



Historic England

The Rotunda (former Royal Artillery Museum), Woolwich Common, London Borough of Greenwich: History, Structure and Landscape

Emily Cole, Susan Skedd, Jonathan Clarke and Sarah Newsome

Discovery, Innovation and Science in the Historic Environment



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LONDON BOROUGH OF GREENWICH:
HISTORY, STRUCTURE AND LANDSCAPE**

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ABBREVIATIONS

DOE	Department of the Environment
EH	English Heritage
HE	Historic England
HEA	Historic England Archive
ODNB	Oxford Dictionary of National Biography
OS	Ordnance Survey
PSA	Property Services Agency (part of the DOE)
RA	Royal Archives
RAHT	Royal Artillery Historical Trust
RAI	Royal Artillery Institution
RAM	Royal Artillery Museum
TNA	The National Archives

Cover Image: The Rotunda from the south-west on 9 April 1975, following the completion of the extensive restoration programme. (© Crown copyright. Historic England Archive, ref. p_g21156_003)

SUMMARY

The Woolwich Rotunda is a structure of international significance, listed grade II*. Designed by the architect John Nash, it began life as a temporary building constructed in 1814 for the Prince Regent (the future George IV) in the gardens of Carlton House, and utilised as a ballroom for the Wellington Fête of that year. In 1818, the structure was dismantled and transferred to Woolwich, for the use of the Royal Military Repository. The Rotunda was rebuilt and reopened on its new site as a museum in mid-1820, intended for use both by military men and civilians. Its interior was formed of a single large space filled with military collections, while the Rotunda was carefully sited at Woolwich, forming part of the Royal Military Repository training ground. The building remained a museum until the turn of the twenty-first century: the bulk of the Rotunda's collections were transferred to Firepower, the new Royal Artillery Museum, opened in Woolwich in 2001. Following the closure of Firepower in 2016, the collections have been moved to a new museum in Wiltshire, due to open in 2022. Emptied of its exhibits, the Rotunda is currently without a function, and has been on the Historic England buildings at risk register since 2007. This report aims to inform discussions about its future.

CONTRIBUTORS

The text of this report was written by Emily Cole, Susan Skedd and Jonathan Clarke (then of the English Heritage Architectural Investigation team) and by Sarah Newsome (Archaeological Investigation & Survey). Initial editing was undertaken in 2008-9 by Gordon Higgott, also of the EH Architectural Investigation team, and Alan Johnson of the Government Historic Estates Unit, with graphics produced by Andy Donald and photography by Derek Kendall and Patricia Payne. It was issued as an interim report in early 2009 (see below).

In 2020, to inform discussions about the future of the Rotunda and the associated Repository Woods (see Preface), Wayne Cocroft (Senior Archaeological Investigator at Historic England) asked that the interim report of 2009 be finalised and incorporated into the Historic England Research Report Series. In order to achieve this, further changes and edits have been undertaken by Emily Cole, along with the gaining of permissions to reproduce the various images. Desktop publishing has been undertaken by Rachel Forbes.

ACKNOWLEDGEMENTS

As is noted below, the work resulting in this report was undertaken a number of years ago. The report issued in 2009 did not contain acknowledgements, aside from limited thanks given in Alan Johnson's introduction. It would be impossible now to adequately list all the individuals and organisations who provided support and advice, but they certainly included, as well as the various authors and editors: Roger Bowdler, the Royal Collection and its archives at St James's Palace, the staff at the Ministry of Defence and Firepower, the Royal Artillery Museum, Lt Col. Michael Edwards, the Royal Artillery Historical Trust, The National Archives, the staff of the Survey of London (especially Peter Guillery), and the staff of the Brighton Pavilion. For their help in bringing this report to publication in 2020, thanks are due in particular to Nigel Wilkins of the Historic England Archive, Joanna Smith, Wayne Cocroft, Jon Clarke, Sarah Newsome, and all the staff of the various archives, libraries and organisations who kindly provided images and permitted their reproduction.

ARCHIVE LOCATION

Historic England Archive, The Engine House, Fire Fly Avenue, Swindon SN2 2EH.

DATE OF RESEARCH AND INVESTIGATION

Research and investigation of both the Rotunda and the Repository Grounds took place in phases between 2002 and 2009, with initial site visits taking place on 20 March 2002 and 12 March 2003.

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PREFACE - EMILY COLE, 2020

This study of the Rotunda was originally issued as an interim research report by English Heritage in 2009, under the editorship of Gordon Higgott. It was the result of a process of research and investigation that began around 2001, when Alan Johnson of the EH Government Historic Estates Unit commissioned some work from what was then the Historical Analysis & Research Team. Emily Cole undertook that first phase of research, beginning with the Rotunda's history at Carlton House, completing an internal English Heritage report on this subject in April 2002 (revised and reissued in July 2008).

In subsequent years, further work was undertaken on the Rotunda's history at Woolwich (by Emily Cole and Susan Skedd), on the building's structure (by Jonathan Clarke) and on its landscape setting (by Sarah Newsome). Jonathan Clarke published an article on the building in *Construction History* in 2005/6, and an archaeological survey report by Sarah Newsome, Jonathan Millward and Wayne Cocroft on the Repository Woods was published in the English Heritage Research Report series in 2009 (no. 14-2009).¹ All of this work fed into a new Survey of London volume on Woolwich, then in preparation by colleagues at English Heritage; the resulting volume was published in 2012.²

The interim Rotunda report completed by English Heritage in 2009 was intended for limited and predominantly internal use; it was never published online and was not part of the English Heritage Research Report Series. As is noted below, the report served to inform discussions then underway about the future of the Rotunda and surrounding areas in Woolwich. It was intended that the material in the report be subsequently issued in the form of a book, but this project never went ahead. As a result of the interim report and the associated report on the Repository Woods, the linear training fortification to the east side of the Rotunda was scheduled in 2010, while Repository Woods was designated as a grade II-listed park and garden in 2011.

In the years following the completion of the interim report, further changes took place in Woolwich. In 2016, the government announced that the Napier Line compound, roughly corresponding to the former Royal Military Repository grounds, was to be vacated and the site offered for sale by 2028. Firepower, the Royal Artillery Museum, moved to Larkhill in Wiltshire in the same year, 2016. These changes continue to the present day, and as a result of ongoing discussions between Historic England and the Ministry of Defence, it has been requested that the report on the Rotunda be made generally available.

The report published here is, in terms of its content (text and images), largely identical to that completed in 2009. Only limited additional research has been undertaken, primarily on the Rotunda's lead roof – though there is certainly scope for future work and findings about the building's history, especially in Woolwich. Only minimal changes have been made to bring the work 'up to date' – for instance, the name English Heritage has generally not been changed to Historic England, apart from in illustration credits and notes, for clarity and accuracy. Furthermore, little attempt has been made to reduce areas of duplication between the separately

authored chapters. The chief task has been to restructure the text slightly (creating separate sections for history, structure and landscape), to make some light edits to ensure consistency and to meet HE's current standards, to gain consent for the reproduction of images, to ensure captions are accurate, and to reformat the report as part of the Historic England Research Report Series.

It seems fitting that this important report will finally be widely available in 2020 – exactly 200 years since the Rotunda was opened to the public as a museum in Woolwich. It is a building of international significance, and its story and significance deserves to be better known and appreciated.

INTRODUCTION - ALAN JOHNSON, 2009

Originally designed by the architect John Nash as a marquee in the garden of Carlton House in London for a ball given in honour of the Duke of Wellington by the Prince Regent in July 1814, the Woolwich Rotunda found a permanent home when it was re-erected in the Woolwich Repository Grounds in 1818. Strengthened internally by a central sandstone column and externally by brick walls, it became a museum for small-scale models of military equipment and fortifications. Practice trenches and gun emplacements were installed nearby. When the Repository Grounds ceased to be used as a training school for the Artillery in 1859, the Rotunda acquired a new role as a museum chronicling the history of artillery in Britain and abroad, and its roof was clad in lead. The architectural and historic significance of the building was first recognised in 1973 by its inclusion at grade II in the statutory list of buildings for the London Borough of Greenwich; in 1990 it was upgraded to II*, and by then it was also part of the Woolwich Common Conservation Area.

The historic departure of the Royal Artillery from the Woolwich Arsenal in 1994 and the opening in 2001 of Firepower – the new Royal Artillery Museum at the Arsenal – brought to an end the 180-year history of the Woolwich Rotunda as a museum of artillery. Now, with the imminent move of the reserve collection in the Rotunda to Firepower and the transfer of responsibility for the building to Defence Estates, informed decisions are needed on its repair and future use. Such decisions cannot be made without a full understanding of the history, character and setting of the building, and an appraisal of its overall significance. An underlying premise of this report, written by three historians and an archaeologist in English Heritage's Research Department, is that although the building may be perceived today as an isolated structure, it is in fact the most conspicuous surviving element of an historic range of military training features dating from the early nineteenth century.

PART ONE: HISTORY

THE ROTUNDA AT CARLTON HOUSE, 1814-1818 - EMILY COLE

Historical Context

The Napoleonic Wars

The year 1814, when the Rotunda was designed and erected in the gardens of Carlton House, was a time of widespread jubilation. After twenty years of war with France, Europe had finally been freed from the tyranny of Napoleon Bonaparte (1769-1821) – or so it was thought.³

The period 1793 to 1814 had been one of continual turmoil, both national and international. The conflict with France – usually divided into two parts, the wars of the French Revolution (1793-1801) and the wars of the French Empire (1803-15) – had terrified the crowned heads of Europe. Despite a number of victories for Britain and her allies (including the famous Battle of the Nile of 1 August 1798), the power of Napoleon increased steadily in the later years of the eighteenth century. The great naval base at Toulon fell as early as 1793, Belgium and Holland were overrun in 1794-95, and Egypt came under French rule in 1798-1801. Coalitions set up variously between Britain, Austria, Prussia and Russia failed, and by 1801 Britain was on the defensive, and without continental allies. The fourteen-month peace between France and Britain, made formal by the Peace of Amiens of March 1802, served principally as a much-needed respite for both countries, and was not seen as anything other than temporary.

The breach finally came in May 1803, when Britain broke the Peace of Amiens by refusing to evacuate Malta. Napoleon Bonaparte, whose French army had now grown stronger than ever, proclaimed himself Emperor, and began to make serious preparations for the invasion of England. At sea Britain remained supreme – Lord Nelson's Battle of Trafalgar (21 October 1805) was the last in a series of great naval victories – but the situation on land was far from encouraging. In August 1805 Napoleon turned east, capturing Vienna and defeating the Austro-Russian army at Austerlitz. After a short comeback, both the Russian and the Prussian armies were crushed at the twin battles of Jena and Auerstädt in October 1806.

In spring 1808, Napoleon invaded Spain, and his brother Joseph was made king. On 2 May the people of Spain and Portugal rose up against the French, and appealed to Britain for help. Thus began the Peninsular War, one of the many conflicts of the early 1800s, and one that proved vital, not least because it was led by Sir Arthur Wellesley (1769-1852). After the death of Nelson in 1805, Wellesley – Marquess and later Duke of Wellington – became Britain's foremost public hero, and his military career was followed avidly by the British public. Wellington was based in Spain and Portugal for six years without leave, and took enormous pride in his mighty Peninsular Army.

After a steady stream of victories, the tide finally turned in 1812. Napoleon, who had invaded Russia, was fighting a war on two fronts, and the allies took the offensive. In 1813, Wellington and his army advanced 500 miles, from Portugal well into France, and there were notable victories in Germany and Russia. There were murmurs of peace, but by the Treaty of Chaumont of 1 March 1814, the four great powers – England, Russia, Prussia and Austria – agreed to continue fighting until Napoleon was overthrown. The Allied armies of Russia and Prussia finally entered Paris on 31 March 1814. Less than a week later, on 6 April, Napoleon abdicated and left France for the island of Elba. On 18 April a convention was signed by which all hostilities ceased, and on 24 April a triumphant Louis XVIII returned to Paris. The subsequent Treaty of Paris, signed on 30 May, confined France to her boundaries of 1792.

The peace that was – as we shall see – so gloriously celebrated proved premature. Napoleon was not to be contained by Elba, and on 26 February 1815 sailed once more for France. The Hundred Days, the last phase of the Napoleonic Wars, was underway. By 20 March Napoleon was nearing Paris, accompanied by jubilant soldiers, and was reinstated as head of state. The allies were caught off-guard, and a ‘scratch force’ was assembled under Wellington, who was appointed commander of the British and Hanoverian forces on the Continent.⁴

However, Napoleon’s star was truly on the wane by this time; he was surrounded by enemies plotting his downfall, and on 13 June 1815 Wellington was able to write that ‘I think we are now too strong for him.’⁵ Forced to fight, Napoleon marched into modern-day Belgium on 14 June. The subsequent Allied victory on the field of Waterloo on 18 June remains one of the greatest triumphs of British history, and effectively marked the end of the Napoleonic Wars. Bonaparte was sent to St Helena in the south Atlantic, where he spent six miserable years, before dying at the age of fifty-one.

The Prince Regent

The situation in England during the years of the Napoleonic Wars was far from stable. George III (1738-1820), who acceded to the English throne in 1760, had begun to show signs of derangement as early as 1765. His illness worsened from 1804, and by 1809 the King was blind, living in seclusion and incapable of fulfilling his royal duties. In November 1810, George was fastened into a straitjacket, and remained constrained for eleven days. Recovery from his disease, now understood to have been porphyria, seemed impossible.

The Regency Bill, passed on 5 February 1811, placed George III’s eldest son, George (1762-1830), Prince of Wales, in the position of ruler. His powers were limited for the first year, allowing for any recovery on the part of his father, but in early 1812 the Prince assumed the full power of the royal prerogative. George III is said to have felt unhappy about the Regency – his eldest son was widely known for his extravagance, huge debts and loose habits – and certainly, there was widespread discontent during the Regency period, 1812 to 1820. At the popular level, the Prince Regent was widely disliked, and was seen to have strengthened the divide between rich and poor. The public was, in particular, appalled by the Prince’s treatment of his wife, Princess

Caroline of Brunswick (1768-1821), and his daughter Charlotte (1796-1818). The marriage of George and Caroline had been a disaster from the outset, and the Prince kept a number of mistresses, including Maria Fitzherbert. In 1797, Caroline left the Prince, but was not allowed to take her daughter Charlotte. Although her own habits were far from respectable – she had a number of affairs, and is said to have borne illegitimate children – Caroline refused to grant a divorce. George, for his part, refused to be in the same room as his wife, and only allowed her weekly (later fortnightly) visits to their daughter. By 1814, the year in which Napoleon abdicated, relations between the Prince and Caroline were worse than ever, and popular sympathy for the Princess reached a pitch. The Prince was widely satirised, not least by John Wolcot ('Peter Pindar'), the author of a series of notoriously offensive poems.

Nevertheless, despite these domestic difficulties, the Prince did much to raise the status of England, and the Regency period has been referred to as 'one of the greatest and most glorious epochs in our history'.⁶ George was a great patron of the arts, a lover of architecture, sculpture and painting, and encouraged scientific development and innovation. The climate of the times also instilled in the Prince a love of militaria. As a youth, he had high hopes of serving on the field – hopes which were quashed by the King's insistence that he have no involvement with the Army, except in a ceremonial capacity. Instead, George watched his brothers – especially Frederick, Duke of York – rise to senior military positions, while he languished at home. In January 1793, George III finally allowed his eldest son a concession. The Prince was appointed Colonel-in-Chief of the 10th (Light) Dragoons, and the commission was backdated to 1782. However, this was devised as 'little more than a ceremonial sop, which enabled him to substitute real soldiers for toy ones'.⁷

Throughout the 1790s and early 1800s, the Prince continued in his frustrated war-games. In 1794, he staged a mock-battle at Brighton, leading his regiment against a notional enemy, and in 1799 spent £178 on regimental wear for himself.⁸ The Prince encouraged artists to portray him in military guise; in 1782 Thomas Gainsborough produced a full-length portrait of the Prince in a specially-designed uniform, in 1784 Joshua Reynolds showed the Prince with drawn sword, about to mount his horse, and in 1798 William Beechey produced a similar equestrian painting. As the years passed, and the fighting with the French army continued, George's obsession with militaria deepened. Berkeley Paget, who witnessed a regimental review of the 10th Dragoons in 1811, commented of the Prince that 'I fancy his whole soul is wrapped up in Hussar saddles, caps, cuirasses, and sword belts'.⁹ Later in life, even in the presence of Wellington himself, George would famously claim to have fought in person at Waterloo.

After the renewal of hostilities in 1803, and the increased threat of invasion by Napoleonic forces, George began to cast himself ever more actively in the role of popular hero. He had long compared himself with Edward (1330-76), the Black Prince, who had commanded with Edward III at Crécy in 1346, set up the Order of the Knights of the Garter, and became one of the outstanding leaders in the One Hundred Years War.¹⁰ From the early years of the nineteenth century George's obsession was transferred to Napoleon.¹¹ The Prince tried to exceed his rival's

example in every way possible; for example, John Nash's Regent's Park terraces were partly conceived in relation to Imperial Paris.

The Prince saw himself as one of the great victors of the war with France, and after Napoleon's abdication in April 1814, convinced himself that he had been the inspiration behind the coalition of the four great powers. Letters of flattery flooded in to the Prince. Elizabeth, Duchess of Devonshire, wrote on 14 April 1814 congratulating George 'on the glorious and happy events which have taken place and to which your own firmness has so largely contributed', and the Prince's sister, the Queen of Württemberg, wrote on 16 April that he must 'feel delighted to have assured the Crown of France to its ancient sovereigns'.¹² Four days later, the Hereditary Prince of Orange wrote that 'I cannot fail to congratulate your Royal Highness upon the happy and extraordinary events which have taken place in France, since I now consider your Royal Highness's great work as finished and the liberty of Europe consolidated ... What a glorious event for your Royal Highness to whose firmness we owe all this and whom the whole of Europe is obliged to acknowledge as his deliverer'.¹³

1814: The Year of Celebration

It was in his role as victor that the Prince Regent threw himself wholeheartedly into the rejoicings of summer 1814. All eyes were upon Britain, and thus upon its ruler, and of this he made good use. Such an immense opportunity for self-aggrandisement had not come George's way before, and soon after 8 April, when the Prince heard of Napoleon's abdication, the plans for celebration began. An invitation to Tsar Alexander I of All the Russias to visit London, made in early 1814, was quickly extended to all of the Allied rulers, their ministers and generals, and their arrival was set for June. A letter from Theodore Lawrance to Colonel McMahon of 7 May 1814 shows what such a visit meant. It was 'a visit flattering to the Kingdom at large & to His Royal Highness the Regent in particular, unparalleled in the pages of history, and which ... tends to gild the setting sun of our beloved & aged sovereign & the rising of that of his son with unexampled lustre'. Lawrance was certain that the Prince Regent would wish to show his illustrious visitors 'every specimen of our exalted national situation in arts, arms, architecture, & public benevolence'.¹⁴

London was illuminated for three successive nights from 11 to 13 April. The *Gentleman's Magazine* recounted how 'the extensive front of Carleton-house was covered with light. The colonnade was wreathed with continued festooning of flame-coloured lamps. On the architrave blazed in large characters the names of Austria, Prussia, Russia, and England: in the centre, the motto, "Vive les Bourbons". Immediately above was the name of "Louis XVIII" and on the summit, crowning the whole, a transparency of Genii supporting the Crown of France'.¹⁵ The Bourbon king, after an exile from France of twenty-five years, was triumphantly paraded through London by the Prince Regent, and returned to France on 24 April to become Louis XVIII.

On 6 June, the Allied Sovereigns reached Dover. Tsar Alexander, then the most powerful absolute ruler in Europe, delighted the crowd by proclaiming 'God

be praised! I have set my foot upon the land which saved us all'.¹⁶ Along with Alexander came King Frederick William III of Prussia, and their two respective commanders, Prince Platoff and Marshal Blücher. Prince Metternich represented Austria, the Emperor Francis not being able to attend. Robert Southey, then Poet Laureate, composed a verse on the occasion, *Carmina Aulica*, which celebrated 'This memorable time,/ When Peace, long absent, long deplored, returns!'.¹⁷

On 7 June, the Allied Sovereigns reached London, then reputed to be the wealthiest city in the world. Doris Leslie, in her *The Great Corinthian* (1952), recounts how 'never had been seen or heard such a tramping of feet', and 'such a display of bunting and dazzle of lights, coiled like a glowing serpent round the city'.¹⁸ There were vast pilgrimages from all over the country of people anxious to see Napoleon's conquerors; London's population is said to have increased by 200,000 by the time of the visitors' arrival.¹⁹

Nonetheless, the three-week visit did not get off to an ideal start. Alexander refused the Prince's offer of state accommodation at St James's Palace, preferring instead to join his sister the Grand Duchess Catherine of Oldenburg, who was already based at Pulteney's Hotel in Piccadilly. The public flocked to see the Tsar wave from his hotel balcony, but it soon became obvious that relations between Alexander and their Prince Regent were far from warm. Alexander was rude to the Prince's ministers, courted the leaders of the Opposition, loathed English food and was said to 'grumble at the long dinners of the Regent's'.²⁰ Worst of all for George, Alexander asked continually after his wife Caroline, Princess of Wales. Barred from all official engagements, Caroline made a rebellious appearance at Covent Garden Theatre on 11 June, and was applauded, in the presence of the Prince's guests. Public opinion, already turned against the Prince Regent, grew even more hostile, and George and his mother were both hissed when they ventured out in their carriages. The contrast between the public reception of the visitors – especially Alexander and Blücher – and that of the ruling sovereign was marked. Soon, George was said to be looking 'fagged and fatigued' and 'tired of the whole thing'.²¹

However, George continued to show his sense of the occasion, which was – after all – what he did best. The Prince had the foremost of his illustrious visitors painted by Thomas Lawrence (1769-1830), and on 9 June conferred the Order of the Garter on both Tsar Alexander and King Frederick. On 12 June the Allied Sovereigns paraded around Hyde Park. Frances, Lady Shelley, described how 'the number of people in Hyde Park even exceeded the countless multitudes which have filled the streets during the past week; to say nothing of the crowds of horsemen and carriages'. In the evening, at a dress party at Lady Salisbury's, the Prince Regent appeared 'covered with orders, as were the others'.²² On 13 June, the visitors and the Prince Regent went to Woolwich, embarking in seventeen barges from the Whitehall stairs. Lady Shelley writes of how 'the royal barge was gorgeously gilded. Its awning was of purple silk, embroidered in gold, while the flag displayed the arms of England'.²³ At Woolwich, the visitors went to the model-room and then to the rocket ground, 'where several experiments were prepared to show the strength and effect of Colonel Congreve's rockets'. There, a 'superb tent was erected on the mound for the illustrious visitors and their suite'.²⁴ On the following day, the Allied Sovereigns and their

entourage began the journey to Oxford, where there was a sumptuous dinner in the Radcliffe Camera and the granting of honorary degrees to the Tsar, King Frederick, Prince Metternich, Count Lieven, the Russian Ambassador and Marshal Blücher.

Back in London, there were further celebrations. On 16 June, a ball was staged at Hertford House in Manchester Square, and on 18 June the Lord Mayor held a banquet at the Guildhall, in honour of the Allied Sovereigns. This, an enormously grand occasion, has been captured in artwork of the period, including a painting by Luke Clennell (now in the Guildhall Art Gallery) and a broadsheet depicting the processions and its principal participants.²⁵

Finally, after a grand review in Hyde Park and a naval review at Portsmouth, the majority of the distinguished visitors departed on 27 June. Alexander issued a proclamation praising 'England, which for twenty years has shaken the colossus of crimes that threatens the universe'.²⁶ Many, it seems, were not sad to see them go. Charles Greville, Clerk of the Council, made the following entry in his diary on 4 July:

The phrensy of curiosity which pervaded all ranks to see these Great People, and the excess of impatience for their arrival, was succeeded by a satisfaction as great, tho' more placid, at their departure. People's curiosity once gratified they soon great tired and bored with the subject of the Emperor and King whose movements had been almost the sole theme of conversation for many weeks.²⁷

Lady Shelley expressed a similar sentiment, writing that 'long before the departure of the Sovereigns public curiosity had been completely satisfied, and their stay became, at last, a positive nuisance. When the date for their return home was fixed, the joy felt by the higher ranks of society was universal'.²⁸ The wider populace too seem to have been glad to return to normal life. During the visit, there was said to be 'no milk sometimes, as the cows are all frightened out of the Green Park by the constant huzzas, and many people cannot get their clothes washed, as the washerwomen work for princes and kings'.²⁹

Nevertheless, celebrations were far from over, for on 23 June the newly created Duke of Wellington had arrived at Dover. This was the event the British public had all been waiting for. Wellington had been in Spain and France for around six years and, stepping onto his homeland, was immediately mobbed. His carriage was cheered all the way to London, through Kent and Surrey, and on arrival at England's capital city the hero was forced to secretly mount a horse and trot through St James's Park to his home off Piccadilly.

