royal New Zealand Fencibles. He settled initially in Onehunga on Auckland Bay, one of a series of pensioner settlements created to protect European

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settlers from the perceived Maori threat to the south. Here he became *de facto* a military artist, producing sketches of military residences, army barracks, settlements of new arrivals and Maori camps. He advertised art classes in February 1850 and is believed to be the first person to have taught art in New Zealand. Hogan moved to Australia in March 1858, settling in Sydney. He took a position in the New South Wales Surveyor-General's Department, but continued his love of drawing. He exhibited at the first exhibition of the New South Wales Academy of Art in 1872 and at the Metropolitan Intercolonial Exhibition in 1874. Patrick Hogan died in 1879 after a full life as surveyor, draughtsman, lithographer, artist and teacher.

This vibrant colony of government surveyors, draughtsmen and engravers in north Southampton did much to enrich the scientific and cultural life of the town in the mid-nineteenth century.