Wellington was only in England for five weeks, before returning to Paris as Ambassador, but made the most of his stay. On 28 June he took his seat in the House of Lords as viscount, earl, marquess and duke, soon after attended a magnificent ball at White's Club, and on 1 July a *bal masqué* was held in his honour at Burlington House. There were 2,000 people present, including Lord Byron (dressed as a monk) and Lady Caroline Lamb. Balloon ascents were made outside of the building, and

spectators' tickets were available at half a guinea each. On 7 July, a thanksgiving ceremony was held in St Paul's Cathedral. Wellington rode in the Prince Regent's carriage, bearing the sword of state. The carriage formed part of an immense procession, and took over an hour to travel along the streets which ran, lined with troops, from Carlton House to St Paul's. Wellington sat on George's right-hand throughout the thanksgiving service.³⁰ Two days later, the Duke was entertained with a grand dinner at the Guildhall. Guests present included several of the foreign princes and ambassadors remaining in England, as well as 'a long list of naval and military characters of distinction'.³¹ One toast proclaimed Wellington as 'our immortal Hero, the pride and glory of Britain'.³²

Shortly afterwards, Wellington and the Prince Regent – now good friends – were guests of honour at Wanstead, the home of Wellington's nephew, William Pole-Tylney-Long-Wellesley. Lady Shelley described the occasion as: 'the most magnificent banquet that I ever saw. The royal table – laid for thirty people – was raised on a platform at the end of the room. Above it stood a Buffet, laden with gold plate, and surmounted by a bust of the Prince Regent. At the other end of the room stood a table laden with silver plate, surmounted by a bust of the Duke of Wellington. Down the centre of the room stood two tables for the remainder of the company'. Wellington, surprisingly modest, 'seemed to regard all the pageantry, and the honours of that day as nonsense, and fun. It seemed as though all these honours concerned any one rather than himself'.³³ Nonetheless, later in the month, when the London crowds made way for Wellington and Lady Shelley, he was able to remark: 'It's a fine thing to be a great man, is it not?'.³⁴ On 21 July, the Prince staged a spectacular fête at Carlton House for Wellington – an occasion we will have reason to consider in greater detail (see pp. 35-42). He left London soon afterwards, in order to attend the marriage of his niece to Henry, Marquess of Worcester, on 25 July, and finally set off for Paris on 7 August.

On 1 August, the long-awaited Grand National Jubilee was held in London. The preparations had been rushed, and previously announced dates had proved unworkable. In the end, the date was chosen as it marked the centenary of the accession of the House of Hanover to the throne and the anniversary of the Victory of the Nile. The principal reason for celebration was, of course, peace, but it was generally felt that 'peace was now become a circumstance with which the public mind was familiarized'.³⁵ The British public – who had observed countless fêtes and banquets over the past few months, none aimed at themselves – could finally partake of the national jubilation. The formal notification stated that 'the object of the peaceful festival, is to give to all ranks and orders, a grateful occasion to indulge in that full participation of happiness to which their perseverance, in a most sanguine and trying contest, crowned with unprecedented success, has so richly entitled them'.³⁶ George Tierney was a little more cynical: 'because it was intended to give an entertainment to the Allied Sovereigns, who had left town, it was [now] considered necessary to give a treat to somebody else'.³⁷

The Jubilee was held in St James's Park, Hyde Park and Green Park. The latter was reserved for the fireworks, but in the other parks there sprouted oriental temples, pagodas, bridges, towers, tents and drinking booths. John Nash (1752-1835), the

architect most favoured by the Prince Regent from c. 1808 onwards, was responsible for the overall layout and design of the buildings, but worked closely with Sir William Congreve (1772-1828), Comptroller of the Royal Laboratory at Woolwich, who was in charge of the more technical arrangements and designs. In St James's Park – accessible only by ticket – the principal attraction was a Chinese bridge, which carried a lofty pagoda. Birdcage Walk and part of the Mall were hung with Chinese lanterns, and there was a splendid bridge over Constitution Hill, bearing the names of the chief naval heroes of the war. This bridge connected Buckingham House (then Queen's Palace) with a circular royal booth in Green Park – adorned with the names of Nelson and Wellington – but in the event there were too many people to use it.³⁸ In Hyde Park, the Serpentine river was the focus of a mimic naval battle between British and French fleets.

After a grey start, the weather became brilliant, and the exhibitions began at six o'clock with a balloon ascent from Green Park by Mr Sadler, an eminent aeronaut. At eight o'clock the 'naumachia' began on the Serpentine, 'and by a judicious variety of action, and the grand display of a ship on fire, this spectacle afforded more pleasure than might have been supposed from the ridicule attached to it'.³⁹ The fireworks – which had taken five-hundred men over a month to prepare at Woolwich – began at ten o'clock, and were centred on an edifice resembling a Gothic fortress.⁴⁰ After serving as the focus of a spectacular two-hour display – 'on the grandest and most extensive scale that we have ever witnessed' – the structure metamorphosed into the 'Temple of Concord' (Fig. 1).⁴¹ This was the masterpiece of Congreve, and revolved slowly upon its axis. It was divided into four main compartments, each painted with transparent decoration depicting the origin and effects of war. The subjects were the *Deliverance of Europe from Tyranny*, the *Restoration of the Bourbons by the Aid of the Allies*, the *Return of Peace* and the *Triumph of England under the Regency*.⁴² The latter, which has also been referred to as the *Golden Aera and the Triumph of Britannia*, was painted by Thomas Stothard (1755-1834), and measured around thirty feet in length.⁴³ Stothard's family and admirers were united in lamenting that 'such a work was to be devoted to an evanescent purpose – the exhibition of a night's rejoicing', though it is said to have been preserved and later acquired by the Rotunda Museum, Woolwich, where it was still held in 1851.⁴⁴ The other transparencies were designed by Henry Howard (1769-1847), and were executed by Howard himself along with five other artists: George Dawe (1781-1829), Genta (*fl.* 1814), William Hilton (1786-1839), Robert Smirke (1752-1845; father of the architect Sir Robert Smirke) and Samuel Woodforde (1764-1817).⁴⁵ Unfortunately, when the temple began to revolve, it did so in the wrong direction, so that the paintings were displayed 'the wrong side outward'.⁴⁶ The paintings had to be quickly turned around, greatly dimming the colours.⁴⁷

St James's Park was said to resemble 'Vauxhall on a full night', with tents in rows along the sides of the canal.⁴⁸ The specially built Chinese bridge bore a pagoda, which was painted yellow, ornamented with black lines, and had a bright blue roof (Fig. 2).⁴⁹ The pagoda was also a focus of pyrotechnics, and was said to have appeared 'a blazing edifice of golden fire ... the glass reflectors, in proper places, relieving the dazzling splendour with their silver lustre; the canopies ... throwing up their bright wheels and stars, the pillar enriched with radiance, every rising tower of the pagoda



Fig. 1 A perspective view of the revolving Temple of Concord created in Green Park for the Grand National Jubilee of 1 August 1814. The structure was invented by Sir William Congreve, Comptroller of the Royal Laboratory at Woolwich, with decoration by artists including Thomas Stothard. (© Museum of London)



Fig. 2 The Chinese bridge and pagoda in St James's Park, designed by John Nash for the Grand National Jubilee of 1 August 1814. Towards midnight, the pagoda burst into flames and toppled into the water, creating quite a spectacle. (© The Trustees of the British Museum)

pouring forth its fiery showers and rockets springing from its lofty top in majestic flights, almost presuming to outrival the ancient inhabitants of the firmament'.⁵⁰ However, sometime towards midnight the pagoda suddenly 'exhibited an appearance that excited much doubt'.⁵¹ Doubt soon turned to alarm, as the structure burst into flames and toppled into the water. Though impressive, the spectacle was an accident, and two men were killed.⁵²

This was the only disaster accompanying the whole day's amusements, which the *Annual Register* felt 'will live in the remembrance of those who witnessed its splendours, and will not be unrecorded by future historians of the British metropolis'.⁵³ After the event, the *Gentleman's Magazine* stated that: 'It is an indisputable fact, that so immense a number of the people at large were never brought together, in any previous instance, by any description of public rejoicings, on any of the great events which have so often gilded the pages of British history'.⁵⁴ Despite accusations of 'debauchery, drunkenness and mingled and various abominations', it was clearly a most popular occasion.⁵⁵

Architectural Context

The History of Carlton House

George IV's principal London residence during the years 1783 to 1826 was Carlton House, Pall Mall. The history of the house went back to the seventeenth century, though it dated primarily from 1709 and took its name from its early eighteenth-century owner, Henry Boyle, Baron Carleton. In 1732, the building came into royal ownership, when it was acquired by Frederick (1707-51), Prince of Wales, from Lord Burlington's mother.⁵⁶ The future George IV took possession when he came of age in 1783. Finding there was considerable room for improvement, and voted £60,000 by Parliament, George immediately began a scheme of extensive alterations. The initial repairs were supervised by the architect Sir William Chambers (1723-96), but Henry Holland (1745-1806) had taken over by the end of 1783. Holland, who had recently designed the Neo-Classical Brooks's Club in St James's (1776-78), clearly appealed to George. Through the architect, his own Francophile enthusiasms could be expressed, and in a fashionable, up-to-date manner. Holland was also given responsibility for the furnishing of Carlton House, and worked closely with George's advisors on decoration – Guillaume Gaubert and, after 1787, Dominique Daguerre.

The cost of the building work escalated – expenditure under Chambers, Holland and Gaubert in 1783-86 totalled over £71,000 – but the pace never slackened for long.⁵⁷ The extensive additions made by Holland in these years included a symmetrical front facing Pall Mall behind a screen of Ionic columns (Fig. 3). This feature was probably indebted to those of the Hôtel Salm and the Hôtel de Condé in Paris, which Holland may have seen on his visit of 1785, and was widely considered innovative for its time. The interior was completely reworked, and a number of exquisite spaces were created, including the Grand Staircase.

The building's effect was widely admired. As early as 1785, Horace Walpole predicted that:

It will be the most perfect in Europe ... There is an August simplicity that astonished me. You cannot call it magnificent; it is the taste and propriety that strike. Every ornament is at a proper distance, and not one too large, but all delicate and new, with more freedom and variety than Greek ornaments ... The portico, vestibule, hall, and staircase will be superb, and to my taste, full of perspectives; the jewel of all is a small music-room, that opens into a green recess and winding walk of the garden. In all the fairy tales you have been, you never was in so pretty a scene.⁵⁸

By the last years of the eighteenth century, Walpole's prediction had proved well-founded; Carlton House had become internationally famous.

Henry Holland withdrew from royal patronage in 1802, though it has been conjectured that his involvement with the works at Carlton House ceased around 1795. Various members of the Wyatt family then became involved, most notably James Wyatt (1746-1813), whose work dates principally from the years 1804 and 1805. It was Wyatt who was responsible for the redecoration of the basement rooms



Fig. 3 The north front of Carlton House, the Prince Regent's palace in Pall Mall, from W. H. Pyne's *The History of the Royal Residences* (1819). This façade, set behind a screen of Ionic columns, was designed by the architect Henry Holland. (© Museum of London)

along the garden front. From 1805 to 1812 Thomas Hopper (1776-1856) took over responsibility for the structural and Walsh Porter (d. 1809) for the decorative changes to Carlton House. Joseph Farington commented in his diary for May 1806 that: 'Although Carlton House as finished by *Holland* was in a complete and *new* state He [the Prince] has ordered the whole to be done again under the direction of Walsh Porter who has destroyed all that Holland has done & is substituting a finishing in a most expensive & motley taste'.⁵⁹ Two years later it was stated in the *Microcosm of London* that 'almost the whole of Carlton House is undergoing alterations and improvements'.⁶⁰ The most famous of the additions of this period is the Gothic Conservatory by Thomas Hopper, added to the west end of the basement floor c. 1807-9. This, constructed of cast-iron with plaster decoration, was clearly inspired by the Chapel of Henry VII, Westminster Abbey, and boasted an impressive set of armorial glass, later removed to Windsor (see Fig. 8).

After the sudden death in 1813 of James Wyatt, who had continued to be involved in Carlton House, there was a radical reorganisation of the Office of Works. Three independent architects were to be 'attached' to the office, and would design buildings and supervise execution under the overall control of the Surveyor-General. John Nash became responsible for all the royal palaces which served as personal residences of the Prince, whilst other duties were delegated to Sir John Soane and Sir Robert Smirke. Consequently, by the end of 1813, Nash had begun the completion of the work of his predecessor.⁶¹ In 1814 Nash's Gothic Dining Room was added to the east end of the garden front, balancing Hopper's Conservatory. This, despite talk of further schemes and even of complete rebuilding, was to be the last major addition to Carlton House.

In spite of the continual, and increasingly extravagant, reworkings, the Prince Regent was not satisfied with his London residence. In March 1816 Nash reported that Carlton House was 'so destitute of the necessary and usual accommodation for Servants, both in respect of Offices, Bed rooms, and other conveniences, and the unfinished state of the East end of the Palace requiring consideration, it is the Prince Regent's pleasure, that nothing but the common repairs incident to the occupation of the building be done at present'.⁶² The plan had always been awkward and, due to the house's proximity to a major thoroughfare, privacy was somewhat lacking (Fig. 4).

On the death of his mother in November 1818, George turned his attention more seriously away from Carlton House, and began to think about rebuilding the Queen's Palace (Buckingham House). However, funds for such a lavish scheme had to be raised, and in 1822 George, King of England since 1820, was still based at the rapidly deteriorating Carlton House. In an account of 1822, Nash described how the house had 'the same unfinished appearance towards Pall Mall – the same dilapidated buildings at the East end of the entrance front and the side court exposed as it now is to the Entrance Court – there will be but one Entrance common to Noblemen's Carriages and waggons and carts – the necessary accommodation for servants of which Carlton Palace is so woefully deficient and which are now more than ever required will still be wanting'.⁶³

Carlton House Described

The external appearance of Carlton House was recorded in a number of contemporary views. The entrance front of the building (completed c. 1794) was divided from Pall Mall by a screen of coupled Ionic columns set on a continuous podium. The screen bore sculptural decoration supplied in artificial stone by Eleanor Coade, and had pedimented gateways at either end. Behind the screen – which served to keep public view to a minimum – rose the two-storeyed rusticated façade of Carlton House, designed by Henry Holland (see Fig. 3). This front was dominated by a full-height Corinthian hexastyle portico, described in 1825 by W. H. Leeds as ‘both in its plan and elevation ... the finest example of its kind in the Kingdom’, and more recently as ‘perhaps the most sumptuous ever executed in London’.⁶⁸ The portico was set centrally, and flanked by two shallow projecting wings. The portico was made excessively deep, in order to allow space for carriages to pass underneath, therefore serving as a *porte-cochère*. In this, Holland’s design was innovative, and is said to have inspired the design of a number of later buildings.⁶⁹

The only notable feature of the garden front, which was left much as Holland found it in the late 1780s, was a canted bay. Owing to the nature of the site – a steep slope from Pall Mall towards St James’s Park – this front had three storeys, the principal apartments appearing to be at first-floor level (Fig. 5).



Fig. 5 The south front of Carlton House, towards the gardens, from W. H. Pyne’s *The History of the Royal Residences* (1819). (© Museum of London)

The internal design and layout of Carlton House has attracted much debate, and is by no means clear-cut. There is a shortage of plans and contemporary views; the twenty-four watercolours of the palace, published in W. H. Pyne's *The History of the Royal Residences* (1819), form the core of evidence about the building's interior. However, despite their fine execution and detail, these are limited in use, as they capture the building in its last phase of development, after so many of the Holland interiors had been swept away.

As has been shown, Carlton House was almost continually rebuilt and altered until at least 1814. Rooms were frequently renamed to reflect their changing decoration and the Prince's evolving tastes and needs. Times of particular activity were 1794, before George's marriage to Princess Caroline; the years 1806/7, after their separation; and 1810/11, when the Regency Bill was passed.⁷⁰ The pace and scale of the changes in decoration was remarkable; in 1810 Lady Sarah Spencer commented that: 'He [George] changes the furniture so very often, that one can scarcely find time to catch a glimpse of each transient arrangement before it is all turned off for some other'.⁷¹ There are instances of chimneypieces being moved from one room to another, and of rooms being started but not finished. Late in 1806, Matthew Cotes Wyatt painted ten allegorical panels for the ceiling of the New Drawing Room, at a cost of £168. Around five months later, the panels were 'taken down to have Gilt designs introduced instead'.⁷²

In these decisions the Prince was the principal driving force. No consideration was given to expense, and the wastage must have been prodigious. This lack of stability was reflected in the building's style. Classical, Gothic and Chinese were all represented to varying degrees, coming and going with the Prince's current enthusiasms. In this way, Carlton House functioned as a 'testing ground' for the Prince's tastes, which found their fuller expression in other royal seats such as the Brighton Pavilion (see Figs 68-69) and, later, Buckingham Palace and Windsor Castle.⁷³ However, Classicism – whether authentic Roman or French Neo-Classicism – remained the principal trend at Carlton House.

Despite the constant flux of the decoration and use of the apartments on all levels, a basic description of Carlton House can be given. The visitor, entering from the main (Pall Mall) side, would have found himself in the Hall, the first in a suite of spectacular reception rooms (Figs 6 and 7). The Hall, of all the rooms in Carlton House, was that least affected by the later alterations carried out for the Prince, and thus was captured by Pyne in its original Holland-designed form. Each of the four walls had an arched opening, with screens formed by two Ionic columns and two Ionic pilasters. The columns were of yellow brocatello marble with bronzed capitals and bases. The ceiling was coved and coffered, and topped by a skylight.

The Hall opened dramatically to the south onto the Octagon Vestibule or Tribune, 'which provided the pivot on which the whole complex plan revolved'.⁷⁴ This room rose through two storeys, the upper level forming a first-floor Gallery, as well as serving as the landing to the adjacent staircase. A lantern illuminated both Vestibule and Gallery, the latter having a ceiling set off with late Gothic-style fan-vaulting.

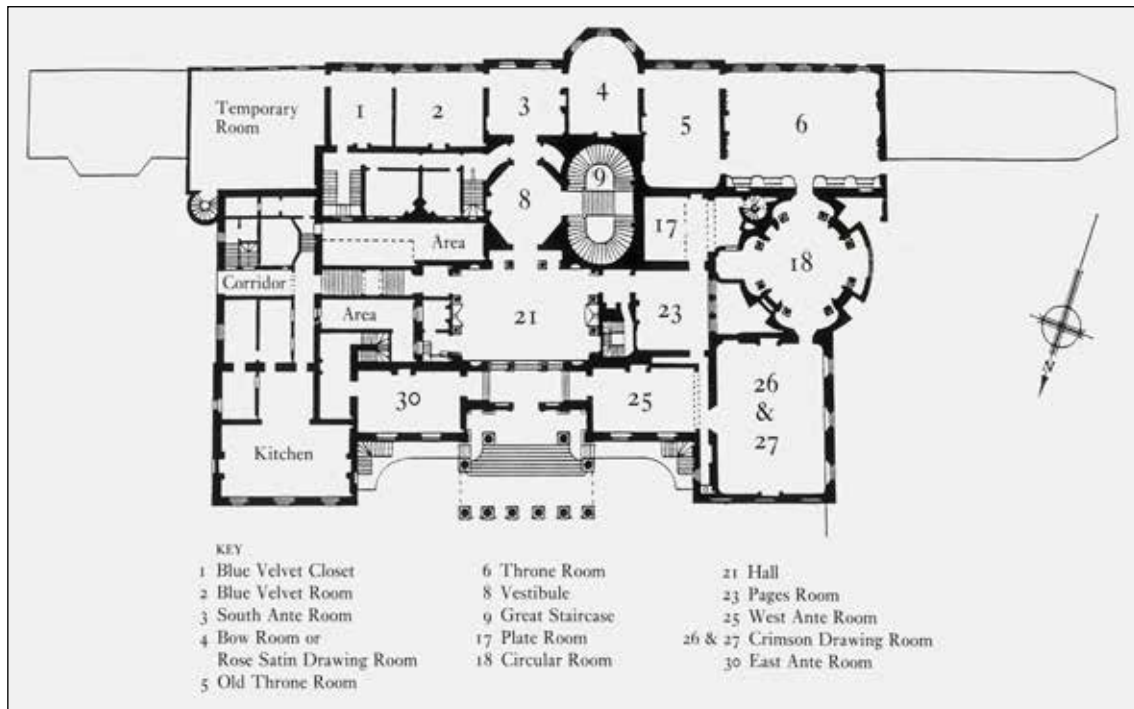


Fig. 6 Plan of the ground floor of Carlton House in c. 1819, from the 1991 exhibition catalogue *Carlton House: The Past Glories of George IV's Palace*. (Royal Collection Trust/ © Her Majesty Queen Elizabeth II 2020)

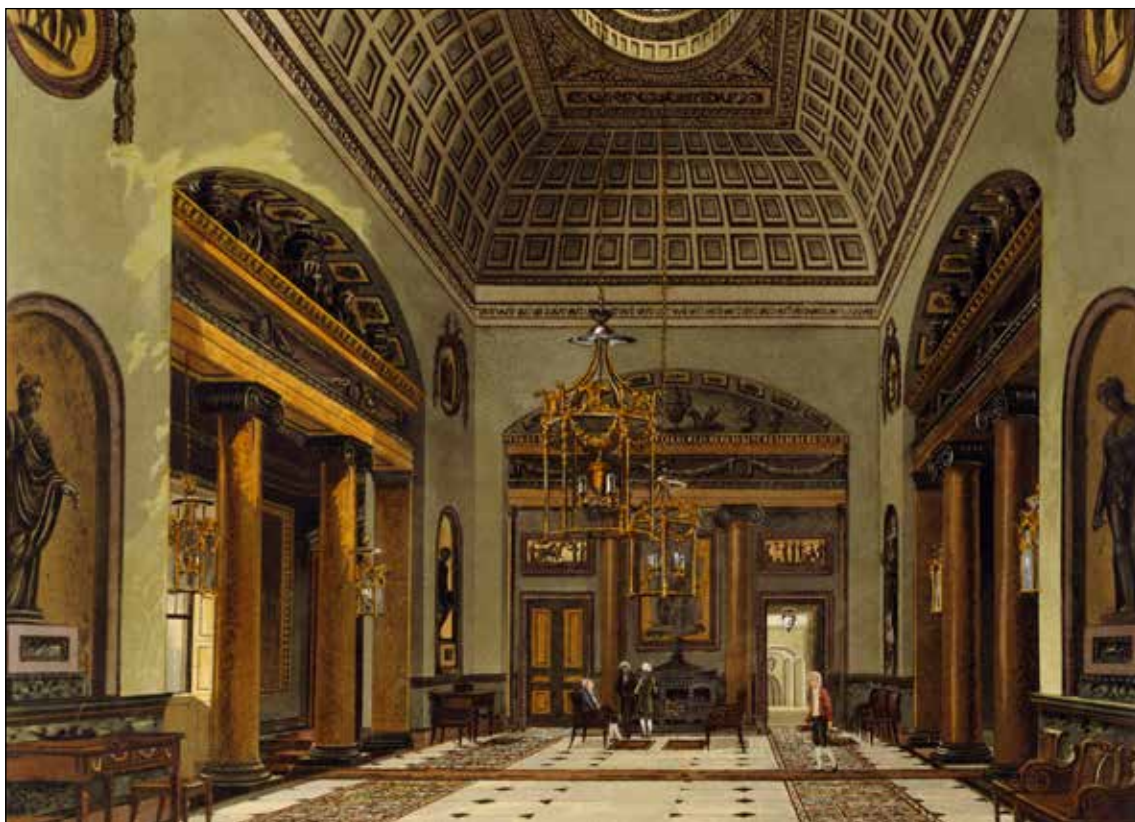


Fig. 7 The entrance hall at Carlton House in a view from W. H. Pyne's *The History of the Royal Residences* (1819). (© Museum of London)

The Grand Staircase, to the west of the Vestibule, was one of the most admired features of Carlton House. After a short single flight, it divided to sweep on either side to the next floor, and bore an elaborate balustrade of wrought iron and brass. In form, it owed a great deal to William Kent's staircase at 44 Berkeley Square (1742-44), as well as to Chambers's staircases at Somerset House (1776-96). The oval staircase space was top-lit, the glazed dome being decorated with painted glass.

The main suite of rooms – running along the garden front – was accessed from the south of the Vestibule. As originally designed by Holland, the easternmost of these rooms formed the State Bedchamber. After 1794, this and the neighbouring rooms were adapted to house Princess Caroline, and the Prince's bedchamber was transferred to the attic floor. Around 1807, the rooms were re-converted for the use of the Prince and, by Pyne's day, formed his private audience rooms. Most impressive was the so-called Blue Velvet Room, the audience room used for ambassadors and ministers of state. At the west end of the garden front, on the other side of the bow-fronted Rose Satin Room, were the Old Throne Room and the Throne Room. The latter, originally a drawing room, was created when George became Regent in 1811, and the former became an ante-room. The Throne Room was much larger than its predecessor, and – as one might expect – was one of the most impressive rooms in Carlton House. It had a unified scheme of decoration; the ceiling and walls were all treated with elaborate gilding, and many of the furnishings were of crimson velvet. To the north was the Circular Room, built partly on the site of an old courtyard and forming the centre of the west enfilade. Holland arranged around the walls eight red porphyry columns, with silver and bronze Ionic capitals. The ceiling was painted to resemble sky. The Circular Room would have served as the reception hall for formal levées, and would have been entered, not via the Throne Room, but from the Hall via the West Ante-Room and Crimson Drawing Room.

The grand enfilade of rooms at basement level, opening onto the garden, were also used for the reception of guests. They would have been entered from the Grand Staircase via the Lower Vestibule or Ante-Room, reworked in 1813 by Nash. Although the ceilings of these rooms were rather low, the effect must have been magnificent; when the suite was complete, with the Gothic Conservatory added c. 1807-9 and the Gothic Dining Room added in 1814, a series of double doors gave an uninterrupted view from west to east. From the west end, the rooms consisted of Thomas Hopper's Conservatory, which had a fan-vault largely of glass (Fig. 8), the Dining Room, the Ante Dining Room (originally the Chinese Room), the Bow Room, the Gothic Library, the Golden Drawing Room or Corinthian Room and the Gothic Dining Room. The Golden Drawing Room, an 'amazing Nash extravaganza' surrounded by fluted gold columns, was particularly admired, more so than the architect's adjacent Gothic essay, 'an altogether less successful affair'.⁷⁵

The attic floor of Carlton House was mainly private, though it did contain the Prince's Armoury, which was made accessible to visitors. By 1819 the Armoury occupied five rooms in the east wing of the floor, and contained thousands of pieces, mostly armour, uniforms and arms. W. H. Pyne mentions such items as shields, arrows, battle-axes, halberts, staves, boots and spurs, two models of horses 'the size of life', coats of mail, Japanese spears, sabres, pistols, pikes, cuirasses, helmets

and the dagger of Genghis Khan.⁷⁶ In 1808 a writer in Rudolph Ackermann's *Microcosm of London* stated that 'so extensive and multifarious are the objects of this museum, that to be justly appreciated it must be seen. His Royal Highness bestows considerable attention upon it, and it has in consequence, arrived in a few years to a pitch of unrivalled perfection'.⁷⁷



Fig. 8 The Gothic-style conservatory at Carlton House, designed by architect Thomas Hopper, from W. H. Pyne's *The History of the Royal Residences* (1819). (© Museum of London)

Needless to say, all of the apartments of Carlton House were fitted out with the richest furnishings, chosen and – in at least one case – designed by the Prince himself.⁷⁸ Rooms were steeped in richly coloured fabrics, in silks, velvets and gold thread. By the time W. H. Pyne published his *Royal Residences* in 1819, the colours had been reduced to two: blue and crimson. The constant alteration of decorative work does not necessarily imply lack of real thought or preparation. On the contrary, it is known that models were made – of rooms, ornaments and even furniture – and that specimens and patterns were submitted.⁷⁹ Clearly, George was continually striving to find the most appropriate decorative scheme for each particular room and, as his palace became the heart of Britain's court life, was increasingly anxious to impress. Throughout Carlton House, the Prince's vast collections of china, plate, furniture (predominantly French), sculpture and artwork (especially portraiture) were integrated carefully with the interior design, producing an overall effect that rivalled the greatest royal residences in contemporary Europe.

Fêtes and Temporary Rooms at Carlton House

With the degeneration in health of George III, Carlton House increasingly became the centre of court life in England. Ceremonies such as levées and audiences were held there, and it was at Carlton House that George received crowned heads and important dignitaries. With George's investiture as Regent in early 1812, Carlton House made its final transformation from private house to public palace.

Always aware of spectacle, the Prince intended visitors to be overwhelmed by the grandeur of his London home and of the country of which he was titular head, and staged a number of magnificent fêtes at Carlton House, especially over the years 1811-14. Fêtes were held, for example, on 6 February 1811 to mark the installation of the Regent; on 19 June 1811, in honour of the King's birthday (the so-called 'Jubilee Fête'); on 5 February 1813, in celebration of the Peninsular victories; and on 6 July 1813, in celebration of the Battle of Vitoria. June of 1814 was given over to banquets and receptions to mark the visit of the Allied Sovereigns. These entertainments were incredibly lavish. In February 1813, Lady Elizabeth Fielding described a fête held in 'that Mahomet's Paradise, Carlton House. I do not know whether *we* all looked like *Houris*, but I for one was certainly in the seventy-seventh heaven ... The sight and sound were both animating, the kettledrums and cymbals, the glitter of spangles and finery, of dress and furniture that burst upon you were quite *ebouissant*'.⁸⁰ Such events were almost always expensive. The total expenditure for the fête of June 1811, for example, was £2,585 11s. 4¼d., and that for February 1813 was £749 9s. 7¼d.⁸¹ In August 1812 it was estimated that over a period of five years more than £20,000 had been spent on fêtes.⁸²

As part of the preparation for these occasions, tents and temporary buildings were invariably erected in the gardens (see Fig. 4). The reason for this was part show and part necessity – one of the worst disadvantages of Carlton House was its restricted space. Rooms were comparatively small and, at basement level, had low ceilings. In the 1780s and 1790s the Prince's temporary buildings appear to have been relatively modest, at least in terms of cost. The accounts for 1784, for example, mention a marquee costing £192, and in 1792 eight large marquees cost £249.⁸³ That used

in 1784 had an interior ‘festooned, fringed, tasselled and lined with Irish linen’.⁸⁴ In May 1790 a temporary structure costing £130 was described as ‘a very large marquee in the shape of a bell’. This was ‘supported by poles with a very strong circular frame’ and had a ‘tammy roof’.⁸⁵

However, after becoming Regent, George increasingly turned the disadvantages of Carlton House to his favour by paying uncommon attention to the design and decoration of temporary buildings. In 1811, on the occasion of the Jubilee Fête, £690 7s. 10d. was paid to James Baber’s Patent Floor Cloth Manufactory for the hire of temporary rooms, the highest amount paid to any of the workmen.⁸⁶ In 1813 temporary structures included a pagoda and a ‘Bell tent’ lined with green calico.⁸⁷ In July of that year, ‘a large Round Tent with Chits inside linings Complete’, together with two small round tents and some artificial flowers, were lent by Carlton House to Vauxhall Pleasure Gardens, where they were used for a fête in honour of the Victory of Vitoria.⁸⁸ This implies that the Prince’s stock of temporary buildings and related paraphernalia had become rather considerable.

It is hard – because of their temporary nature – to envision these structures, but some significant architectural pretension must have been present, at least from 1811 onwards. This likelihood is increased when one considers that the Prince’s fêtes, as public occasions, were directed by the Office of Works, and thus became the responsibility first of the Surveyor-General James Wyatt and, after his death in 1813, of John Nash.⁸⁹

In addition to the tents erected in the gardens of Carlton House, temporary additions and changes were made to the palace itself. In early 1813, presumably in preparation for the fête of February of that year, an elaborate temporary scheme of decoration was devised for the Gothic Conservatory. All of the room’s Gothic candelabra were removed, the Gothic screen was painted in colours and about a hundred additional lamps were installed. For the Wellington Fête of 1814, which shall be discussed in detail, a temporary room was built over the basement-level Corinthian Room, and a staircase was added leading from the Small Blue Velvet Room. Also, a ‘Temporary Gothic Room’ formed an extension to Hopper’s Conservatory.⁹⁰

The Jubilee Fête of 1811, originally planned for 5 June but put off until the 19 June, provides a good example of the level of magnificence achieved by the Prince. The preparations were supervised by James Wyatt, who was paid £1,500 out of the Prince’s Privy Purse for his work. To supplement Carlton House’s main accommodation, four large marquees were ‘pitched on the lawn ... with a *chevaux de frize* to prevent all intrusion’.⁹¹ The temporary structures were described by Miss Berry in her *Journal* as ‘immense, and admirably contrived’.⁹² The focus was a ballroom, which had a ‘floor painted with ornaments’ and, around its edge, ‘a border à la Romana all in white’. In the centre of the room was a ‘large circle in colour with initial of HM in gold’.⁹³ It is probably this same tent that was described by Sir George Jackson as being supported by gilded ropes, which ‘were ornamented with wreaths, and festoons of flowers without end. The lustres were large, and very handsome, and of the finest glass, and were so numerous that every part of the tent was not only well

but brilliantly lighted'.⁹⁴ The private rooms apparently 'formed on this occasion ante-rooms to the tent'.⁹⁵

The guests, around 2,000 in number, represented men and women from the highest ranks of society, and were asked to 'come dressed in articles of British manufacture only'.⁹⁶ All were admitted by ticket from around nine o'clock – the string of carriages apparently reached to the top of Bond Street – and were led through to the basement level and gardens beyond. Two hundred of the most honoured guests – including the French royal family, British ministers of state, and ambassadors – were seated in the recently completed Gothic Conservatory, at a table said to be over 200 feet in length. At its head sat the Prince Regent, dressed in a field marshal's uniform designed by himself. This was adorned with rich gold embroidery, and was rumoured to weigh around 200 lb. A stream ran along the length of the table, and in it were placed real fish, 'the dying and the dead'.⁹⁷ The effect was apparently 'really like what one would imagine a fairy hall to be'.⁹⁸ The supper itself included hot soups, roasts, tropical fruits such as peaches, grapes and pineapples, and iced champagne for everybody.

Poet Tom Moore – one of the guests – wrote that 'nothing was ever half so magnificent ... it was *in reality* all that they try to imitate in the gorgeous scenery of the theatre'. The fête was an 'assemblage of beauty, splendour, and profuse magnificence ... women out-blazing each other in the richness of their dress'.⁹⁹ Sir George Jackson was similarly impressed, writing that the fête 'as a whole was the handsomest thing I have ever seen in this country, or, of its kind, in any other'.¹⁰⁰ However, Jackson also drew attention to its disadvantages: 'the grand entrance hall ... was constantly full. There was a ball-room, but little or no dancing, so that until half-past two the *fête* consisted of an assemblage of grandly dressed persons promenading from one room to another; and you will allow that those who arrived at nine had enough of it. The ball room was hot in the extreme, and wherever the Prince and his party ... were, was crowded to excess for the time'.¹⁰¹ He further added that that the 'serpentine river' on the supper table was 'a paltry thing of bad taste' and that the Prince's uniform was 'of not very good taste or very well made'.¹⁰² The fête, as is to be expected, became notorious with those who had not been present. Its cost was estimated (over-estimated, in reality) by Shelley to be £150,000, who grumbled 'nor will it be the last bauble which the nation must buy to amuse this overgrown bantling of Regency'.¹⁰³

On the three days following the Jubilee Fête – 24-26 June 1811 – Carlton House was opened to the public. The event attracted massive crowds and was, on the whole, rather a disaster. Pall Mall was choked, and people (especially women) rushed into the palace, creating a stampede. On the final day, 30,000 stormed the Prince's palace. One lady had her leg broken, and others were carried away apparently dead. Those 'fortunate enough to escape personal injury, suffered in their dress; and few of them could leave Carlton House, until they had obtained fresh garments'.¹⁰⁴ Joseph Farington recounts that: 'Before I got into the House more than an Hour & Half had passed'.¹⁰⁵ The Duke of Clarence (the future William IV) attempted to hold back the mob with a speech from 'the top of the wall which fronts the house', but the crowds were still clamouring for admission several days later.¹⁰⁶

Tents and Tent-Rooms

It will be seen from the above that lavish temporary buildings featured regularly at Carlton House and, indeed, would have been familiar to the masses. Temporary buildings were regularly erected when extra space was needed, or when an event called for a specially designed structure.¹⁰⁷ They were often incredibly lavish, and had particular connections with revelry, festivity and royalty. In May 1527 Henry VIII (r. 1509-47) erected a temporary banqueting house in the tiltyard at Greenwich, for the entertainment of a French embassy sent to negotiate a royal marriage. This building was described by Holinshed, and featured work by Hans Holbein, the sculptor Giovanni da Maiano and the Italian painters Vincent Volpe and Ellys Carmyan.¹⁰⁸ Elizabeth I (r. 1558-1603) erected a similar edifice in 1581-82 at Whitehall, for the reception of the French commissioners. This was a canvas structure, on the site of the present Banqueting House by Inigo Jones, and was strong enough to last twenty-five years.¹⁰⁹

As a building type, the tent is – of course – incredibly ancient, and was used widely in countries as far apart as Turkey and China. In Britain, tents became especially associated with the military encounters and triumphs of the Middle Ages. Splendid pavilions were, for example, erected by Edward III (r. 1327-77) and his successor, Richard II (r. 1377-99). These were often circular and bell-shaped, were richly coloured, and many had garret windows in their roofs for ventilation.¹¹⁰ In France, too, tents were elaborate. In 1393, at a meeting of ambassadors hoping to make peace among Christian powers, the Duke of Burgundy had a tent ‘made of planks of wood, and covered by painted canvas: its form was that of a castle flanked by towers’.¹¹¹ In 1476, another Duke of Burgundy erected a tent with an exterior of coloured canvas, and an interior ‘lined throughout with a rich red velvet cloth, and curtains of red silk; the whole embroidered with leaves of gold, interspersed with clusters of magnificent pearls ... Even the numerous ropes by which the tent was stretched were also interlaced with golden cords’.¹¹² In the sixteenth century, tents remained popular. Henry VIII apparently had ‘superb tents’, including those he used for his 1520 meeting with Francis I at the Field of Cloth of Gold near Calais and his 1544 siege of Boulogne.¹¹³

In the later years of the eighteenth century, especially during the Napoleonic Wars, the tent was revived as a stylistic form, and became a model for more permanent buildings. This was partly due to the new-found interest in chinoiserie and eastern styles of architecture, and to the practical need for garden pavilions, but also fitted the increasingly military climate of Europe. In 1782 an elaborate, painted copper *corps de garde* (guard’s tent) was built at King Gustav III’s summer palace of Drottningholm in Sweden (Fig. 9). This was designed by C. F. Adelcrantz (d. 1796), who worked closely with Fredrik Magnus Piper (1746-1824), Sweden’s most famous landscape architect. The building, designed in the form of a Turkish campsite tent, was intended as a lodgment for Gustav’s Dragoons. Similar structures were designed by Piper for Haga Park, near Stockholm. Three of these, known as ‘copper tents’ or guard houses, were eventually erected in 1787-90 to the designs of Piper’s successor, the French architect Jean Louis Desprez (d. 1804).¹¹⁴ One, painted with tassels and folds, now forms the entrance to Haga Public Park.



Fig. 9 The Guard's Tent in the gardens of Drottningholm Palace, Sweden, designed by C. F. Adelcrantz in 1781 and built the following year, with walls of painted sheet metal. King Gustav III is said to have come up with the idea for the building after visiting France, where he saw tents given to Louis XV by the Turkish Sultan. (© Alden Gregory)

The inspiration for such structures may well have come, in part, from Britain. Piper trained in England before returning to Sweden in 1780, and certainly visited and sketched Stourhead in 1779. At that time, the park included a 'Turkish Tent', which apparently stayed up all year round. This was removed in the 1790s by Sir Richard Colt Hoare.¹¹⁵ Other 'tents', seemingly of a temporary nature and most often 'Turkish', were recorded at Painshill, Surrey (also sketched by Piper), and at Vauxhall Pleasure Gardens in London.¹¹⁶ As early as 1765, the *Gentleman's Magazine* could describe Vauxhall as having:

a Turkish tent, the dome of which is finely carved, and supported by eight columns of the Ionic order; the outward case stands on twelve columns of the Doric; Between these, both within and without, hang very rich festoons of flowers. The outside of the dome is variously embellished, and surmounted by a plume of feathers. From the center within hangs a large glass chandelier, and four smaller ones at each corner.¹¹⁷

In France, the tent appears to have been a popular device from the 1770s. Francois-Joseph Belanger (1744-1818) included a 'Great Chinese Tent' in his plans for the gardens of Bagatelle, Paris, together with a tent-roofed 'Philosopher's Hut' in the Gothic style.¹¹⁸ The French were also quick to adopt the tent as an interior feature – a 'tent-room' was installed at Bagatelle to designs by Belanger. Such rooms were entirely hung with fabric, most commonly striped, the whole of the ceiling taking the form of a canopy. Napoleon clearly favoured the military and exotic character of such spaces. At Malmaison, near Paris – the home of Napoleon and Josephine from c. 1799 until their divorce in 1809 – the architects Charles Percier (1764-1838) and Pierre Fontaine (1762-1853) included a Council Room in the form of a tent. The walls and canopied ceiling were covered with fabric striped in yellow, off-white and black, and a black and gold faux-bronze balustrade with lions' heads ran around the lower part of the walls. Also at Malmaison there was a large tent-shaped waiting room for officials, attached to the entrance of the house. This was made in cast-iron and glass, was hung with rich materials on the inside, and was painted on the outside to

give the appearance of striped fabric. Furthermore, Josephine's round bedchamber was designed as a faux-tent, with gilded columns holding up a lushly draped red silk canopy, with a circle of painted sky revealed at its centre.

Malmaison, the foremost example of the French Empire style, was to be much imitated across Europe, and in Britain the tent-room quickly became fashionable. Such spaces were especially favoured by the future George IV, whose interest in militaria and eastern styles of architecture was already well-established. George's bedroom of 1787 at the Marine Pavilion in Brighton was hung with quilted chintz, and has been interpreted as a tent-room.¹¹⁹ At a slightly later date, his bed was indisputably 'fitted up as a tent', and in 1802-4 designs were made for a tent ceiling, most probably for the Prince's boudoir. In the early 1830s, after the extensive transformation of the Pavilion had been completed, George's boudoir still took the form of a tent. It was described as having 'fluted blue silk on the walls and ceiling, entirely decayed/festooned and fringed with the same silk, and white ground blue pattern convolvulus, calico blue silk ropes, tuft fringe – white silk ropes, bell tassels and tufted fringe – the centre compartment having four fasces or standards'.¹²⁰

At Carlton House, Walsh Porter included the now widely popular tent device. In 1806 the easternmost room on the garden front of the building – usually referred to as the Small Blue Velvet Room – became known as the Silk Tent or Military Tent Room, or Blue Striped Tent Room. It appears to have been conceived as a room hung with sarsenet hangings of alternate pale blue and white stripes, but may never have been executed as such. A room at basement level, at the foot of the Grand Staircase, was fitted out as a tent, though it only had a short life, and was dismantled by 1809. This appears to have been octagonal in shape, and was fitted up as two tents, one red striped and the other blue striped. Both tents were presented to Lord Yarmouth in 1811. The tent-room continued to be popular well into the 1820s; an 'Octangular Tent Room' was, for example, illustrated in George Smith's *Cabinet-Maker and Upholsterer's Guide* of 1826.

The Design and Erection of the Rotunda, 1814

With the abdication of Napoleon in April 1814, the Prince Regent's talent for showmanship really came to the fore. George seems to have immediately begun planning a series of grand events at Carlton House, and temporary buildings and decorations were, as usual, necessary. It was intended that these structures and additions would be ready for the visit of the Allied Sovereigns in June, and time was of the essence. John Nash, now the Prince's favourite architect, was given control over design for these grand fêtes, and would have immediately set to work. There was the illumination of Carlton House to prepare for, as well as the Prince's fêtes and the Grand National Jubilee, the latter supervised by John Nash and Sir William Congreve. In addition, the structural work on Carlton House was still underway, and needed to be brought to a close.

Activity at Carlton House, and in the nearby royal parks, must have been feverish. Crowds are said to have gathered to watch the progress of the work for some weeks, and in May 1814 there was a mention of 'the very extensive works now going on at Carlton House'.¹²¹ The building accounts give an interesting picture of the frenzy,

workmen often complaining about the lack of notice given for the completion of their work. On 21 May 1814 Nash apparently commissioned Thomas Allwood, the Prince's carver and gilder, to carve twelve large Corinthian capitals for Carlton House, 'but could only give him 21 Days to do them all in; on which account, rather than disappoint Mr Nash (for it would take three months to do them all) your memorialist [Allwood] undertook to carve two only'.¹²² In the end, several craftsmen were employed, including Peter Ferraco, who in June 1814 'carved in wood at a very short notice and at great inconvenience two Corinthian capitals for some building then going forward at Carlton House'.¹²³

In the parks, a team of workmen laboured from dawn until dusk in an attempt to complete the structures. The efforts of John William Hiort (1772-1861), who Nash employed as Clerk of the Works and Measurer, have been recorded, as his payment of £450 was queried the following year by the Office of Works. Nash, writing in defence of Hiort's charges, stated that 'considering the very short time so large an expenditure was incurred and the very extraordinary exertions he was, on that account, obliged to use having three different buildings in three different places to conduct – that he attended from 5 in the morning till 8 at night and afterwards at his office ... he actually performed the duty of three clerks of the works'.¹²⁴ Shortly afterwards the Surveyor-General, Colonel Benjamin Charles Stephenson (c. 1766-1839), referred to 'those works, which were executed under circumstances of great difficulty, as well as from the peculiar nature of the Buildings themselves as from the shortness of the time in which they were ordered to be completed'.¹²⁵

The bills of the workmen involved in the preparations for the Grand National Jubilee reflect the level of labour involved. For example, George Hutchinson, painter, charged £2,007 6s. 6¾d., John Nash £1,767 16s. 7d., Parker & Perry £2,273 2s. 0d. and James Watts the huge sum of £12,427 2s. 5d.¹²⁶ The same team of workmen would, it seems, have been involved in the erection of the temporary buildings at Carlton House. The carpenter Jeffry Wyatt, for example, charged £15,000 for 'works performed by him for the late fêtes fire works & New Rooms in the Parks and at Carlton House'.¹²⁷ From at least June of 1814, but mainly in July, firms such as Tatham, Bailey & Saunders and Parker & Perry were busy on the furnishing, fitting and general readying of Carlton House and the temporary buildings.¹²⁸ The furniture of the state apartments and basement rooms was all dusted and cleaned, men transported large numbers of chairs in 'caravans' to Carlton House, 'temporary sideboards' were built and set up in various of the rooms, and countless 'lustres' were erected (many 'made on purpose').¹²⁹

The principal temporary building erected at Carlton House between May and July 1814 was a vast ballroom in the form of a military bell-tent. At the time, this was known most commonly as the 'polygon building', but the term 'Rotunda' was also used from the outset.¹³⁰ It has been stated that the structure 'was built of brick, with a leaded roof', for the obvious reason that this is how it survives today.¹³¹ However, the discovery of the original designs for the 'polygon', made by the author during the course of research for this report, prove that no 'permanent' materials were originally used (Figs 10-13).¹³² This is not to say that the Rotunda was intended to have only a brief existence. In July 1814, in defence of the high expenditure at the Prince's palace,

the Chancellor of the Exchequer stated that ‘With regard to the rotunda erected in the gardens of Carlton-House, it partook in some degree of the nature of a permanent building as it could be taken down and put up again at pleasure’ – a comment which gave rise to an outburst of laughter in Parliament.¹³³

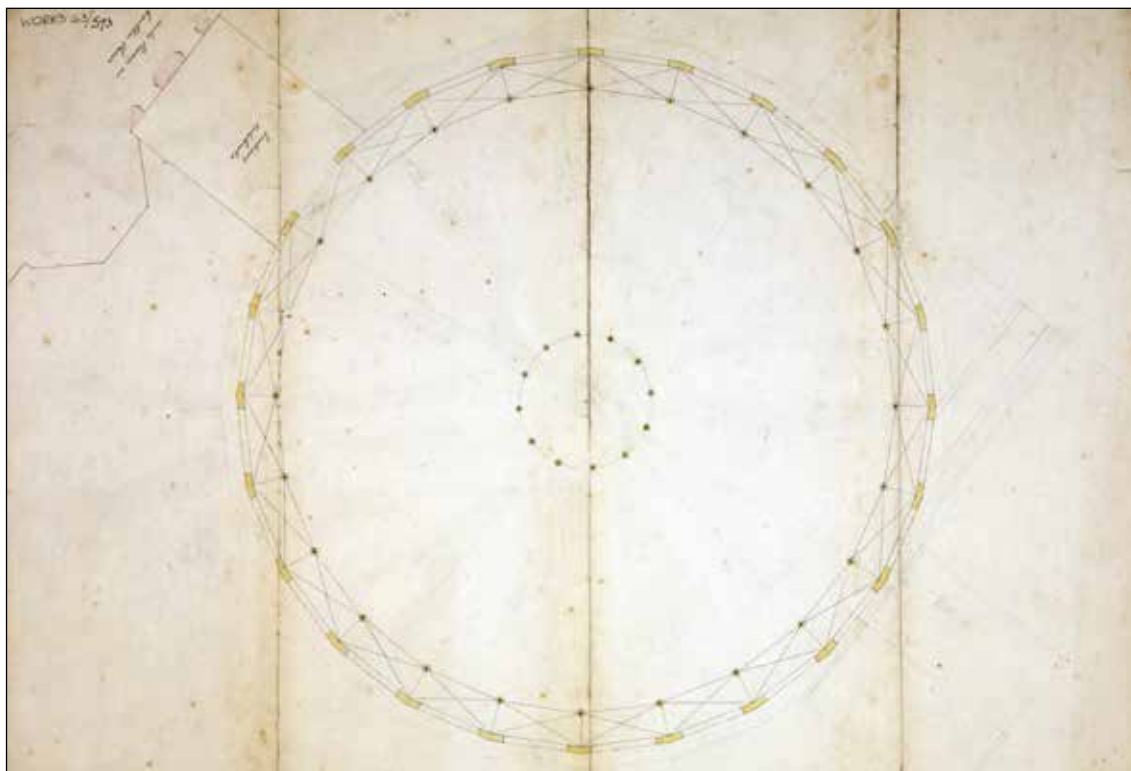


Fig. 10 Ground plan of John Nash's 'tent room', May 1814. The red lines at the top left of the image show the profile of Carlton House, with a 'temporary vestibule' linking the Rotunda to an ante-room in the palace, next to the bay window. (The National Archives, ref. WORK 43/573)

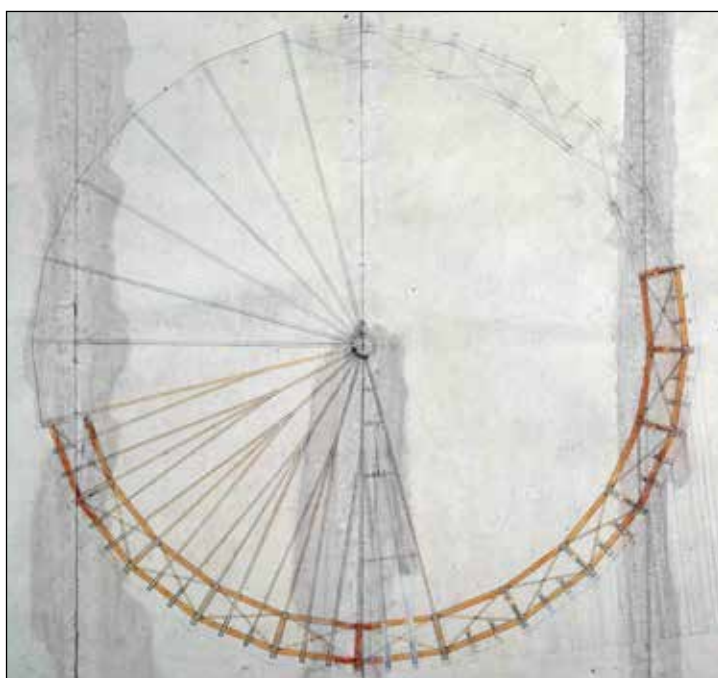


Fig. 11 Roof plan of Nash's 'tent room' (Rotunda) at Carlton House, May 1814. (The National Archives, ref. WORK 43/574; colour-adjusted)

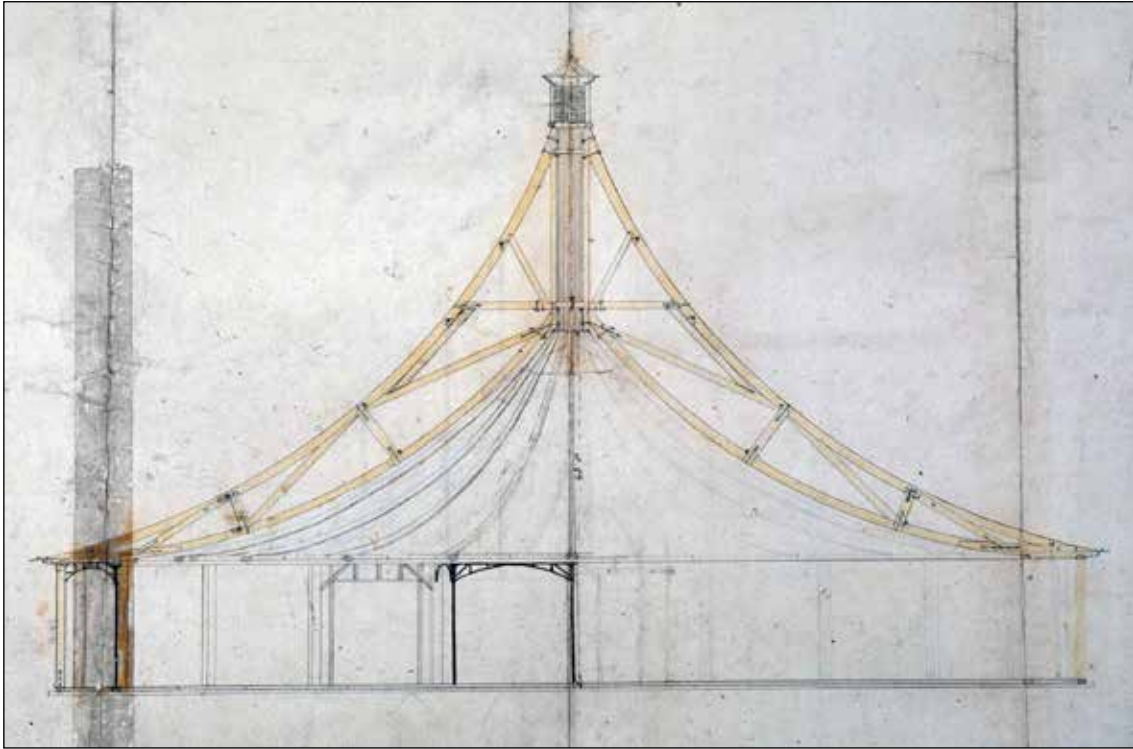


Fig. 12 Section of Nash's 'tent room' (Rotunda) at Carlton House, May 1814. This image shows the roof structure and the suspended canvas ceiling below. (The National Archives, ref. WORK 43/575; colour-adjusted)

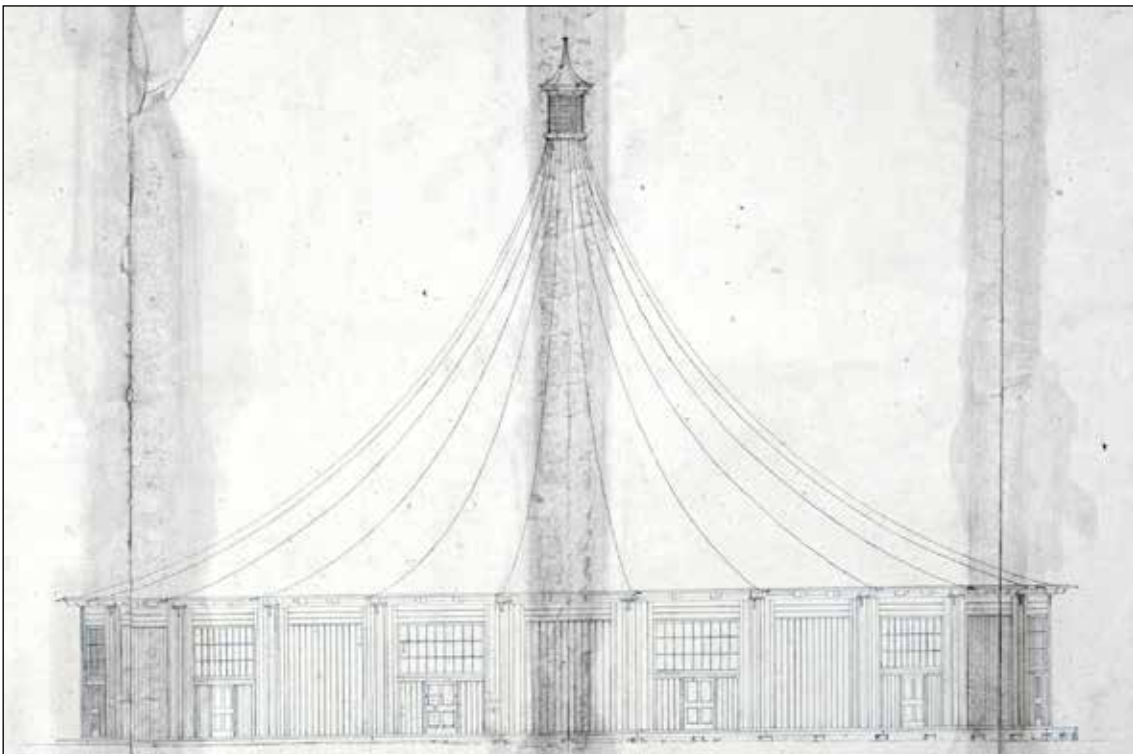


Fig. 13 External elevation of Nash's 'tent room' at Carlton House, May 1814. The structure's walls appear to have been covered with decorative boarding and inset with twelve entrances. (The National Archives, ref. WORK 43/576; colour-adjusted)

Although the designs now in The National Archives are unsigned, they are given the date May 1814. On the back of the floor plan is what appears to be a sketch of the overall layout of the principal temporary rooms, roughly laid out as a cross, with the 'polygon' at the centre (Fig. 14).¹³⁴ Seemingly, a model was made of the building at this time; in 1830 reference was made to a model of the Rotunda enriching 'the surveyor general's room at the Office of Works', and in 1963 the Rotunda Museum still contained the 'model on which Congreve planned the Grand Fete of 1 August', which included the 'polygon'.¹³⁵ Design work by Nash and his assistants appears to have been completed less than a month before the proposed visit of the Allied Sovereigns, leaving very limited time for completion of the temporary scheme. Unsurprisingly, only two lesser temporary rooms were erected in time for the reception of the Allied Sovereigns in June, and it was not until July that the whole suite was 'used for the first time'.¹³⁶

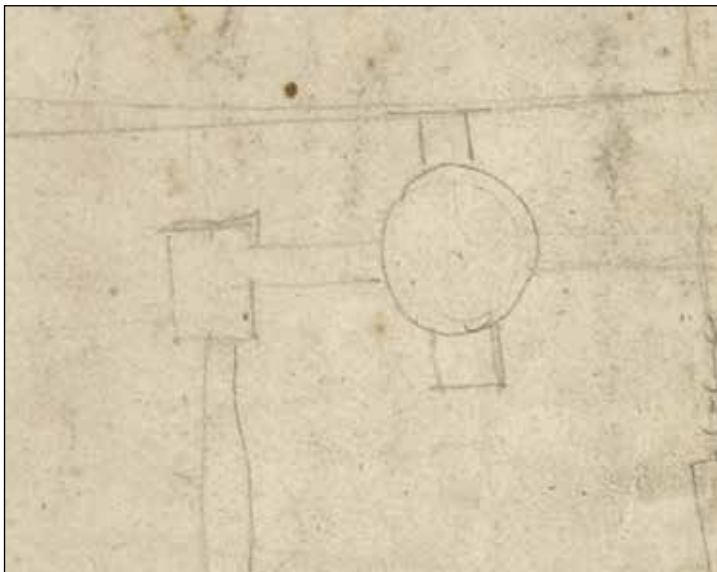


Fig. 14 Sketch plan of May 1814, showing the proposed layout of the temporary rooms to the south of Carlton House, with the Rotunda in the centre. The eastern promenade room lies concealed under the canvas backing tape to the right. See also Fig. 17. (The National Archives, ref. WORK 43/573, verso)

The only one of these temporary buildings for which there is visual evidence is the 'polygon'. Although it survives at Woolwich, its form has been somewhat altered, and the discovery of the original designs is therefore of key significance. Full descriptions of the building's use and internal fittings will follow, but in terms of the architectural drawings, what we see is a twenty-four sided structure in the form of a huge bell-tent, with a high, pointed roof. This roof, as with other temporary structures of the period, was of painted oil cloth, and was supplied by Mr James Baber.¹³⁷ The fact that it was incomplete – in 1815, Nash referred to the roof being 'never properly finished' – is another sign of the rushed building activity.¹³⁸ The exterior walls are set back beneath deep eaves, and appear to be decoratively boarded, a supposition borne out by later references (see Fig. 13). The boards are likely to have been painted with stripes, as was conventional with tented buildings. Doors with large window openings above are placed in alternate sides of the building, so there are – presumably – twelve in total. Some of these faces would have been obscured by the temporary structures which adjoined the Rotunda. At the top of the roof is a louvred lantern, which served to ventilate the building and may have helped sound to travel.

It is carried by a remarkable trussed roof, which in 1830 was described as having ‘no equal but the dome of St. Paul’s Cathedral’.¹³⁹

Inside the Rotunda, a second layer of canvas is shown hung from the roof, providing a ceiling. Twenty-four columns or posts run around the building’s inner edge, set slightly inside and apart from the outer walls. From the evidence of the plan, these posts seem to have been of timber with a cast-iron core (see Fig. 10). The outer walls are joined to these inner posts by arched braces – also of ironwork, according to the cross-section (see Fig. 12) – and iron arched braces are similarly used to join the posts themselves. The resulting spaces formed alcoves or recesses in which people could sit, and they remain recognisable in the Rotunda as rebuilt at Woolwich.

As existing, the Rotunda has a large Doric column at its centre (see Fig. 54). However, there can be no doubt that as originally designed the roof was self-supporting, and there was no central column. The ground plan shows a circle of twelve posts, slightly smaller than those around the inner edge but still with an iron core, set at the centre of the structure. These formed a temple which housed the orchestra.

In terms of style, the Rotunda owes a great deal to the tented buildings discussed elsewhere in this report – for example, the Swedish *corps de garde* of F. M. Piper.¹⁴⁰ It most closely resembles a bell-tent – interestingly, a form used in the fourteenth century, which would have been familiar to Edward, the Black Prince, on whom George modelled himself. However, the Chinese style is also evident, especially when one compares the designs with a building such as the Chinese Pavilion, Fagervik, Finland (c. 1790). Chinoiserie was well-established throughout Europe by the early nineteenth century, and Nash may well have taken his inspiration for the profile of the tent’s roof, in particular, from Chinese-style garden buildings. The ‘polygon’ would, it seems, have been designed to fit in with the larger scheme of temporary buildings used in summer 1814 – especially those used for the Grand National Jubilee, which included a Chinese bridge and pagoda – and Eastern influences are known to have been very much in Nash’s mind at this time.¹⁴¹

In 1817 Nash was to use the same tented roof profile at the Brighton Pavilion, for the so-called ‘pagoda’ roofs of the Music and Banqueting Rooms, discussed later in this report (see Figs 68–69).¹⁴² Of these roofs, John Morley writes that ‘Nash may have been influenced in the choice of pagoda by the success of the ballroom built in 1814 to house the celebrants of victory’.¹⁴³ It is worth noting that the building work at Brighton involved many of the same workmen who had taken part in the erection and fitting out of the Rotunda – William Nixon, for example, and the firms of Bailey & Saunders, Ashlin & Collings and Parker & Perry. Thus, the design of the Rotunda was clearly to the Prince Regent’s taste, and was considered stylish and worthy of imitation.

In its form, the Rotunda would also have called to mind certain key sights of the popular pleasure gardens of the period. Both Vauxhall and Ranelagh Pleasure Gardens featured ‘Rotundas’. That at Vauxhall (c. 1750) measured seventy feet in diameter, and was originally designed to commemorate Frederick, Prince of

Wales (Fig. 15).¹⁴⁴ Its decoration included four large canvases by Francis Hayman depicting British victories in the Seven Years War. The Rotunda contained an orchestra, and had a domed roof 'fluted on the outside, and painted within in the resemblance of a shell'. The roof was 'so contrived that sounds never vibrate under it; and thus the music is heard to greatest advantage'.¹⁴⁵ Under the building's sash windows were sixteen busts of 'eminent persons' with 'oval looking-glasses' above.¹⁴⁶ It was said that 'in all these glasses the spectator, standing under the balls of the great chandelier, might see himself reflected at once, to his pleasing wonder'.¹⁴⁷ The Rotunda at Ranelagh Pleasure Gardens in Chelsea (opened 1742) – Vauxhall's great rival – was based on the Pantheon in Rome, and measured 150 feet in diameter (Fig. 16). Its soaring interior was painted by Canaletto in about 1751; the building was used for the last time in 1803, and was demolished two years later. Such gardens served as venues for national celebration, and the style of their buildings – exotic, playful and theatrical – was clearly considered appropriate for the jubilant rejoicings of 1814. Like such buildings, the Rotunda at Carlton House was used to promote Britain's achievements in the arts and sciences.

Most importantly, the Rotunda captured the military interests of the Prince Regent, and would have been seen as highly appropriate for the occasion. The rivalry between the Prince and Napoleon must have proved influential, for there is a sense that George was trying to recreate a scene of triumph familiar to Napoleon, Wellington, the Black Prince or any of the great military heroes. Characteristically for



Fig. 15 View of c. 1770 showing the interior of the Music Room at Vauxhall Gardens, London, built in c. 1750 to commemorate Frederick, Prince of Wales. (© Museum of London)



Fig. 16 The soaring interior of the Rotunda in Ranelagh Gardens, Chelsea, opened in 1742 and demolished in 1805. It is shown here in a print of 1794, based on a painting of c. 1751 by Canaletto. (© Museum of London)

the Prince Regent, his military tent was placed in his back garden, rather than on the battle field.

The question of responsibility for the building's overall design has been a source of some debate, and is further discussed separately elsewhere in this report (see pp. 108-9). In the *History of the King's Works*, J. Mordaunt Crook and M. H. Port state that the 'polygon' was 'probably the result of a collaboration between Nash and Sir William Congreve', the latter Comptroller of the Royal Laboratory at Woolwich, having taken on the post following the death of his father and namesake in April 1814.¹⁴⁸ Certainly the two were working together at this time – as has been noted, Congreve was closely involved in the Grand National Jubilee of 1 August 1814 (see p. 11) – but there seems no proof for Crook and Port's assertion. Congreve's chief area of expertise was ordnance and firepower (he was inventor of the 'Congreve rocket'), hence his design of the Temple of Concord, which served as the 'launcher' for the extravagant firework display of 1 August (see Fig. 1).¹⁴⁹ There is no reason to assume that he made any major contribution to the design of the Rotunda and indeed, the building seems easily attributable to Nash, especially when one considers the 'pagoda' roofs of the Brighton Pavilion.

However, Nash may well have been assisted with the structural side of the design. According to T. F. Hunt, writing in 1830, the roof of the Rotunda 'was *designed or invented* by, and executed under the direction of, the late William Nixon, a modest and retiring man, of rare worth and talent'.¹⁵⁰ Hunt is not an entirely reliable source – he refers to the Rotunda as 'octagonal' – but the point may have some basis.¹⁵¹ William Nixon (d. 1826) – who had been placed at Carlton House by the late

Surveyor-General, James Wyatt, as an additional officer to superintend works – was clearly a key figure, and developed an excellent working relationship with Nash. Nixon later supervised the works at Brighton, and also served as superintending Clerk of the Works at Buckingham Palace until his death in 1826. In August 1818 Nash stated that Nixon built the Rotunda ‘under my directions’, and the following month asked the Surveyor-General, Benjamin Stephenson, ‘to whom he [Nixon] shall explain the construction of the building and advise on the taking of it down’.¹⁵² At that time, Nixon was indispensable at the Pavilion, for Nash writes that ‘he [Nixon] cannot stay longer than Monday or Tuesday as the works at Brighton are extremely urgent and so difficult of execution that I cannot trust him a moment to be away’.¹⁵³ Nash also wrote of Nixon being ‘the most diligent attentive and the most honest Clerk of the Works that I have ever met with’.¹⁵⁴ It would be most interesting to know more about the background and life of William Nixon but, as yet, very few details have come to light (see p. 108).

The Wellington Fête

Only two of the temporary structures were ready for the visit of the Allied Sovereigns in June 1814. The ‘polygon’ and the remaining buildings were finally completed in the following month, too late to be seen by most of the illustrious visitors, who had departed on 27 June. However, the timing was just right for the further celebrations held in honour of the Duke of Wellington. On 21 July the Prince Regent hosted the so-called ‘Wellington Fête’, when ‘the temporary erections in the gardens of Carlton-house, which have been so long in preparation, were used for the first time’.¹⁵⁵ The event has been described as a fête held ‘in honour of the Queen [Charlotte]’, a proposition supported by the details of the card of invitation.¹⁵⁶ According to (Sir) Thomas Lawrence, this was as follows:

A Ball
The Lord Chamberlain is commanded by
The Prince Regent
to invite
to a DRESS PARTY on Thursday
evening the 21st of July at ten o’clock
to have the honour of meeting
Her Majesty the Queen.¹⁵⁷

However, the *Annual Register* opened its comments for 21 July by stating that ‘The Prince Regent gave a superb fête to Field Marshal the Duke of Wellington’ and the scheme of decoration used for the fête, as well as contemporary comments, make it clear that this was accurate.¹⁵⁸

The Wellington Fête was the most extravagant ever staged by the Prince at Carlton House, and was designed to display to best effect the artistic, technical and military glories of Britain. The prestige of the country had reached a peak, not least because

of Wellington, who was portrayed – alongside the Prince Regent – as Britain's hero. The *Annual Register* – the chief source of information about the fête – commented that 'the entertainment exhibited a splendour and magnificence which have probably never been exceeded in this country'.¹⁵⁹

A total of 2,500 guests were invited, including members of the royal family, foreign ambassadors, ministers, officers of state and 'a numerous assemblage of the nobility and persons of distinction'.¹⁶⁰ According to the *Annual Register*, the large number of officers present, many of whom had served under Wellington in the Peninsular Wars, gave the entertainment 'the appearance of a military fête'.¹⁶¹ The Dukes of York and Wellington both 'wore the new Field-Marshal's uniform', and were adorned with orders, whilst the Prince Regent himself 'was dressed in regimentals, wearing his English, Russian, Prussian, and French orders'.¹⁶² Invitations were not demanded at the main door, 'it being of course held that no one would presume to come who had not an invitation', and from nine o'clock a steady stream of guests was greeted by the Prince's equerries in waiting, and conducted from the brilliantly illuminated courtyard into the Hall, Tribune and Grand Staircase, and so down into the basement.¹⁶³

The ballroom (that is, the Rotunda) was attached to the South Ante Room of Carlton House by a short 'temporary vestibule', which was 'decorated with plate-glass, and white and rose coloured draperies' (see Fig. 10).¹⁶⁴ Such draperies, erected in all the temporary buildings, were the work of the upholsterers and cabinet-makers Tatham, Bailey & Saunders, who were also responsible for fitting the curtains, tassels, ropes, calico, druggets and – indeed – much of the other decorative work.¹⁶⁵ The vestibule also contained at least one mirror, hired from Ashlin & Collins and measuring 114 by 42 inches, and seems to have been lit by 'one 5 light patent Lamp Lustre pull down with rich gilt ornaments & Baloon of spangles'.¹⁶⁶ Whilst the Prince Regent and other members of the royal family seem to have entered the ballroom by this vestibule, their passage elsewhere may have been segregated; the building accounts make mention of 'Her Majesty's Passage' and the 'private passage', though their location is not clear.¹⁶⁷

After passing through the vestibule, the guests would have found themselves inside the polygon, which must have been impressive for its size alone. According to the *Annual Register*, the building measured 120 feet in diameter, though Thomas Lawrence reckoned it to be 136 feet and Colvin states categorically that it was 116 feet, covering an area of 10,600 square feet.¹⁶⁸ Farington, in his diary, recalled Lawrence stating that it 'was said to be larger than the late public building called "Ranelagh"', though this was certainly an exaggeration.¹⁶⁹

The basics of the structure have been given, but to reiterate, around the inner edge of the tent were twenty-four spaces, described as 'circular recesses' by Thomas Lawrence.¹⁷⁰ According to the evidence of the external elevation, twelve of these would have contained doorways and windows, and the other twelve contained 'seats for the company' (see Fig. 13).¹⁷¹ Each recess appears to have been groined; the recesses are shown as such on the plan (see Fig. 10), and the *Annual Register* states that 'each side of this spacious room was groined and supported by fasces ornamented with flowers'.¹⁷² The term 'fasces' describes the columns treated as

bundles of rods (see Fig. 45). The inner canvas ceiling – the ‘elegant umbrella roof’ of the *Annual Register* – rose from those braces placed parallel to the outer walls, and was ‘decorated with large gilt cords, and painted to imitate white muslin, which produced a very light effect’.¹⁷³ The ‘gilt cords’ recall those used in fourteenth-century tents, as well as those of the popular tent-rooms. The Rotunda’s roof terminated in a ventilator; it was noted at the time that all of the temporary rooms were notable for the ‘great attention paid to their ventilation’.¹⁷⁴ Each of the groined recesses ‘were decorated with muslin draperies and eight large plate-glasses, round which the draperies were elegantly disposed’.¹⁷⁵ The glasses (mirrors) were hired from and fixed by Ashlin & Collins, and ranged in size from 76 by 60 inches to 112 by 60 inches.¹⁷⁶ The floor of the recesses, between the pillars and the walls, was covered with crimson drugget, and the ‘pannels’ (walls) by ‘Muslin Draperies & Curtains’.¹⁷⁷ The door openings were covered with ‘rare Color Calico Curtains’ hung from brass rods, and the windows by curtains of muslin.¹⁷⁸

The floor of the Rotunda was ‘raised upon short pillars’, in what proved to be a fruitless attempt to protect the vegetation beneath.¹⁷⁹ At its centre, raised on steps, were ‘slight pillars ornamented forming a Circle in which sat a Band of Musick’.¹⁸⁰ This took the form of a temple, and can be just made out on the cross-sectional elevation, bearing what seems to be a domed roof (see Fig. 12). The steps and the orchestra area were both covered in green baize by Tatham, Bailey & Saunders.¹⁸¹ The slight structure was heavily covered with flora and fauna (provided by Francis Carbery), for the *Annual Register* described it as ‘a garland of artificial flowers in the shape of a temple, connected by a very large gilt rope from the roof’.¹⁸² Twelve floor compartments radiated out from the twelve pillars at the centre towards the recesses at the sides. These were ‘chalked with elegant devices ... for twelve sets of dancers’. This was the work of George Glover, who submitted a bill of £20 for ‘chalking the floor of ye new BallRoom at Carlton House in Twelve Setts of Country Dances, Circles and other Dances’.¹⁸³ Seats were provided around the main area of the orchestra, and there was also at least one sofa, for Thomas Lawrence noted how the Queen and the Princesses ‘sat on a sopha in the Circular Apartment’.¹⁸⁴

The *Annual Register* describes the Rotunda as illuminated by ‘twelve glass lustres with patent lamps’.¹⁸⁵ The lustres are likely to have been those ‘made on purpose for Rotunda’ by Parker & Perry, and are described as being ‘mounted with 2 large laurel bands & rich foliage Borders’. A mention of twenty-four lamps immediately follows this item, these being ‘in form of Tent’.¹⁸⁶ These tent-shaped lustres are, in particular, a source of great interest, and were clearly a theme; as we shall see, Parker & Perry provided similar pieces for some of the other temporary rooms.¹⁸⁷ Parker & Perry also specially made twenty-four ‘White Glass lamps for 2 light Patent Burners ... to hang between pillars in Rotunda’, whilst an antique alabaster lamp was suspended from the centre of each groin.¹⁸⁸ It may have been these, described as ‘24 opaque lamps’, which were lent in 1815 to John Nash for his house on the Isle of Wight.¹⁸⁹

Attached to the Rotunda were further temporary buildings, so that the ballroom formed the centre of a cross, elongated along its east-west axis (Fig. 17, and see Fig. 14). To the south, directly opposite the main entrance from Carlton House, was a small rectangular tent, termed the ‘Refreshment Room’ in accounts.¹⁹⁰ The *Annual*

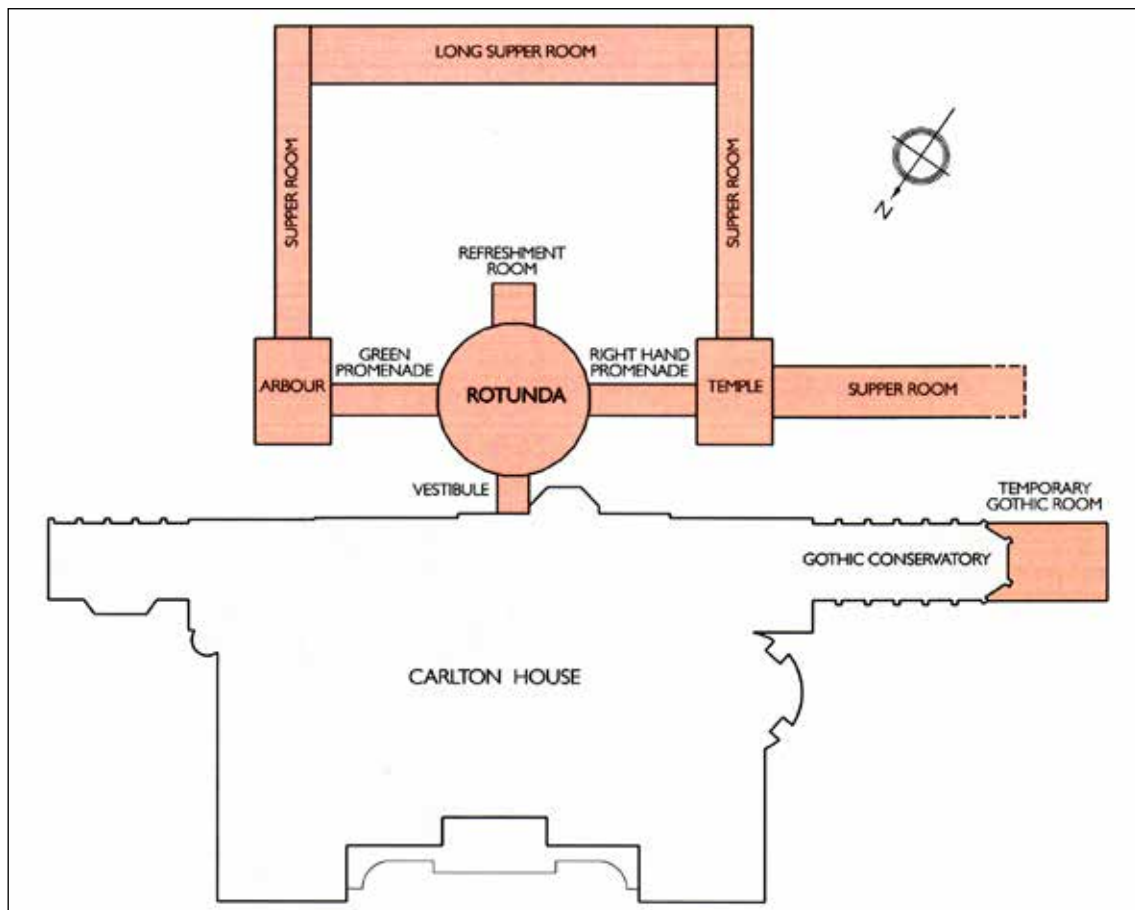


Fig. 17 Reconstructed plan of the temporary structures built in the gardens at Carlton House, including the Rotunda, first used for the Wellington Fête of 21 July 1814. (© Emily Cole/Andy Donald, Historic England)

Register described this as containing ‘tables for tea, coffee, ices, and fruits of various sorts from the royal gardens’.¹⁹¹

On the east and west of the Rotunda – extending left and right, as one entered from Carlton House – were large covered promenades. Both had boarded floors covered with druggets, as – in fact – did most of the temporary rooms. The promenade room to the west was ‘decorated with white draperies, and ornamented with rose-coloured cords’.¹⁹² It featured four recesses lined with muslin draperies, and a number of lustres supplied by Parker & Perry; three were placed in the centre, ‘the middle one very richly ornamented with paste spangles in form of Tent’, and four elsewhere in the same room were ‘very richly ornamented with paste spangles, the same pattern made on purpose’.¹⁹³

At the end of the right-hand promenade, visible from the Rotunda, was a Corinthian temple, ‘terminating with a large mirror, over which was a brilliant star, and the letter W. in cut glass’.¹⁹⁴ In front of the mirror was placed a marble bust of the Duke of Wellington, executed by Peter Turnerelli (1774-1839). This bust – seemingly that on long-term loan from The Royal Collection to English Heritage – can now be seen at Walmer Castle, Kent (Fig. 18).¹⁹⁵ The bust was placed on a ‘verde antique column’, hired for the occasion from Tatham, Bailey & Saunders, and ‘formed an attractive



Fig. 18 (left) It was seemingly this marble bust of the Duke of Wellington by sculptor Peter Turnerelli, now on loan to Walmer Castle in Kent, that was displayed in the temporary 'Corinthian temple' in the gardens of Carlton House for the Wellington Fête of 1814. It was said to form an 'attractive and appropriate object' when seen from the Rotunda. (Royal Collection Trust/ © Her Majesty Queen Elizabeth II 2020)

and appropriate object from the polygon-room'.¹⁹⁶ The idea of placing a bust in front of a mirror may derive, in part, from the Vauxhall Rotunda, where a similar arrangement had been used to good effect. The temple was floored with mauve drugget, and was hung with curtains, draperies, ropes, and tassels.¹⁹⁷ Parker & Perry supplied one 'very rich lustre ... with snake branches & vase of paste spangles in centre', at the cost of £15 15s.¹⁹⁸

The promenade room to the east of the Rotunda was similar in shape to that on the west – long, and relatively thin – but stood out for its green colour. The *Annual Register* describes it as 'another spacious promenade decorated with green calico', and it is referred to in the accounts as the 'green promenade room' or the 'large room hung with green calico'.¹⁹⁹ The room was lit by three large lustres, again supplied by Parker & Perry, 'one very rich Turkish Top & Tent of the finest paste & Baloon of spangles & paste icecles suspended from leaves on Bronze Ring'.²⁰⁰ Both promenade rooms had windows, for those of the green room are described in accounts as being covered by muslin curtains.²⁰¹

The green promenade room also contained twelve allegorical transparencies, 'pictures made with translucent paints on materials like calico, linen, or oiled paper and lighted from behind in the manner of stained glass'.²⁰² Their subjects were the *Overthrow of Tyanny by the Allied Powers*; *Assembly of the Powers for the General Peace*; *Arrival of the Allied Princes in London*; *Arrival of the Allied Princes in Paris*; *Passage of the Allied Sovereigns from France to England*; *Agriculture in England*; *Victory and General Peace!*; *Commerce of England*; *Union of the Seine and the Thames with the Ocean*; *Military Glory*; *The Arts in England*; and *Emancipation of Holland*.²⁰³ It seems obvious that these were specially commissioned at a time when it was envisaged that the temporary buildings would be ready for the reception of the Allied Sovereigns, for there is nothing about the Duke of Wellington in the scheme. It has been thought that their design and execution was the work of Thomas Stothard

– Stothard was already working on a transparency for the Grand National Jubilee (see p. 11), and certainly painted a transparency for a supper room at Carlton House in 1814, though its subject is unknown.²⁰⁴

However, the accounts show that in January 1815 ‘Mr Pugin’ was paid for ‘13 transparencies, which were used in the Garden Room on the Night of the Fête’.²⁰⁵ This was A. C. Pugin (1768/9-1832), a well-known artist and illustrator, and father of the famous architect A. W. N. Pugin. A. C. Pugin had a strong connection with John Nash – he worked as a draughtsman and illustrator for the architect from the 1790s right through until his death – and was clearly an obvious and easy choice for the commission. In fact, the majority of the transparencies may have been the work of Pugin’s brother-in-law and fellow artist Louis Lafitte (1770-1828). Lafitte was staying with Pugin during 1814, and already had extensive experience of producing such works; for example, Lafitte carried out the temporary decorations for Napoleon Bonaparte’s second marriage in 1810, and in 1816 was to work on the transparencies for the marriage of Charles Ferdinand, Duke of Berry. At the time of his death in 1828, Lafitte had in his possession several works connected with the Wellington Fête: seven sketches for ‘allegorical compositions’, a sepia drawing of *Neptune calming the Tempest*, five ink drawings for ‘frises’, and a large image (possibly the original transparency) of the *Union of the Seine and the Thames*.²⁰⁶

The green promenade room terminated in an arbour, in a position corresponding with the temple to the west and directly aligned with it. It was described as being ‘in different compartments formed with laurel branches, as emblems of victory, and decorated with rare and beautiful plants brought from Kew gardens: in these were tables, with a variety of refreshments’.²⁰⁷ The last point explains why the arbour was termed the ‘refreshment room’ in Jutsham’s books.²⁰⁸ Both the arbour and the main refreshment room, at the south of the Rotunda, had windows covered with muslin curtains.

In addition to this principal cross of tents, numbering six – that is, Rotunda, refreshment room, right-hand promenade, temple, green promenade, arbour – there were a number of supper rooms. Two opened from the temple – one to the south, and the other, seemingly, to the west, parallel to Carlton House. These were both kept closed ‘by folding doors concealed by a white drapery’ until supper was announced in the early hours of the morning, and were ornamented with ‘regimental silk colours belonging to the ordinance’.²⁰⁹ Another supper room extended to the south of the arbour, parallel with that extending south from the temple. This accommodated 300 guests, and was ‘fitted up with allegorical paintings’, as well as flags, ‘as emblematical of our great military hero’.²¹⁰ At the far end of this supper room was placed a large sideboard and mirror, surmounted with the standard of England. It is probably this room that was ‘wholly devoted to the display of military trophies’, whilst the opposite supper room was ‘fitted up with naval trophies, and appropriate devices’.²¹¹ It seems that the two parallel supper rooms were joined by another tent – probably that referred to as the ‘long supper room’ in the accounts.²¹²

These principal supper rooms were extravagantly lit. Those extending south both featured three centre lustres ‘in form of long Tent & 4 tiers of the finest paste icecles’,

‘made on purpose’ by Parker & Perry.²¹³ In addition, one of the rooms had ‘4 lustres ... all made to correspond’, whilst the other boasted ‘4 Bronze lamps ... with tops’.²¹⁴ The ‘long supper room’ was lit by ‘6 large Centre Lustres made on purpose’, also in the form of long tents.²¹⁵

The supper room extending to the west of the temple, parallel to Carlton House, probably led towards another temporary room, that adjoining the Gothic Conservatory. Of this there appear to be no contemporary descriptions, though the *Annual Register* states that it was ‘calculated to accommodate 100 persons at supper’ and ‘added considerably to the splendour of the lower suit [*sic*] of rooms’.²¹⁶ Building accounts show that it was Gothic in style, and was fitted out by Tatham, Bailey & Saunders with draperies, curtains, ropes, tassels and drugget.²¹⁷ It contained a mirror, measuring 84 by 52 inches, supplied by Ashlin & Collings.²¹⁸

There are, similarly, no contemporary descriptions of the temporary room erected on top of Nash’s Corinthian Room, the ‘temporary passage by the blue velvet room’, or the temporary staircase leading from the ‘Small Blue Velvet Room to lower apartments’.²¹⁹ However, it is recorded that the temporary passage contained ‘a Pair of large Porcelaine jars of octagon form, Blue Ground, mounted in Ormolu Rung handles, Chimera Heads forming fountains’. These were sent to Brighton in March 1819.²²⁰ As the Blue Velvet Room served as the audience room for ambassadors and ministers of state, it seems possible that such guests were once more offered use of the room to which they were accustomed. Remarkably, these temporary structures were still in situ in 1822, when Nash mentions ‘a temporary room and staircase made of wood and covered with canvas’. The need for ‘continual repair’ was noted and Nash presumed that the buildings would soon ‘be taken down’.²²¹

The weather on the night of the 21 July was fair, and ‘the gardens were brilliantly illuminated’, affording ‘an agreeable promenade’.²²² The Queen, with the Princesses Augusta and Mary, arrived at ten o’clock, attended by a party of yeomen of the guard and footmen with chambeaus. They entered the garden from the Park, having travelled from Buckingham House, and were received at the library on the basement floor by the Duke of Kent. Half an hour later, the royal party entered the Rotunda, ‘the Queen leaning on the Prince Regent’s right arm’. The Queen and her son were followed by the Duke of Kent and Princess Augusta, the Duke of Cambridge and Princess Mary, the Princess Sophia of Gloucester, and – later – by the Duke and Duchess of York. As the party promenaded around the ballroom, the Prince Regent’s band played ‘God Save the King’ and ‘The Prince Regent’s March’. A ‘very numerous band for country dances’ then took their place, and dancing began.²²³

When Thomas Lawrence arrived at just past eleven o’clock, he found ‘about 14 couples dancing, among whom were some of the Princesses’. The rest of the company ‘were promenading or in conversation’.²²⁴ Lady Frances Shelley – who ‘walked about with Wellington from supper-time until we went away at five in the morning’ – reported how the Duke commented, when watching the dancing of his aides-de-camp: ‘How would society get on without all my boys?’²²⁵ According to Lawrence, Wellington ‘made a striking figure’ and ‘much attention was paid to him

wherever he moved'.²²⁶ Alas, Wellington does not seem to have mentioned the event in any of his correspondence.

Early in the morning – two o'clock according to the *Annual Register*, and three according to Lawrence – the company sat down to supper, which was 'served hot'.²²⁷ The royal party apparently supped 'in the two rooms which were erected to receive the Emperor of Russia and King of Prussia, where the cloth was laid for 120'.²²⁸ It would be hard to identify these rooms with certainty; possibly the reference is to the two long parallel supper rooms, which extended southward. After supper was finished, dancing recommenced. When Lawrence left Carlton House soon before five o'clock, the Queen was still there, and it was only after six in the morning that the remainder of the guests finally took their leave.

Subsequent History of the Rotunda at Carlton House, 1814-18

The Rotunda, together with some of the other structures erected for the Wellington Fête, were to remain at Carlton House for some considerable time after July 1814. This was in direct contrast to the buildings erected for the Grand National Jubilee; the Temple of Concord (see Fig. 1), for example, was dismantled within two months, and its remains auctioned in October 1814. It was also in contrast to stated plans: in September 1814, a London newspaper commented, 'It is said that the Rotunda and adjoining buildings, erected in the garden of Carlton-house for the PRINCE REGENT's fêtes, will be pulled down immediately'.²²⁹

In fact, the Carlton House tents seem to have remained with many of their fittings intact for some months after July. Possibly the Prince Regent was still revelling in the associations of glory that the buildings called to mind, or – on a more practical level – he intended to make use of them again. Certainly, the temporary buildings must have been considered a success, or they would have been removed before autumn, as was usual. The loan of twelve twenty-four light lustres for the Rotunda was extended by Parker & Perry from 1 September until the 10 October 1814, and it may be that the temporary suite *was* used again during the latter part of 1814.²³⁰

However, in the quarter ending 5 January 1815 Tatham, Bailey & Saunders submitted a bill for: 'taking down the Calico Roofs, Walls, Draperies, Curtains, Muslin Curtains, Draperies, Ropes, Tassels &c taking up Druggets, taking down Artificial Flowers, Gilt Ropes, Flags, Cables &c and other decorations in all the Temporary Rooms & Passages in Gardens. Binding, taking an account, marking and packing and stowing the whole away'.²³¹ The public rooms of Carlton House were clearly shutting down for the winter, for Tatham, Bailey & Saunders were also asked to cover the furniture and curtains in the state apartments and basement rooms with 'Brown Holland covers'.²³² In January 1815 '2 large Druggets' which had lined the floors of the right- and left-hand promenade rooms were reused at Carlton House.²³³ In April the grey drugget 'which belonged to the refreshment Room opposite the entrance to the Polygon Room' was taken up, and removed to the neighbouring Warwick House, the residence of Princess Charlotte.²³⁴

On 17 April 1815 John Nash wrote to the Surveyor-General of the Office of Works, stating that:

I have His Royal Highness the Prince Regent's Commands to remove a small portion of the temporary buildings in the garden of Carlton House ... I beg the favour of you to direct the dispersal of the materials and take the liberty to advise the offering them for sale to the tradesmen who furnish'd the different articles – which is usual with such sort of buildings and in the event of their declining to purchase them to sell them by auction – as I am persuaded it will not answer the purposes of economy to put them into store.²³⁵

Colonel Stephenson was quick to reply to Nash's letter, and confirmed that he would 'direct the Labourer in Trust belonging to that Palace to attend and take your instructions for removing the same'. Stephenson continued: 'I shall certainly attend to your suggestions for the disposal of the materials of the Buildings to be taken down, having already proposed that they should be sold but had not determined upon the best mode of selling them, being convinced they could be of little service in the stores of the Department'.²³⁶

Some of the materials were used at Warwick House, then in the course of being rebuilt. Nash wrote to Stephenson in March 1815 explaining that 'the Hall above the ground floor' was to be built of the old timber from the temporary buildings, and:

boarded with the old boards within and without and lined with the old Canvas repaired – the rafters and covering to be formed out of the same temporary buildings and covered with the old floor cloth covering repainted – the Joists and Floor to be made also out of the old Timber but the boards to be planed ... the windows lighting the Hall to be two of the Windows from the buildings to be taken down fitted, repaired and made good to their new situations.²³⁷

In May 1815 Nash wrote again to Stephenson, informing him that a further part of the temporary buildings were to be removed. However, he makes particular note of 'the new polygonal room intended to remain'. Of this, Nash states that 'Mr [James] Baber's oil cloth which covers the roof was never properly finished, and Mr Baber should be called upon to repaint it, or at least such parts of it as admit the wet'.²³⁸ Of the adjoining structures, those to the north, east and west 'will be required to be kept up' and the 'roof and sides to be made weather proof'. This latter was made necessary as 'at present those buildings admit the weather in every direction'. Nash suggested that 'the boarding oil cloth and materials of the temporary rooms about to be taken down, and lately taken down, might be employed for that purpose'. The boarding 'would serve as the external enclosure' and 'the best of the oil cloth might be used in the roofs, and Mr Baber paint them permanently'.²³⁹

Again, Stephenson was quick to reply, reassuring Nash that the job would be done 'without delay', but asking for further clarity as to 'which of the remaining Temporary Rooms it is His Royal Highness's pleasure to have removed'.²⁴⁰ On 4

May Nash explained that ‘the temporary buildings which it is His Royal Highness’s commands to remove in Carlton House Gardens are the whole of them, except those communicating with the polygonal building North, South and West, and the building communicating with the Conservatory – also a small kitchen-building on the south side of the polygon’ (see Fig 17).²⁴¹ This is not entirely clear, for the building on the south side of the polygon is the refreshment room, presumably what Nash means by ‘a small kitchen-building’. It seems fair to surmise that the principal suite of Rotunda, with buildings to north, east and west and ‘kitchen’ on south, are what were to remain, along with the temporary Gothic room. Thus, the temporary buildings dismantled around this time must have been the supper rooms.

On 6 May 1815 Simon Brent of the Board of Green Cloth, the royal accounting agency, wrote to Stephenson alerting him that the Prince Regent ‘has signified his intention of using the Temporary Rooms in the Garden of Carlton House on the 18th of this month’, and stating that ‘it is necessary that they should be inspected and made fit for the occasion’.²⁴² Stephenson immediately contacted John Yenn, Clerk of the Works at Carlton House, asking him to inspect the temporary buildings ‘which are intended to remain’, and to ‘cause all necessary repairs to be done to render them fit for immediate use’. In addition, Yenn was to clear the gardens of all signs of the unwanted temporary buildings, and place the materials in store, ‘with as little delay as possible’.²⁴³ Stephenson asked Yenn to let him know ‘what repairs will be wanted to the Temporary Rooms which are to remain, and when the same can be completed’, but – although the Assistant Surveyor attended at Carlton House on 15 May in order to inspect the repairs – no written report appears to have been produced.²⁴⁴ It may be that lead was added to the Rotunda at this time, for in 1818 reference was made to the ‘old lead taken off the Polygonal building’, a material apparently not present when the Rotunda was originally constructed (see p. 49 and pp. 60-65).²⁴⁵

In March 1816 Stephenson made an attempt to avoid the rushed repairs of the previous year by asking whether or not the temporary rooms would be needed. On 25 March Simon Brent responded to Stephenson, at the request of the Lord Steward of the Household, stating that ‘his lordship has taken the Prince Regent’s pleasure with respect to the new fitting up of the temporary Buildings in Carlton House Gardens ... and that His Royal Highness has not any intention of making use of them at present’. Brent then reassured Stephenson by adding that ‘whenever His lordship may receive any commands on the subject he will gladly meet you and Mr Watier on the spot and consult as to the best mode of conveying HRH’s commands into effect’.²⁴⁶

In summer of that year the Prince chose to use the buildings once again, hosting a ball at Carlton House on 12 July. The floor of the Rotunda was once more chalked ‘in various devices’ by G. Glover, at a cost of £21.²⁴⁷ Parker & Perry cleaned ‘the 22 opaque lamps & Burners in the Rotunda’ – clearly still in situ – and made paper covers for them. The firm also made loan of twelve large lustres fitted up with 288 patent lamps ‘to hang round the Polygon Room’, and loaned ‘4 handsome Grecian Lamps for the Large Tent’.²⁴⁸ Farington mentioned the ‘Grand Ball’ briefly in his diary, for Thomas Lawrence had received an invitation, but gives no further

details.²⁴⁹ Information was, however, given by the press, and shows that the Rotunda was used as the ballroom, guests at the event including the Queen, the Dukes of York, Kent and Gloucester, Prince Leopold, and 700 members of the nobility and gentry.²⁵⁰

By late 1816 Carlton House itself was in a state of considerable disrepair, and was clearly falling out of favour with the Prince (see pp. 15-16). In December Nash informed the Surveyor-General that the Prince wished 'nothing but the common repairs, incident to the occupation of the building to be done at present'.²⁵¹ This point was again emphasised in July 1817, when Nash – speaking for the Prince – stated that 'no other repairs but such as are absolutely necessary should be undertaken'.²⁵² Several repairs had become 'absolutely necessary', and it was estimated that they would cost at least £9,000.

By summer 1818 the Rotunda and the other temporary buildings would no doubt have been in a state of considerable disrepair. Still, grand events were held, for Glover was paid £5 5s. for 'chalking the floor for the Ball at Carlton House' on 23 June 1818.²⁵³ Whether this relates to the Rotunda, or to another internal room at the palace, is not clear. The latter is most likely, especially as Glover again chalked the floor of the ballroom in July 1819, by which time the Rotunda was in its new home at Woolwich.²⁵⁴

The Dismantling of the Rotunda

On 7 August 1818 the Prince's private secretary, Sir Benjamin Bloomfield, informed Colonel Stephenson that it was 'the Prince Regent's Pleasure that the great circular Room in the Gardens of Carlton House should be removed from thence'.²⁵⁵ He further stipulated that 'it is His Royal Highness's desire that it should be transferred to Woolwich, there to be appropriated to the conservation of the trophies obtained in the last war, the artillery models, and other military curiosities usually preserved in the Repository of the Royal Artillery'.²⁵⁶ Thus, August 1818 marks a major moment in the history of the Rotunda.

The Prince's 'desire' was no doubt influenced by Sir William Congreve, a personal favourite of George, who was made an equerry in the Prince Regent's household in 1811. Congreve had been aware of – if not directly involved with – the Rotunda from its very creation, and would certainly have attended the Wellington Fête. Between 1814 and 1818 the Rotunda would have been a familiar sight to guests at Carlton House. Directly visible from the state rooms of both ground and basement levels, Congreve, Nash, the royal family and many others would have been continually reminded of its presence. Moreover, Congreve – who had succeeded to his father's posts in 1814 – would have been pre-occupied with the lack of space at the Woolwich Repository, and the Rotunda must have seemed a tantalising possible solution – it was attractive, practical and had strong military associations. Congreve's wish to obtain it must also have been considered something of an ideal arrangement by the Office of Works, in that it would save its staff the trouble of storing or selling the materials.

Certainly, the Surveyor-General of the Office of Works, Colonel Stephenson, took up the idea with alacrity. On 10 August he sent a copy of Bloomfield's letter to the Treasury, and suggested 'if their Lordships should be pleased to direct, the Great Temporary Circular Room now standing in the Gardens of Carlton House, being given up for the use of the Ordnance; that all the Expences of taking down, and removing this Building, be defrayed by that Department'.²⁵⁷ However, the building's future was not quite assured as yet. In response, R. Lushington of the Treasury Chambers acquainted Colonel Stephenson that 'as no new Expense by the Ordnance can be authorised, my Lords [Lords Commissioners of His Majesty's Treasury] are pleased to direct you in compliance with HRH the Prince Regent's wishes to take down and sell the materials of the said Circular Room, the proceeds thereof to be carried to account'.²⁵⁸

Despite the doubt over the Rotunda's future, Stephenson immediately set about planning how the building would be best dismantled. On 21 August 1818 he wrote to Nash regarding the safest method of taking it down. On 26 August Nash sent his extremely detailed reply, which will be quoted here in full:

The best course to take in pulling down the polygonal buildings in Carlton House gardens will be thus. After the boarded casing – the timbers filling in between the posts and the boarded floor – shall be removed and the outside covering taken off, a scaffold about 8 or 9 feet square should be erected in the centre – the cupola taken down to the main ribs and the hoops taken off which bind the upright timbers of the roof together and form the cylinder – then to take out the purlins on each side of any one of the ribs leaving the other purlins to steady the other ribs – when the rib is so disengaged raise the foot of it up from the plates by a jack the rib being suspended by the blocks of a triangle – and the upper end of the rib being also suspended by the blocks of another triangle on the scaffold – a guide rope at the foot of the rib will pull it over the plate outwards and at the same time disengage the upright timbers at the upper end of the rib from the rest of the uprights which together form the centre cylinder – and the rib being thus entirely separated and disengaged may be easily lowered down by the blocks of the triangles at each end – the other ribs one by one may be taken down in the same way – after which the joists of the floors may be taken up and the posts and the plates forming the walls taken down.

As the building has been constructed so as to take to pieces and be refixed – I advise that the posts and plates from the walls be numbered and marked a drawing being previously made of them with the like marks of the drawing – so that the timbers may readily come into their places should the building ever be put up again, there or elsewhere – and in like manner the floor the boarding of which has for that reason been framed in compartments as well as the joists – the ribs forming the roof

should also be drawn and marked, and numbered and the ribs taken down whole and the purlins marked and numbered.

If it is intended to sell the materials I am of opinion it were generally known and could be seen in its erected form it might be advantageously sold for re-erection as it would be applicable to many purposes. Sir William Congreve told me it would be desirable as a room for the Ordnance models, indeed I think it would be a useful building in any of the dockyards and other government establishments.

I should have answered your letter immediately but I could not find a drawing of the timbers.²⁵⁹

This letter is of paramount interest and importance for a number of reasons. Principally, it gives invaluable structural information about the Rotunda. But it also proves that at the time it was written – in the last week of August 1818 – the fate of the building had still not been decided. Additionally, it confirms the supposition that Congreve was responsible for the idea of using the Rotunda at Woolwich. Stephenson's reply of 26 August will likewise be quoted in full:

I have given Mr Wyatt who acts as labourer in Trust at Carlton House your detailed directions for taking down the Polygonal Building, and have desired he will wait upon you for such further instructions as will be necessary in the progress of so difficult an undertaking; for I conceive that the great size and weight of the Ribs, the height of the cupola, and the very nice mechanical construction of the whole Building will require more than ordinary care and abilities, to remove the same with safety.

The Expenditure that must attend the taking down a Building of this Description, and the still greater that must be incurred in erecting it again if ever wanted, including the several Drawings to be made of the different Timbers, &c. the casting and stowing away so considerable a Quantity of Bulky materials, with the great loss and damage which must always attend works of This Nature, have led to an opinion that the most prudent mode of disposing of this Building will be to sell it to the best bidder.

The application made by Sir W Congreve has been refused by the Treasury, who did not feel justified, in throwing upon the Ordnance, so heavy an Expenditure, as the taking down, removing, and re-erecting this Building, would necessarily entail upon that Department.

I have not yet been able to find any person inclined to purchase this Building – it shall agreeably to your recommendation remain standing for the present to afford any Purchasers you may have the

goodness to send, an opportunity of viewing the whole Structure in that state, as whoever purchases the same, will be required to take down, and remove all the timbers and materials at his own expence and within a limited time to be settled by agreement with this office.²⁶⁰

It is not known whether or not purchasers did view the Rotunda in situ at Carlton House. Nash asked Stephenson for further clarification – ‘do I understand you to say that you are willing to give the entirety of the buildings to anyone who will take it down grace of expence’, he wrote on 4 September – but was clearly fostering plans of his own.²⁶¹

On 30 August, Nash wrote to Stephenson providing further technical details about the Rotunda. He had ‘consulted Nixon who built it under my directions and he is of the same opinion with me that with the centre scaffold I proposed and the jacks triangles and blocks, the ribs may be taken down with great ease – and that the scaffold being erected and a competent number of men they may be taken down in a week’.²⁶² The architect then went on to mention a ‘proposition I had to make related to the application of the building as a Church ... when I come to town I will show you a design and calculation on that subject which if I am not mistaken will induce you to consider the circumstance’.²⁶³ This suggestion, although it seems remarkable, is entirely in keeping with Nash’s thinking at the time. Over the course of 1818, he and the other two attached architects of the Office of Works – Soane and Smirke – produced a number of designs for new churches at the request of the Church Commissioners.²⁶⁴ The Commissioners’ brief called for economic but dignified structures, seating as many people as possible in a relatively small space. ‘Seeing and hearing’ were of paramount importance.²⁶⁵ In the end, Nash submitted ten designs – Gothic and Classical in style – but the Commissioners seem to have been unimpressed, and nothing came of any of these ‘specimen’ projects.²⁶⁶

Unfortunately, Nash’s ‘design and calculation’ relating to the Rotunda does not seem to have survived – or has, at any rate, not been identified. Whether he planned to enlarge the building, or add a tower, will never be known. But Nash felt strongly about its viability and, perhaps, with good reason. The Rotunda was designed to house a large number of people, and was internally uninhibited by columns, so that sight and sound lines would have been excellent. Furthermore, it offered a very economical option, and could easily be adapted to suit. On 4 September Nash wrote to Stephenson asking: ‘Is the estimate of the church proceeding with – and how is it likely to turn out? I totally forgot to send a clerk to trace the outline I was so hurried the day I left you but as I wish to be completely prepared with all I have to say on the subject I write by this post to my office for a person to trace them and send them to me here’.²⁶⁷ Had Nash’s plans gone ahead, some significant input would have been required from the Office of Works, and it is possible that Stephenson was not as keen as Nash had hoped.

On 2 September 1818, the *Morning Chronicle* commented that ‘The Rotunda ball-room, in the gardens of Carlton House, is taking down’, a ‘great part of the timber frame-work being found in a decayed state’.²⁶⁸ Clearly, the process was more complicated and time-consuming than had been anticipated. The *Morning*

Advertiser provided further details: ‘when this building was erected, it was said to be so constructed that it could be taken down and put up again in three days, but a great number of workmen have been employed in its dilapidation now for nearly a week, and appear to have much to do.’²⁶⁹ On 10 September, the Treasury granted formal authority for the building to be taken down and the materials to be sold. An abstract of bills for the dismantling was submitted for the Michaelmas quarter of 1818, and gave details of the workmen. William Wyatt, Labourer in Trust at Carlton House, superintended the work, and also sorted and numbered the materials, a job for which he was paid £3 3s. The carpenter Jeffry Wyatt – who had been much involved in the erection of the Rotunda – charged the highest sum, £199 16s. 0½d. Then there were George Hutchinson, painter, who charged £6 18s. 7d., James Machell, smith, who charged £2 19s. 1d., and Francis Swinney, labourer, whose bill amounted to £41 5s. 11d. The total sum incurred in the dismantling was £210 10s. 4½d., nearly £44 having been deducted for ‘old lead’.²⁷⁰ William Nixon was involved in an advisory capacity, but does not seem to have charged for his time. By 7 October, it could be reported that the Rotunda had been ‘razed to the ground’, and soon afterwards its site was sown with fresh grass seed.²⁷¹

In the end, nothing came of Nash’s high hopes for a church, and the Prince and Congreve had their way. A deal was struck between the Prince Regent and Henry Phipps (1755-1831), Earl of Mulgrave, then Master of the Ordnance, who had to cover the costs for dismantling and re-erection. The building was to be ‘appropriated as a Respository for Medals and Specimens of different Articles belonging to this Department [Office of Ordnance] at Woolwich’.²⁷² The Earl of Mulgrave accepted the offer, but arrangements could not be finalised until authority was granted by the Lords of the Treasury. R. H. Crewe, Secretary of the Ordnance, wrote to the Treasury on 23 October requesting that ‘you will have the goodness to cause the requisite authority to be given to the Board of Works for the delivery of the Materials to the Ordnance, so that no time may be lost in carrying the Prince Regent’s Pleasure into effect’.²⁷³ Authority was duly granted by the Treasury on 29 October, although delivery of the materials of the Rotunda could only be made ‘upon payment ... of the expence which has been incurred in taking down the same’.²⁷⁴ Stephenson supplied the Ordnance with a full bill for the work, and on 2 November it was stated that ‘the Board have authorised the Treasurer of the Ordnance to make payment of that Sum to the Cashier of the Board of Works’.²⁷⁵ This final bureaucratic stage was completed in early November 1818, and on 16th of that month the press reported that ‘Part of the waggon train were on Saturday [14 November] employed in removing the frame work of the Rotunda erected in the garden of Carlton-house ... to the Arsenal in Woolwich’.²⁷⁶

Ironically, though characteristically, the Prince Regent was soon ordering a new temporary room to be built in the gardens at Carlton House. This was to be completed by 15 June 1819, and its estimated cost was £325. Clearly this was a modest affair – the lamps used in the Rotunda in July 1814 alone cost £1,134 – and Carlton House was very soon to be all but abandoned.²⁷⁷ Perhaps it is fitting that the only significant fragment of Carlton House known to remain is the Rotunda, a building intended to have only a limited life span, but which epitomised the ideals of the Prince Regent so precisely.

Historical Context

The Military Presence in Woolwich

The settlement of Woolwich has been closely associated with military and naval activity since the sixteenth century. In 1512 Henry VIII founded royal dockyards at Woolwich and Deptford – which continued to function until their closure in 1869 – and later stipulated that the Woolwich site should house the Navy's ordnance stores. While there is some evidence that experiments in ordnance and artillery were being carried out by the river at Woolwich in the late fifteenth century, it was not until Henry VIII's reign that the area then known as the Warren became home to the fledgling Royal Arsenal. Among the earliest buildings on the Warren site was Tower House (later Tower Place; demolished), which dated from 1545, and over the course of the following century gun making and testing were transferred to Woolwich. The defences of the site were greatly strengthened when Prince Rupert built a fort in 1667 to counter attacks from the Dutch. In 1671 the Crown acquired Tower Place and a further thirty-one acres in order to extend the ordnance stores, and in 1695 established the Royal Laboratory for manufacturing fireworks and munitions at the Warren. Following an explosion at the gun foundry in Moorfields in 1716, the Royal Brass Foundry was moved to the Warren in 1717. By the late 1770s the site had increased to over a hundred acres and was enclosed by an eight-foot-high brick perimeter wall. Woolwich's pre-eminence in developing and manufacturing weapons and armaments was formally acknowledged in 1805, when George III bestowed the title of the Royal Arsenal while on a visit to the Warren.²⁷⁸

The existence of the Warren made Woolwich the obvious home for the first two regular companies of field artillery – each comprising a hundred men – which were raised by George I on 26 May 1716 and formally constituted as the Royal Regiment of Artillery on 1 April 1722. Under the command of Colonel Albert Borgard (1659-1751), the Royal Artillery became a vital component of the British Army and by the eve of the American War of Independence (1776-81) had expanded to thirty-two companies and four battalions. Having outgrown its original accommodation in the Warren, the Royal Artillery commissioned new barracks on the north side of Woolwich Common, an impressive range of buildings constructed in 1774-77 and enlarged in 1801-8; by the close of this second phase of work, it was the largest barracks complex in Britain, housing around 3,200 men.²⁷⁹ The forces had been further supplemented in January 1793 with the formation of the first two troops of Royal Horse Artillery to provide mobile support for the cavalry. In 1801 the Royal Irish Artillery was absorbed as a consequence of the Act of Union (1800). Thus, at the start of the Napoleonic Wars in 1803, the British Army could draw on one hundred Royal Artillery companies – divided into ten battalions – and twelve Royal Horse Artillery troops.

Both before and after its formal institution in 1722, the Artillery came under the direct control of the Board of Ordnance, headed by the Master-General of the

Ordnance. Created in 1518 as the successor to the medieval Office of Ordnance, the Board of Ordnance was responsible for mustering both engineers and artillery in temporary 'trains' during wartime, these being disbanded in peacetime. This practice continued until 1716, when – at the same time as the first permanent units of artillery were raised – the Corps of Engineers was formed, with its headquarters also at Woolwich.²⁸⁰ The Engineer Corps – which consisted only of officers – was renamed the Corps of Royal Engineers by a royal warrant issued on 25 April 1787. In the same year, the first six companies of engineer soldiers came into existence under the title of the Corps of Royal Military Artificers, which from 1807 were also based at Woolwich; in 1813 their name was changed to the Royal Corps of Sappers and Miners. This separation between officers and soldiers finally came to an end on 17 October 1856, when the two corps were amalgamated into the Corps of Royal Engineers.

The evolution of the Royal Artillery and the Royal Engineers exerted a lasting impact on the architecture and landscape of Woolwich, both within the Warren and increasingly on Woolwich Common. Expansion of troop numbers during the eighteenth century necessitated the building of new accommodation blocks, such as the Royal Engineers Barracks (1803) and the Artificers' or Sappers' Barracks, later the Grand Depot (c. 1803-14; demolished in the 1960s and '70s). Further development came in the form of the Royal Ordnance Hospital (later known as the Connaught Barracks), which was constructed in 1778-80 on a site to the east of the Royal Artillery Barracks. In addition to these permanent manifestations of the military presence in Woolwich, the Artillery made daily use of Woolwich Common for practising manoeuvres and gunnery. The open ground to the north of the Ha-Ha – which ran east-west across the common – became known as the Barrack Field and was home to a battery by 1813.²⁸¹ An area of enclosed land to the north-west of the common was denoted the Repository Grounds by 1778; in that year, it was given over to the activities of the Royal Military Repository, whose development is discussed in full below.

The final element of the military presence in Woolwich was its educational role. In 1720 – only four years after the Artillery and Engineers were formally constituted as regular regiments – there was a proposal to set up an academy for educating and improving the minds of the young officers of both corps. In 1721 the first military academy in the country was established in Tower Place in the Warren and a mathematics master, Burnett Godfrey, was appointed. The academy proved desirable and in 1741 it was established by royal warrant as the Royal Military Academy, with the expressed aim of instructing 'the raw and inexperienced people belonging to the Military branch of this office, in the several parts of Mathematics necessary to qualify them for the service of the Artillery, and the business of Engineers'.²⁸² Known within Woolwich as 'The Shop', the Royal Military Academy provided both a theoretical and a practical training for the cadets. In September 1741 Martin Folkes (1690-1754), later President of the Royal Society and President of the Society of Antiquaries, was appointed Chief Master, together with a deputy, John Muller, and his assistant Samuel Derham, who were to instruct the cadets in 'the Practice', which consisted of practical gunnery, bridge-building, magazine technique and general artillery work. The academic curriculum provided instruction in arithmetic,

geography, algebra, trigonometry, conic sections, mechanics, fortification, land drainage, survey and levelling, gunnery, fireworks and artillery material.²⁸³ The staff were soon supplemented by a drawing master and a French master in 1743; later appointments included a fencing master and a dancing master, who remained on the staff until 1829, testifying to the lasting importance of providing a polite – as well as practical – education for the ‘gentlemen cadets’. From 1749 onwards the Royal Military Academy also employed model-makers, who were responsible for creating models of fortifications and earthworks, as well as of particular military engagements, that were used as teaching aids for the cadets. Larger premises for the Royal Military Academy – now known as the Old Royal Military Academy – were constructed on the south-eastern side of Woolwich Common from 1800 to 1806 to the designs of James Wyatt. Within the new building there was provision for a model room in the south-west wing.

The Early History of the Royal Military Repository

Within the context of the steady intensification of the military presence in Woolwich, the development of the Royal Military Repository in the late eighteenth century was of direct relevance to the re-siting of the Rotunda. The creation of the Royal Military Repository in 1778 – five years after the Board of Ordnance purchased land for the development of the Royal Artillery Barracks – was the work of William Congreve the elder (1743-1814), then a captain in the Royal Artillery. His experience as a lieutenant firework in Canada during the Seven Years War (1756-63) convinced him of the need to train the artillery how to manoeuvre heavy ordnance in difficult conditions. As Ian MacRea has commented, it was during the Siege of Louisbourg (1758) in Nova Scotia that the young Congreve and his fellow artillerymen were ‘exposed to logistical problems rarely encountered on the flat plains of Europe; steep cliffs, and an undulating terrain criss-crossed with ravines around a large, sheltered harbour, so that when William’s company were ferried by ship to set up their batteries, they would be “employed night and day in dragging their batteries over Dam’d bad ground for at least one and a half miles”’.²⁸⁴ To improve the mobility of ordnance, Congreve favoured use of light six-pounder and three-pounder guns and devised the single block trail carriage for hauling the guns, which began to be adopted by the artillery ahead of the American War of Independence.

In 1774 Congreve devised a full set of ordnance exercises, together with illustrative sketches, to show ‘how Guns and Carriages may be raised up any inclined plane, by means only of their respective Limbers, in an expeditious manner, and without exposing the Men employed to the least danger of being hurt’.²⁸⁵ The accompanying sketches demonstrated:

the purposes to which Limbers may be applied on many other occasions: such as to get Field Pieces over Ditches, Ravines, Inclosures or Lines ... To mount or dismount heavy Guns, when no Gyn is at hand; to get the Guns on Batteries with a far less number of Men than are usually employed in drawing them upon their platforms by bodily strength only. To raise any Carriages that may be overset on a march etc.²⁸⁶

Adoption of these exercises was urged by General James Pattison (1724-1805), Commandant of the Woolwich Garrison, and the matter was referred to General Williamson, Commanding Officer of the Artillery at Woolwich; he gave his approval and urged the Board to adopt Congreve's plans, which would 'give very usefull and necessary lessons to our officers in general'.²⁸⁷ As Major J. P. Kaestlin has observed, the 'Repository' was to be 'a school of ingenuity in the application of mechanical principles', exercises instructing cadets and officers in the effective use of 'ropes, pulleys, levers and gravity' to move the ordnance over obstacles.²⁸⁸

Invalided out of the American conflict in September 1776, Congreve made use of his position as aide-de-camp to Lord Townshend, Master-General of the Ordnance, to promote his ideas. In May 1778 George III instructed Townshend 'to build and staff a Repository for Military Machines at Woolwich, whereby the young officers and men of the Regiment shall be instructed in serving such ordnance that are essential to the service'.²⁸⁹ The following month Congreve was appointed to the new post of Commandant of the Royal Military Repository and Superintendent of Military Machines, and the newly established 'Repository Grounds' were given over 'solely for instruction in the management of heavy ordnance'.²⁹⁰ Repository exercises became compulsory for artillery officers and soldiers under a royal warrant issued on 19 December 1778, and on 24 December of that year General Williamson was ordered by the Board of Ordnance to build a Repository for Military Machines in the Warren (renamed the Royal Arsenal in 1805).²⁹¹

The Repository seems to have been built in 1779-81 and comprised a two-storey brick range, with guns and mortars on the ground floor – for instructing the artillery – and what were probably store rooms at first-floor level.²⁹² Attached to the south there was a training quadrangle enclosed by a wall; this featured a long 'Dry Excavation' to represent a river, for demonstrating the construction of pontoon rafts, bridges and temporary cranes. According to W. T. Vincent, the Repository staff included a modeller as well as a clerk, sergeant, corporal and two labourers, all of whom were overseen by Congreve as Superintendent.²⁹³

Congreve's new course of instruction in ordnance management quickly won praise from fellow artillery officers. William Grant, Captain of the Royal Regiment of Artillery at Woolwich, testified to the 'great advantages which the Regiment of Artillery may derive from the Repository' after watching his non-commissioned officers and men learn Congreve's exercises within one week.²⁹⁴ Major Benjamin of the Royal Artillery at Winchester reported in 1781 that during the past three years he had successfully used the new gun carriages, lighter ordnance and apparatus for hauling the guns over difficult ground. He stated his belief that Congreve's improvements and schedule of exercises were of 'great benefit to the Service', a view echoed by Lieutenant John Macleod, who wrote from Wilmington of the advantages gained from using the modified carriages and three-pounders in the 'woody unclear'd Country' of the North American campaign.²⁹⁵ A succession of similar testimonials convinced the Board of Ordnance to adopt fully the improved equipment developed by Congreve and to support his training exercises at the Repository. Thereafter, 'under Congreve's direction, the Repository was to evolve into an institution whose function belied its simple title; it became a living, active centre

of excellence, combining the disparate elements of training, research, and an embryo museum'.²⁹⁶

It is important to state that an equivalent training course for engineers was not established until 1812, when Sir Charles Pasley (1780-1861) set up the Royal Engineer Establishment in Chatham, Kent (later the School of Military Engineering) 'for the Instruction of the Corps of Royal Military Artificers, or Sappers and Miners, and the junior officers of Royal Engineers, in the duties of Sapping and Mining and other Military Field Works'.²⁹⁷ He wished to concentrate all training activities at Chatham, but in fact the Royal Sappers and Miners Training Depot continued at Woolwich until 1850; the Royal Engineers' headquarters also remained at Woolwich until 1857. The cadets of the Engineer Corps – together with those of the Artillery – continued to be educated at the Royal Military Academy until its closure in 1939.

In addition to the innovations which William Congreve made to artillery equipment and exercises, he also proved pioneering in establishing a historical collection, not only as an aid to teaching and to developing new ordnance, but also as a means of understanding the past. He conceived of forming 'as extensive a collection as possible of everything tending to improve the science and practice of artillery, and to explain its progress'.²⁹⁸ For a number of years prior to 1778, Congreve had been accumulating artefacts for display, which the King was so eager to see that he made a special visit to Woolwich on 11 May 1778, four days before he formally appointed him Commandant of the Repository.²⁹⁹ In the garrison orders given out on 24 December 1778, the Board of Ordnance instructed officers of the Artillery to 'deposit such of their manuscripts, drawings and models as they can spare, for which the Superintendent of Military Machines has orders to give a receipt and to have the donor's name inserted in a book, to secure the credit so justly due to every officer who appropriates his labours to the service of his country'.³⁰⁰ Donations quickly followed – including a model given by Master-General Townshend himself – and on 7 June 1779 the Board of Ordnance minuted that 'several curious pieces of artillery of particular forms lying about the Warren at Woolwich' were to be delivered to Congreve 'and lodged in the Repository of Military Machines'.³⁰¹ In 1781, that early champion of the Repository, James Pattison, donated 'a number of drawings and Artillery Tables of the late General Borgards', together with a number of models and instruments and 'a piece of a Column of Salt Petre' for making gunpowder.³⁰²

The historical collections were housed on the first floor of the Repository building in the Warren, but suffered considerable damage in a disastrous fire that broke out on 20 May 1802. About 160 of Congreve's original exhibits survived and were accommodated in Tower Place while a new museum was being constructed within the Repository Grounds. This wooden building was finished in 1806 and housed the historical collections until 1820, when they were transferred to the newly erected Rotunda. By this date, the Repository was under the supervision of Congreve's son, Sir William Congreve (1772-1828), who had succeeded to all of his father's appointments on the latter's death in 1814. While the younger Congreve appears to have been primarily responsible for the Rotunda's removal to Woolwich, it was the elder Congreve who created the institution – the Royal Military Repository – that determined the Rotunda's future existence.

The Re-erection of the Rotunda, 1818-20

There was considerable debate about the future of the Rotunda even after the Prince Regent had requested in August 1818 that it should be transferred to Woolwich. It is worth, however, examining the motives behind Sir William Congreve's desire to make use of the redundant Rotunda building. Firstly, of course, Congreve had been closely involved in the series of celebratory events marking the peace of 1814 and had masterminded the Grand National Jubilee on 1 August of that year (see p. 11). It was unsurprising, therefore, that the younger Congreve should have taken a keen interest in the future use of the grandest of the temporary structures created for these celebrations.

The military and royal associations of the 'Polygon Room' would have resonated with both Congreve and with Benjamin Bloomfield (1768-1846) – the Prince Regent's private secretary from 1817 to 1822 and principal confidant during these years, who was an artillery officer and had trained at Woolwich. Having succeeded his father in 1814 as Commandant of the Royal Military Repository and Superintendent of Military Machines, Congreve also wished to continue improving the facilities and collection of the Repository, and had a personal attachment to Woolwich – the area was sometime home to Congreve senior and junior. Both Congreve – though never a member of the Royal Artillery – and Bloomfield would thus have felt considerable loyalty towards Woolwich when making the case for the Rotunda to be transferred there. Woolwich was already closely associated with the Allied victory, not just because of the men and firepower deployed throughout the long campaign to defeat Napoleon, but also because of the ceremonial role it had played during the visit of the Allied Sovereigns in June 1814 (see p. 8). The contents of the Repository Museum – which included trophies from previous campaigns against the French, such as two enemy guns from the Battle of Malplaquet (1709) – had been inspected by the dignitaries during their tour of the Arsenal and Woolwich Common.

The original idea of re-using the Rotunda at the Repository was almost certainly prompted by the arrival at Woolwich in 1816 of Britain's share of the battle trophies from France. These spoils of war – which were shipped from Rouen in January 1816 – consisted of 'a large number of service equipment either captured at Waterloo or found in various depots and defence works round Paris', together with 'a very mixed assortment of some three hundred items, mostly pre-revolutionary firearms, swords and long-hafted weapons'.³⁰³ It was the Duke of Wellington who had stipulated that these trophies from his victory over Napoleon should go to the Repository, despite an attempt by the Tower of London to acquire the small arms for its own collection. There was, however, scant space for these artefacts when they arrived at Woolwich, for the museum room in the Repository was already full. Many of the items were stored in the old Academy Rooms in the Laboratory and Tower Place, but this was only a temporary solution: the Repository needed a new and much larger building to accommodate its latest acquisitions.

Fortunately, Congreve succeeded in his plan of co-opting the Rotunda for Repository use, despite the initial refusal of the Treasury, which believed that the costs to the Ordnance of dismantling and re-erecting the building could not be justified (see pp.

45-6).³⁰⁴ As we have seen, the views of the Prince Regent prevailed and the Treasury was compelled to agree to the transfer of the Rotunda, giving its authority for the expenditure on 29 October 1818. Even after the Rotunda had been re-erected in the Repository Grounds and the considerable costs (£210 10s. 4½d. for dismantling, £2,381 8s. 13¼d. for re-erection) incurred in the process had been defrayed, the Board of Ordnance remained sceptical as to the building's usefulness.³⁰⁵ On 15 May 1820, in a letter to R. H. Crewe of the Ordnance Office, Fitzroy Somerset reported that the Master General of the Ordnance – who since 1819 had been the Duke of Wellington – had expressed doubts that the Rotunda was the best place for 'the Models &c deposited at Woolwich', but nonetheless desired 'that the Building may be given to the Officer who has charge of the Models, and that he may be directed to place them in it'.³⁰⁶ Later, in June 1820, it was noted in Parliament that the Prince Regent's gift of the Rotunda to Woolwich had 'saved the expence of two store-rooms'.³⁰⁷

The dismantled materials of the Rotunda were conveyed to the Royal Military Repository on 14 November 1818, and were initially 'laid up in store'.³⁰⁸ On 7 December 1818, Sir William Congreve wrote to R. H. Crewe to ask that the Board of Ordnance instruct the Commanding Engineer at Woolwich – Lieutenant-Colonel John J. Jones – 'to make the necessary arrangements' for the building's 'erection on the brow of the Hill at the eastern boundary of the Repository Grounds, that spot being the most convenient as well as the most picturesque situation for it'.³⁰⁹ The position chosen for the Rotunda ensured that it occupied a prominent, eye-catching site overlooking the common; looking west from the parade ground in front of the Royal Artillery Barracks gave a view of the Rotunda beyond the mortar battery, firing range and Commandant's garden, backed by the woodland of the Repository Grounds. Originally, this vista was uninterrupted, though a slight intrusion came in the form of the single-storeyed observatory – built for the Royal Artillery Institute (later Institution) – which was sited to the east of the Rotunda in 1838-39 (Fig. 19, see Fig. 86 and p. 132).

The task of re-erecting the Rotunda was entrusted to the Royal Engineers, under the command of Lieutenant-Colonel John J. Jones. He soon came under pressure from Congreve to strengthen its structure for – as Jones reported to the Board of Ordnance – 'Sir William represents it to be the intention, that the building should become a permanent receptacle for models, &c, and to render it such, urges that the Walls should be run up by brick-work'.³¹⁰ In seeking the necessary authority from the Board to comply with Congreve's wishes, Jones declared it was his opinion 'that it is extremely desirable for the perfect security of the building in the exposed situation where it is about to be erected, that the walls should be of greater strength than in the sheltered spot where it originally stood'. He also volunteered the information that the Ordnance had one million bricks in store at Woolwich, some of which could be used for this purpose, at the extra cost of £180 18s. 0d. in labour and mortar.³¹¹ This alteration to the Rotunda's structure was approved by the Board on 21 April 1819 and Jones proceeded with the work, substituting the earlier boarded outer edging (see Fig. 13) for walls of brickwork, set with twelve openings (one doorway and eleven windows) (see Fig. 21).

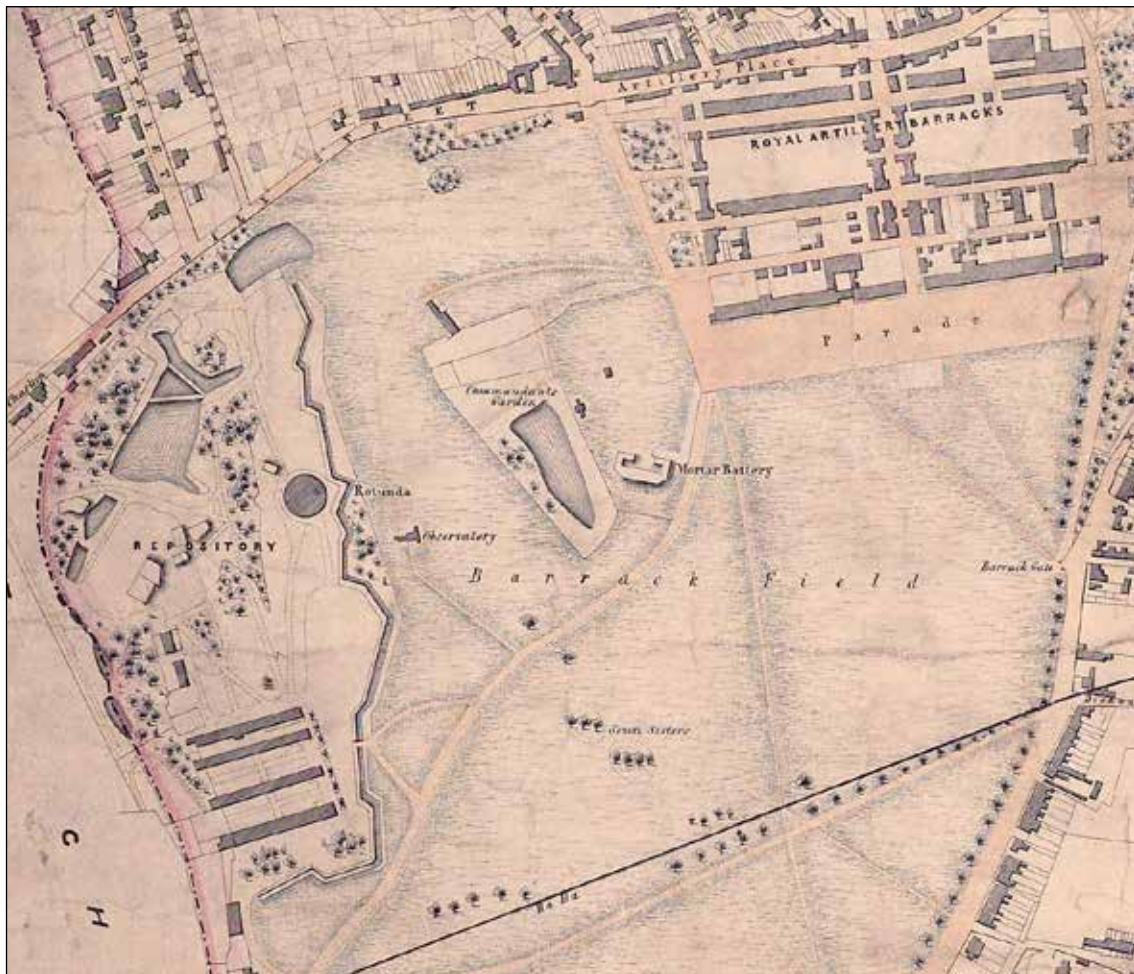


Fig. 19 Detail of a map of Woolwich District, January 1845, showing the Royal Military Repository and Rotunda (on the left), and the Royal Artillery Barracks (on the right). (London Metropolitan Archives, City of London SC/PM/MB/01/29/004, from the Metropolitan Maps Collection)

The Board, however, was deeply unhappy about the escalating costs of re-erecting the Rotunda, having laboured under the misapprehension that the total expense would not exceed £500, a figure that Congreve had in fact estimated for landscaping the Rotunda's immediate surroundings.³¹² Congreve defended the expenditure incurred in rebuilding the Rotunda by arguing that its future use as the Repository Museum would free up much-needed space in the old Academy Rooms in the Laboratory, 'which are present entirely occupied with the Models and Trophies destined for the Rotunda'.³¹³ His claim that an entirely new store room could not be built for less than £4,000 persuaded the Board of Ordnance to sanction the rising expenditure on the Rotunda which, according to Jones's estimate of 24 June 1819, amounted to £2,381 8s. 13¼d.³¹⁴ Certainly some of the original materials had not proved reusable; for example, 'dwarf' walls of brickwork were raised 'to receive the compartments of the flooring in lieu of the original joists, which are altogether decayed'.³¹⁵ Moreover, none of the original oil cloth outer covering of the roof remained and thus additional canvas had to be provided for this purpose. Jones continued to make savings by using a portion of patent canvas that was in store at the Arsenal and that the Board had intended to sell.³¹⁶ Likewise, he identified 'a

considerable quantity of deals and scantling of various dimensions in the store yard ... which is daily deteriorating in value', and suggested converting some of it 'into sufficient plank and rafters to render the roof of the building solid and permanent'.³¹⁷

The Rotunda gradually took shape over the summer of 1819 – the roof was covered and the floor laid – and by October of that year Jones was able to report to the Board that:

The Building is now in such an advanced state, that besides the interior furnishing, little remains to be executed, but painting and nailing on about one third of the canvas covering to the weather boarding of the roof, raising about half the masonry column to support the dome, and repairing and fixing in the window and door frames.³¹⁸

It is regrettable that no documents have been found so far that shed light on the decision to add a masonry column to support the roof, a choice which must have been made by the Board of Ordnance between July and October 1819 (Fig. 20, and see Fig. 54).³¹⁹ This large Doric column – made of sandstone – was later adorned with some of the Rotunda's finest treasures and a shield bearing a brief inscription about the history of the building. Concerns presumably arose about the stability of the structure as it was being re-erected, though the column may also have been intended to serve a commemorative function – in 1864, it was referred to as a 'memorial pillar', and was inscribed with names of notable artillerymen.³²⁰ Jones requested further funds to complete 'the Shell of the Rotunda' before the winter of 1819. The Board once again had no option but to agree to the extra expense, although it expressed its unhappiness at 'the very loose and unsatisfactory manner in which it [the expense] originated'.³²¹ It was agreed that the fitting up and painting of the interior would be delayed until 1820, and thus it was not until 4 May 1820 that Jones could finally report to the Board that the Rotunda had been re-erected and was 'in a state to be occupied'.³²² In the estimate of works for Woolwich for 1821 and 1822, additional funds totalling £191 were approved for the completion of the Rotunda, but it is not recorded how these final expenses were incurred.³²³

The earliest published description of the re-erected Rotunda in the existing military landscape is by the noted French naval engineer Charles Dupin in 1822:

In 1819, the building of a spacious rotunda, having the shape of a Chinese kiosk, was commenced on one of the hills above Woolwich, and near the great artillery barracks. The edifice contains a circular hall of about forty yards diameter, which is intended for the seat of the repository of models. It is near this rotunda that the extensive and fine exercising ground is situated, which is destined for the manoeuvres of the school of the repository.³²⁴

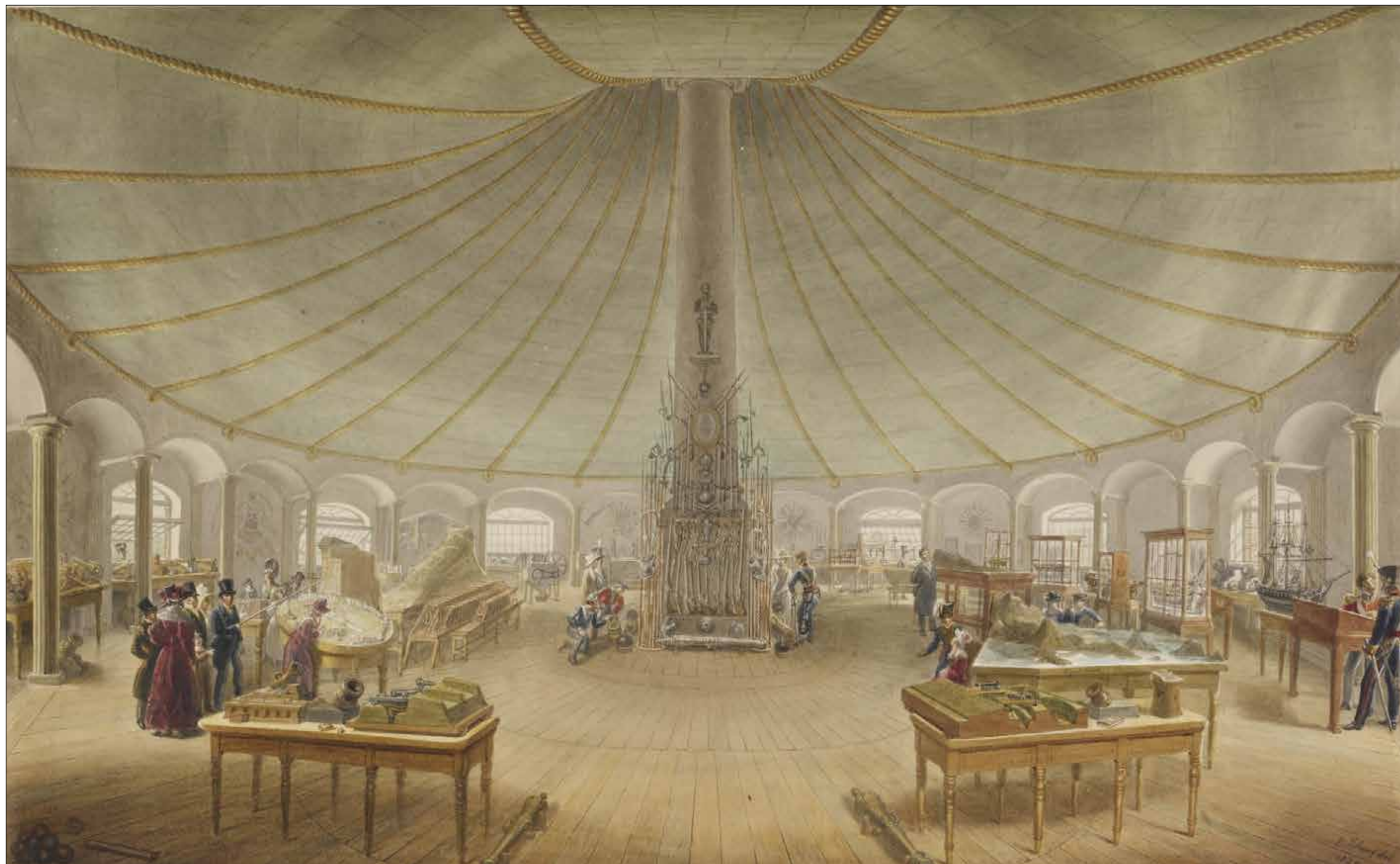


Fig. 20 Watercolour by George Scharf showing the interior of the Rotunda at the Royal Military Repository in 1828, with visitors examining the displays of models. The guide is pointing with a stick to Sir William Congreve's diorama showing St James's Park and Carlton House Gardens as prepared for the celebrations of 1814. The central column was added as part of the building's reconstruction in Woolwich in 1819-20. (© The Trustees of the British Museum)

The Dating of the Lead Roof

Perhaps the most elusive element in charting the reconstruction of the Rotunda has been the question of when the roof was covered in lead. Writing in 1963, Major J. P. Kaestlin – an under-secretary in the historical section of the Royal Artillery – took the view that the central pillar was erected ‘after the structure was reassembled and boarded over, to take the additional weight of a lead covering’; a similar sentiment was expressed by Brigadier Ken Timbers in 1994.³²⁵ There is, however, no mention of a lead covering in any of the statements provided by John J. Jones to the Board of Ordnance, and although lead is referred to in relation to the Rotunda in its incarnation at Carlton House, it was removed rather than added and almost certainly did not cover the roof (see p. 49).³²⁶

On 24 June 1819, an estimate was made for expenses relating to ‘covering the roof of the Rotunda with painted canvas in a complete manner, of making good and laying down the flooring, and of painting the woodwork’.³²⁷ Three years later, in 1822, a writer commented that the building’s ‘wall is of brick; and the covering is the same that had been formed for a similar building’, a somewhat confused reference to the Rotunda during its time at Carlton House.³²⁸ The decennial statements of lands and building in Ordnance ownership, which provide brief descriptions of the materials used in each building, provide further evidence of the roof structure in these years. For example, in 1821 the Rotunda was described as ‘A Polygonal building of 24 sides with a conical roof, the walls are of brick, the roof of boards covered with canvas – 115 feet diameter’.³²⁹ The same description was given in 1830 and in 1851, albeit in a more abbreviated form: ‘Rotunda (circular building) 113 diam. Brick, Wooden Roof Coved. Inside with paper and outside with Painted Canvas’; there is no description of the Rotunda in the 1841 statement.³³⁰ In addition, none of the newspaper and magazine articles about the Woolwich Rotunda in these years make any reference to a lead roof, although it has to be said that their remarks on the building’s structure are mostly confined to describing the interior.³³¹

There are various illustrations of the Rotunda’s exterior during these decades, including R. W. Lucas’s print of 1820, George Scharf’s watercolour of 1826 and John Grant’s 1844 view of Royal Artillery Repository exercises in 1844 (Figs 21-23). All three of these show the roof as being coloured grey and having ribs running from top to bottom; though none are conclusive regarding its material, Lucas’s print is notable in appearing to indicate a covering of canvas over horizontally arranged boards, clearly visible beneath (and known to have had ribs; see Figs 25-26). Early nineteenth-century line engravings – most pictorial and inexact in nature – are more difficult to interpret. However, those pre-dating c. 1860 appear to indicate the same roof form seen in Lucas’s view and described in decennial statements up to 1851 – that is, a cloth covering over boards, with timber ribs (Fig. 24, and see Fig. 86).³³² Certainly, none illustrate windows in the Rotunda’s roof, or the pattern of lead that later formed a distinctive feature of its exterior.

Possibly contradictory evidence is provided by the German architect Karl Friedrich Schinkel (1781-1841), who visited Woolwich on 5 June 1826. In his journal, he made two sketches of the Rotunda – an elevation and a section – and referred specifically to ‘Ropes tied fast to a central post, with metal sheets in between’.³³³ Schinkel’s meaning is not entirely clear; his reference has been taken to imply the presence of



Fig. 21 A colour-washed etching by R. W. Lucas of 'The Rotunda or New Model Room' on 1 June 1820, shortly after its move from Carlton House Gardens. It is the earliest known view of the building in its new location. (Royal Collection Trust/ © Her Majesty Queen Elizabeth II 2020)

lead, though he certainly seems to be referring to the interior of the Rotunda – he had just viewed the model collection – rather than its external roof. The ropes, of course, survive, fanning from the central column outwards on the canvas ceiling, and are roughly shown on the architect's sectional sketch. Possibly, Schinkel was describing ironwork or metal ties used to fix the ropes and canvas in place; alternatively, he may have mistaken the material of the canvas ceiling, assuming it was sheet metal, widely used, as has been shown, for tented structures in northern Europe – for example, the late eighteenth-century 'copper tents' or guard houses built in Sweden (see Fig. 9).

Some evidence newly discovered as part of the present study appears to settle the matter conclusively. In October 1857, the Royal Engineer Office at Woolwich stated that they were 'about to enter into contract for completing the covering of the Rotunda Roof, with Wetlerstedt's [*sic*] Patent Metal, and three-quarter inch Memel Fir under boarding'.³³⁴ Workmen were invited to tender, the deadline being 30 October. As shall be seen, this formed part of a wider programme of work initiated at the Rotunda at this time, continuing into the 1860s (see pp. 79-83). The reference appears to be to a material patented by the inventor Baron Charles Wetterstedt (d. 1853), who had been active in London since at least 1840. Wetterstedt had already worked closely with the armed forces at Woolwich, his patented 'metallic composition' being used as a covering for the hulls of ships. In 1841, it was stated that his 'Patent Anti-Corrosive Marine Metal' had through 'extensive experience' been proved to be of great use 'for every description of Roofing, Spouts, Cisterns, Gutters &c.', and had been utilised at buildings such as railway stations, the temporary Houses of Parliament and the Athenaeum in Manchester. The advert concluded that 'For *cheapness, durability, and lightness*, it is unrivalled, and the Patentee defies all competition'.³³⁵



Fig. 22 Watercolour of 1826 by George Scharf showing the Royal Artillery Repository Grounds at Woolwich, looking east, with the Rotunda in the middle distance. At this point, the roof covering seems to have been of canvas-covered wooden boarding, rather than lead. (© The Trustees of the British Museum)



Fig. 23 Hand-coloured aquatint showing Royal Artillery Repository Exercises and the memorial to Major General Sir Alexander Dickson adjacent to the Rotunda, engraved and published by John Grant in 1844. (© Yale Center for British Art, Paul Mellon Collection)

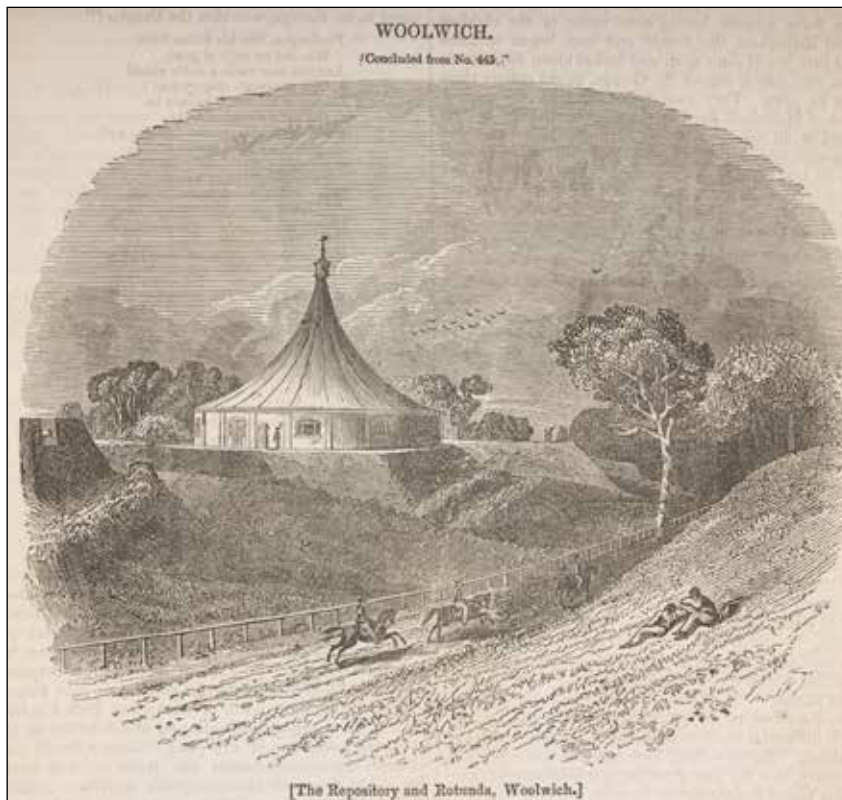


Fig. 24 View of the Repository and Rotunda, Woolwich, from *The Penny Magazine of the Society for the Diffusion of Useful Knowledge*, 1839. (The British Library Board, 6421.900000, 23 March 1839, p. 105)

In employing this metal at the Rotunda, therefore, the Royal Engineer was making use of a tried-and-tested material. However, work was either begun but not finished or postponed entirely, perhaps because the museum was not closed for renovations until Christmas 1861 (see p. 79).³³⁶ In May 1862, the Royal Engineer Office invited tenders for ‘works to be executed in Re-Covering the Roof, &c, of the Rotunda’, and in May the following year gave further details, requesting contractors to tender for ‘Completion of Re-covering with Lead, the Upper Portion of the Roof’ before 30 June.³³⁷ The Rotunda had reopened to the public by the Whitsuntide holidays of May 1864, so work must have been finished fairly fast.³³⁸ It is not known whether the material ultimately used on the Rotunda’s roof was Wetterstedt’s patent metal; as this seems to have been more akin to copper, the likelihood is that this was abandoned in favour of the lead which remains today. The completed roof was newly set with windows, as shall be discussed later in this report (see pp. 80-2).

It could of course be argued that the existing leadwork of the Rotunda’s roof was simply replaced in the phase of works of the 1850s and 1860s. However, taken altogether, the burden of evidence is overwhelmingly supportive of a roof covered in the manner described by John J. Jones in 1819 – that is, weather-boarded and then covered with painted canvas – until the laying of the lead roof in the mid-nineteenth century.³³⁹ This statement takes account of the evidence provided by visual sources: these seem to indicate a roof covering of cloth over boards until at least 1850, while in the later nineteenth century the windows and distinctive pattern of the new leadwork (with roll-joints, both vertical and horizontal) are clearly visible – for instance in an undated watercolour by George Bryant Campion (1796-1870), drawing master at the Royal Military Academy, and a photograph of around the 1860s (see Figs 31 and 33). Photographs taken by the Property Services Agency show that prior to the refurbishment of 1972-75 the Rotunda’s roof was clad with continuous timber boarding as a substrate for the lead sheet covering (Figs 25-27).³⁴⁰ From its form, and the chalk lettering which it bears, this appears to be the boarding that underlaid the painted canvas prior to the 1860s – as indicated in Lucas’s view of 1820 (see Fig. 21) – and probably dates to the Rotunda’s original re-erection in Woolwich.



Fig. 25 Photograph of October 1973 showing the exposed timber underlay of the roof of the Rotunda during ‘restoration’. The boarding probably dates from the building’s re-erection in Woolwich, 1819-20. (© Crown copyright. Historic England Archive, ref. p_g19692_010)



Fig. 26 Detail of the boarding exposed beneath the lead cladding, 9 October 1973. The boards are marked in chalk with the names of the workmen, including a carpenter and a plumber, probably employed during the Rotunda's re-erection in 1819-20. (© Crown copyright. Historic England Archive, ref. p_g19692_006)



Fig. 27 The internal framework of the roof of the Rotunda during restoration, 17 October 1972, with the nineteenth-century boarded outer covering visible above. (© Crown copyright. Historic England Archive, ref. p_g18526_007)

The Landscaping of the Repository Grounds

The artillery exercises that the elder Congreve devised in 1774 were first formally carried out in 1778, the year that the Royal Military Repository was founded (see pp. 52-3). In his letter of 17 June 1778 appointing Congreve to the new post of Commandant of the Royal Military Repository, the Master-General of the Ordnance stated that ‘the grounds attached to that institution are now solely used for instruction in the management of heavy ordnance, but when it was first opened, the sharp turns and steep inclines of the Repository Grounds were made use of in training the drivers to turn and manage their horses’.³⁴¹ From work carried out by Sarah Newsome (see p. 116), it would appear that this land first became available for artillery use after part of the Bowater Estate was leased in 1773.³⁴² In the same year, Nathaniel Pattison (brother of General James Pattison) ‘rendered to the Board a part of his Estate opposite to the south part of Woolwich Warren, for the Purpose of erecting Barracks’.³⁴³ Two years later, James Pattison suggested to the Board of Ordnance that he carry out some experiments using Congreve’s artillery exercises in another portion of his brother’s lands in Woolwich. He explained as follows:

in my Brother’s Sand Pitts near the Warren is a great variety of unequal broken ground, furnishing many different inclined plans, even to perpendicular ones, or precipices, as also some suitable ravines, or hollow ways, where we might have an opportunity of trying many Experiments, which I humbly conceive would be instructive both to Officers and Soldiers, and may in a future War prove advantageous to His Majesty’s Service.³⁴⁴

Although these lands do not seem to have related to the Repository Grounds – the Pattison estate was to the east of the common, while Pattison’s sandpits were in Plumstead parish, east of the Warren – these comments regarding landscape are of interest. Certainly, the natural topography of the Repository Grounds – which formed part of Hanging Wood, and seem formerly to have been part of the Bowater estate farm – provided the ideal terrain for such exercises, with its contours and woods. It is clear from map evidence that the various ponds and paths were in existence prior to the Rotunda’s reconstruction on the edge of the Repository Grounds (see Fig. 29 and Figs 73-75). According to work carried out by Sarah Newsome, the Repository ponds – and other features of the landscape – may have already been tailored to the training needs of cadets.³⁴⁵ There is an early reference to the ponds being used for military exercises in E. W. Brayley’s *The Beauties of England and Wales* (1808), in which he states that ‘on the west side of the Barracks is a piece of water, where experiments with gunboats, &c., are occasionally made’.³⁴⁶ The first buildings on the site were four long sheds used for storing guns and carriages, and a gatehouse or guard house (now 1 Repository Road) by the original entrance to the Repository Grounds in the south. Map evidence shows that the Repository Sheds were in place by 1803, while the gatehouse was built in 1806 (see Figs 74-75 and 80).³⁴⁷ These buildings were paid for out of the £80,000 granted by the Ordnance in 1802 and 1803 to fund the reconstruction of what had been lost in the fire at the Warren in 1802.³⁴⁸

At precisely the same time that the younger Congreve took possession of the dismantled Rotunda and asked for it to be reassembled in the Repository Grounds, he also requested that the surrounding land be remodelled into a series of revetments in order to create a specialised training landscape for the Artillery and Engineers to be instructed in field manoeuvres. In his letter to the Board of Ordnance of 7 December 1818, he specified the features that he would like the Engineers to create:

I beg at the same time to request, that the Commanding Engineer may also be desired to make the necessary arrangements for the formation of a Section of regular fortification, with Scarp and Counterscarp, Wet Ditch, Glacis and approaches in the Bottom of the Repository Ground, with such additions as may be found necessary to carry on a complete course of instructions in all that relates to the practice involved in the defence and attack of such a work, passing the Ditch, escalading etc.³⁴⁹

Congreve was confident that these features could be made out of 'Piste or rammed earth, instead of Brick', as he had demonstrated in an experiment recently carried out in the Repository. As a consequence, he believed that the cost of such earthworks would not exceed £500, for the principal expense would be the labour of the Engineer Corps. He added that having discussed his plans in detail with the Clerk of the Ordnance 'on the spot', he had persuaded him of the importance of creating these mock fortifications. Congreve concluded that this training landscape 'seems the only thing wanting to make this Establishment the most complete school of practical military instruction, that does exist – or, I believe I may venture to say, that can possibly be devised'.³⁵⁰ His arguments clearly convinced the Board of Ordnance, who approved the works two days later, on 9 December 1818.

Work does not appear to have started on the creation of these fortifications until early 1820, priority being given instead to re-erecting the Rotunda.³⁵¹ By the time that the Rotunda was handed over to Congreve in May 1820, however, the earthworks appear to have been started by the Engineers. Certainly, the earliest known illustration of the Rotunda in situ at Woolwich – a colour-washed etching by R. W. Lucas dated 1 June 1820 (see Fig. 21) – depicts the gun emplacements immediately to the east of the Rotunda, though these may have been formed out of the existing boundary (see p. 124). A map dated 1821, however, that was drawn to accompany John J. Jones's inventory of the Ordnance buildings at Woolwich, shows only a spur of wall bounding the Rotunda to the south (Fig. 28).³⁵²

In 1822, the French engineer Charles Dupin visited the Rotunda and the Repository Grounds, observing that:

The interior of this great park presents, among the features of the ground, varied combinations of slopes, which are extremely well calculated to afford the non-commissioned officers and soldiers of artillery every opportunity of practice in all the manoeuvres to which garrison or field-service can give rise. Within the enclosure have been constructed different fortifications and batteries, armed

with every description of ordnance, on field, garrison, and sea-coast carriages. In the most elevated parts of the park sheds have been built, under which a pretty large variety of models of ordnance have been collected. Advancing towards the bank of the Thames, you pass hills, vallies, a river, a lake, an island, &c. with narrow, difficult, crooked roads, crossing defiles and ravines. Thus this field of exercise seems to afford every local contingency which warfare usually produces. It would seem that no situation ought to embarrass artillerymen who had thoroughly gone over the manoeuvres of the practical school. On the esplanade in front of the barracks they are made to perform their evolutions with light field-pieces; on the proving ground they are taught to fire with precision; and lastly, in the interior of the ground of the repository, they are practised in the performance of manoeuvres of strength and exertion for every occasion which can arise.³⁵³

By 1830, when Jones carried out the next survey of Ordnance buildings, the full line of revetments and fortifications enclosing the Repository Grounds to the east and south was clearly marked.³⁵⁴ These earthworks followed the original boundary wall of the Repository Grounds, which was constructed during the first decade of the nineteenth century and was in place by 1813, according to a plan of that year (Fig. 29).³⁵⁵ Forming part of the area today known as the Napier Line, this important feature provided a practical, as well as dramatic, setting for the Rotunda and further established its permanence within the Woolwich landscape (Fig. 30).



Fig. 28 Detail of plan of the lands belonging to the Board of the Ordnance, dated 6 June 1821 and signed by Lieutenant Colonel John J. Jones, Commanding Royal Engineer at Woolwich. This detail shows (on the right) the Royal Artillery Barracks and (on the left) the Repository Grounds, with the Rotunda in the centre and the Repository Sheds to the south. (The National Archives, ref. MFQ 1/1274)

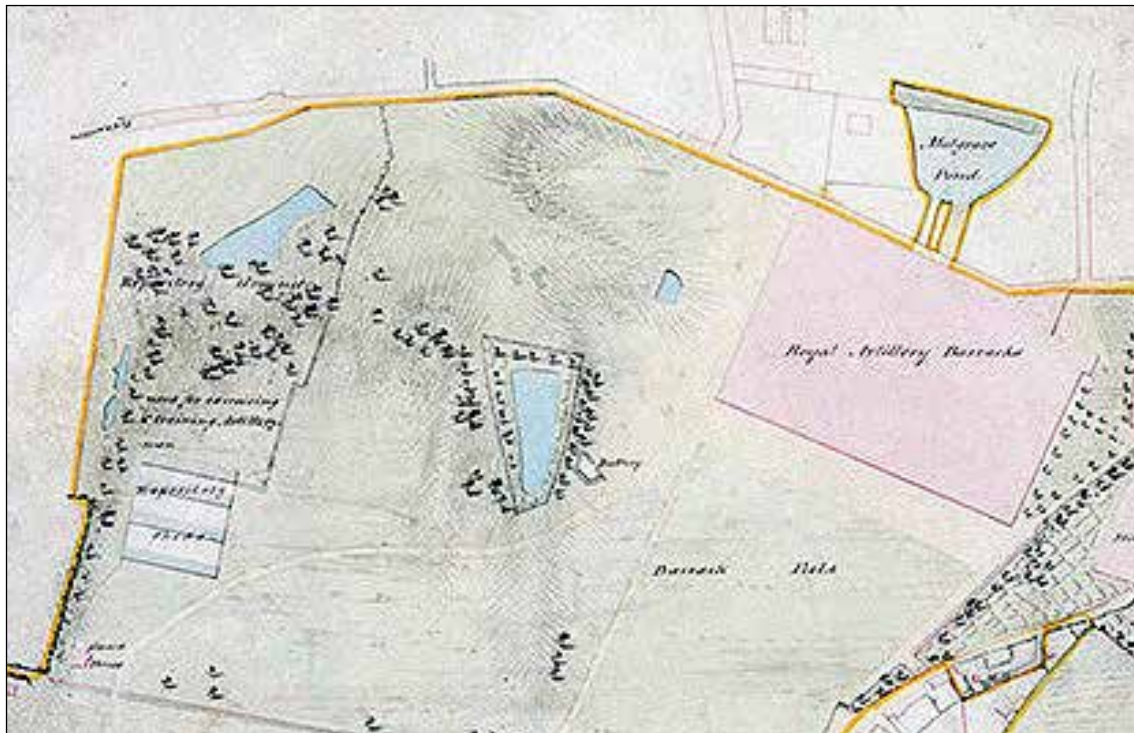


Fig. 29 Detail of plan of the Ordnance Lands at Woolwich, dated 17 June 1813 and signed Lieutenant Colonel Robert Pilkington. It shows, on the left, the Repository Grounds before the erection of the Rotunda. (The National Archives, ref. MPH 1/136)

The Evolution and Use of the Rotunda from 1820

1820-1859

When the Rotunda was handed over to Sir William Congreve in May 1820, the Board of Ordnance recommended ‘that the Occupation of the Rotunda may be completed as speedily as possible’.³⁵⁶ The earliest known illustration of the Rotunda – R. W. Lucas’s print, published on 1 June 1820 – shows the Rotunda literally open for business, with its door thrown open to entice in the visitors strolling along the path leading up from the Repository Woods (see Fig. 21). The interior of the Rotunda took a form that seems to have remained unchanged until the 1850s or 1860s (see Fig. 20). With the principal exception of the sandstone central column (see p. 58), the interior closely replicated its appearance in its previous incarnation at Carlton House: gilded cords – which seem to have been the originals – radiated from the top of the column to the circumference of the tent-like roof, whose inner canvas appears to have been painted in a light and reflective white or cream colour. In its new usage, the Rotunda no longer needed so many doorways (compare Figs 13 and 21), and all but one were converted into windows; the remaining doorway was on the south side of the building. Outside the Rotunda, aside from the surrounding training landscape, there was only one significant addition to the immediate surroundings during these years – this was Sir Francis Chantrey’s granite memorial to Major-General Sir Alexander Dickson (1777-1840), Wellington’s right-hand man during the Peninsular Campaign, erected almost due south of the Rotunda in 1844 or 1845 (Fig. 31 and see Fig. 23).³⁵⁷

In the introduction to the first catalogue of the Rotunda, published in 1822, Congreve set out the aims of the Royal Military Repository:

The object of it was to provide practical instruction for the Officers, Non-commissioned Officers, and Men of the Regiment of Artillery, both on the great scale and with the aid of Drawings and Models; and for this purpose to form as extensive a collection as possible of everything tending to improve the science and practice of Artillery, and to explain its progress.³⁵⁸

As J. P. Kaestlin has observed, Congreve was anxious to stress the educational purpose of the Rotunda – as originally envisaged by his father – rather than to present it as a ‘mere museum of curiosities’.³⁵⁹ He produced a printed syllabus of the Repository course, and the different exercises were illustrated in over a hundred coloured drawings for officers to study in tandem with the practical training. The practical function of the Repository is apparent in a coloured sketch drawn ‘by aid of the Pocket Sextant’ by C. Stratford of the Royal Military Academy (Fig. 32). The sketch, which is undated but must have been executed between 1845 and 1861, delineates the whole of the Repository Grounds, with its contours, ponds, sheds, gun emplacements and, of course, the Rotunda.



Fig. 31 Watercolour of c. 1865 showing the Rotunda from the south-east, the training fortification and Francis Chantrey's monument to Major-General Sir Alexander Dickson. The painting is the work of George Bryant Campion, Drawing Master of the Royal Military Academy, Woolwich. It shows the Rotunda with its new lead roof and roof windows, installed in the early 1860s. (Courtesy of the Royal Artillery Museum)

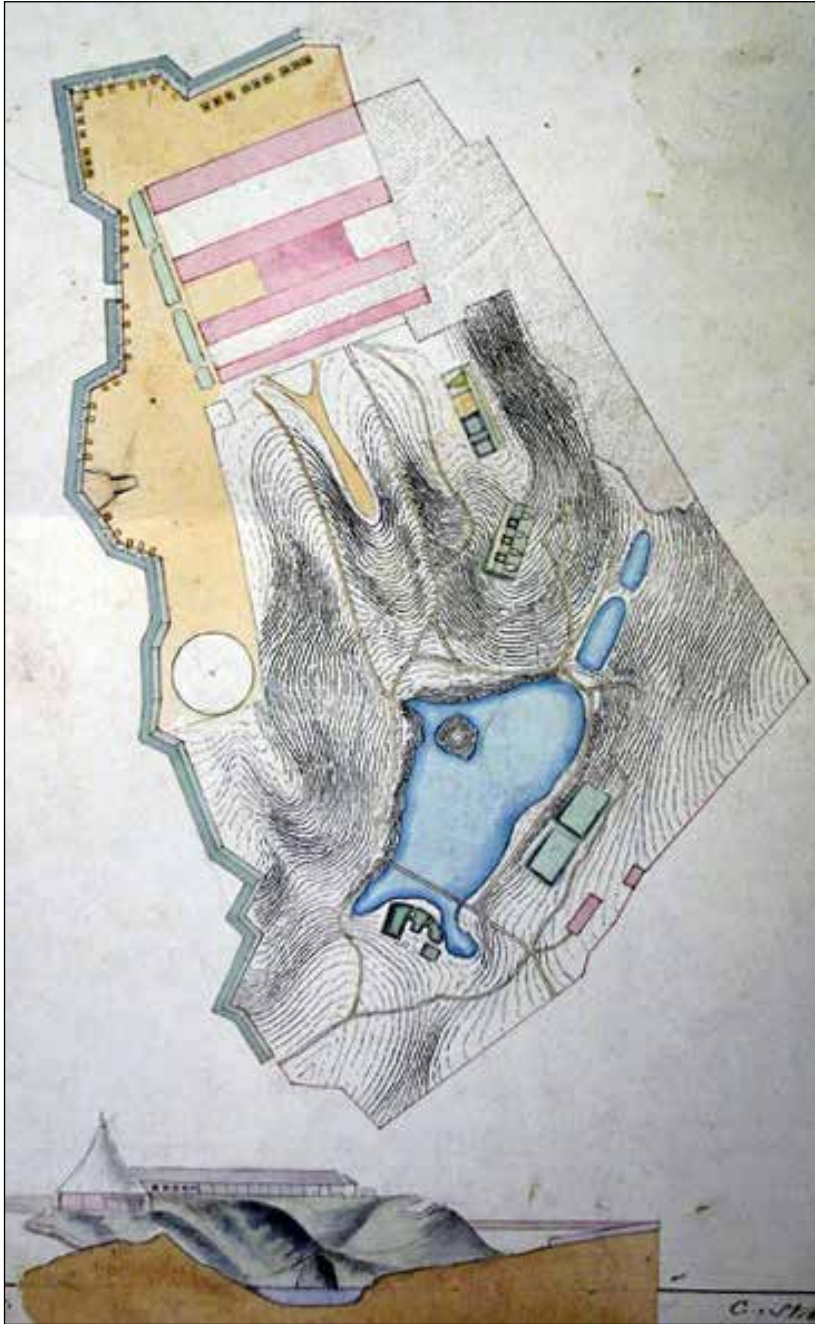


Fig. 32 Sketch of the Royal Military Repository produced 'by aid of the Pocket Sextant' by C. Stratford of the Royal Military Academy, c. 1845-61, showing the Rotunda at the centre left. North is at the bottom of the sheet. (Historic England)

Repository exercises (see Fig. 23) continued to be taught in this location until at least the end of the 1850s, and in 1858 the Artillery turned to the new medium of photography to record these activities. The pioneering photographer John Spiller (1833-1921) was working as a chemist in the Arsenal when he was commissioned to produce an album of photographs to illustrate 'the successive operations gone through in working heavy ordnance' as an aid to instruction at the Royal Military Repository.³⁶⁰ The contemporary account of Spiller's highly detailed photographs noted that 'many of them have the advantage of a picturesque back-ground of fine foliage, which, combined with water, has in no small degree contributed to the general effect', which leads one to conclude that these photographs were taken of exercises carried out in the Repository Grounds.³⁶¹ Two albums of photographs held

in the collections of the Royal Artillery Museum appear to contain Spiller's images, some of which are signed, whilst another group of images are not attributed to Spiller but seem to show the steps involved in the Repository exercises; they provide fascinating evidence of the continued usage of the Repository for its original purpose (Fig. 33, and see Figs 78-79 and 82-83).



Fig. 33 A photograph of around the mid- to late 1860s showing cadets practising drill in the southernmost of the two bastions in the Royal Military Repository. The Rotunda is visible in the background, with its new lead roof completed in 1862-3. (Courtesy of the Royal Artillery Historical Trust, ref. AL44/90)

Congreve himself played little part in the day-to-day tuition and concentrated instead on his curatorial role at the Rotunda and his scientific researches at the Laboratory. He certainly brought together as many artefacts as he could amass to display in the Rotunda, adding to the existing collection over a hundred of his own models – including his model (now seemingly lost) of St James's Park and Carlton House Gardens during the 1814 celebrations, which showed the Rotunda in its original position – together with his celebrated rockets and an ingenious time-piece made for the Prince Regent. Congreve also attracted a number of significant donations, most notably from his patron the Prince, who on his accession to the throne in 1820 gave him George III's collection of large topographical models of fortifications and dockyards. One especially notable exhibit was Napoleon's funeral car, on display in the museum from the 1820s until it was gifted to Paris in 1858. George Scharf's watercolour illustration of the interior of the Rotunda, which dates from 1828, depicts many of these objects in great detail (see Fig. 20). The large models are displayed on tables – identifiable are Congreve's diorama of St James's Park and the model of Gibraltar from George III's collection – while the smaller items are exhibited in elegant glass cabinets and an impressive array of arms and armour decorate the central column.³⁶² Another view of the interior of the building, based on that by Scharf, probably dates from the 1830s and shows that the arrangement of the exhibits changed over time.³⁶³

Outside the Rotunda were distributed 'Ancient and Modern Pieces of Ordnance, Carriages, and other Military Machines, on the large scale', among which were the two French guns from the Battle of Malplaquet (1709) and the gun that exploded in casting at the Moorfields foundry, causing the 1716 explosion (see p. 50). A total of 1,280 items were listed in Congreve's 1822 work, but this may not have included the whole Repository collection, as later curators discovered significant omissions from Sir William's original catalogue.³⁶⁴

The Rotunda was opened to the public as soon as it was fitted out with its exhibits in mid-1820; visitors were admitted daily from 9am until 12pm, and again from 2pm until 5.30pm.³⁶⁵ A typical visitor experience was described in 1844, and this will be set out in full:

Visitors, on entering the gate, turn to the right, and the sentinel will point out a range of buildings on the left, into the second door of which they must enter, and the bombardier on duty for the day will insert their names in a book devoted to that purpose. The Rotunda, being the most prominent object, strangers generally proceed to it, without waiting to examine the numerous pieces of ancient and modern ordnance arranged on the ground. The building has a singular and picturesque appearance, being erected on the extremity of the high ground, with a precipitous descent at the north side, beautifully wooded and interspersed with water; and in the distance is an excellent view of the west end of Woolwich and the extensive flat lands on the Essex side of the river ... The building is twenty-four-sided, and one hundred and twenty feet in diameter, presenting a grand vista and uninterrupted view from whatever part of the interior visitors may be stationed, with the exception of a slender pillar to support the roof, but which has been so tastefully fitted up with piles of rare and ancient guns, shields, and helmets, and on which the light from eleven spacious windows and a glass door, at the only entrance on the south side, makes this support appear rather as an ornament and a relief to the eye, than an indispensable appendage to the building.³⁶⁶

Apparently, no foreigners were then allowed to enter any of the military departments at Woolwich without a written order from the Master-General of the Ordnance.³⁶⁷

The younger Congreve died in 1828, and was succeeded as Superintendent of the Royal Military Repository firstly by Colonel J. S. Williamson (d. 1836) and then by Colonel Thomas Paterson (1780-1856). Williamson carried out an audit of the contents in 1829, which uncovered several inaccuracies in Congreve's catalogue of 1822, and took delivery of some valuable new acquisitions – notably the two Seringapatam guns donated by George IV in 1829 and a set of models of Russian artillery given by Tsar Alexander I to Wellington in 1815 and presented to the Repository in 1834. During Paterson's twenty years in charge (1836-56), the Rotunda continued to accumulate exhibits, including recent inventions such as Hale's spinning rocket and historic artefacts such as some from the Tower of London, which

survived a devastating fire in 1841. *The Penny Cyclopaedia* of 1843 stated that, 'The centre of the cone which forms the top of the building is supported by a pillar, round which are arranged specimens of old English weapons, such as matchlocks, wheellocks, bills, partizans, old swords, &c. In other parts of the building are cannon, howitzers, models of fortified places, Indian arms, and a variety of other military and naval curiosities'.³⁶⁸ The catalogue was revised in 1851, showing that the number of objects had increased to 1,870, but for some reason was not issued.³⁶⁹ It has been suggested by Kaestlin that – in contrast to Congreve – Williamson and Paterson, as serving officers of the Royal Artillery, 'were chiefly concerned with devising new courses and hence with outside activities', which underlines the fact that the Repository was as much a training institution as a museum during this period.³⁷⁰

There is no doubt that during the years 1820 to 1859 the Repository was used exactly as intended by the elder Congreve – both the Rotunda and the designed military landscape surrounding it were fully utilised by the Artillery, as is clear from numerous contemporary views and accounts (see Fig. 23 and pp. 128-130). A typical description of this 'curiously shaped building, in the form of a huge tent' was provided in an article published in the *Saturday Magazine* in December 1838:

[The] Rotunda or Repository ... contains numerous items of curiosity and interest relating to the defence of the kingdom. The space surrounding the building is tastefully laid out in gravel walks and parterres, and contains within its enclosure, all the requisites for the instruction of the artillery in the practice of their formidable mode of warfare. Here are model rooms containing drawings and models of implements of war, workshops in which experiments are made and new models constructed, and in the open air different kinds of fortifications are erected by the students, and all the details of the management of artillery are put in practice for the purpose of instruction, near an artificial fortification constructed of earth. On the left hand as you enter the grounds, the method of loading and firing the larger kind of ordnance, used in fortified places, is taught with all the attention to minutiae which would be practised in the case of a siege ...

Round the entrance to the building many curious specimens of brass ordnance are seen; among them, two with three barrels each captured at the battle of Malplaquet, a village in the north of France.³⁷¹

In 1844, *The Visitor's Guide to the Sights of London* described the use of the Royal Military Repository as follows: 'The appearance presented on a near approach to the grounds of the Repository is that of a regularly constructed fort, with guns placed in the embrasures. The gunners and drivers of the Royal Artillery practice the art of defending fortifications, slinging guns or gyny, throwing pontoons, or floating bridges, across a small lake to an island in the centre, and various other duties connected with their branch of the service in this department'.³⁷² Such activities are depicted in Scharf's watercolour view of the Repository Grounds, dated 1826, which

shows men using a crane to manoeuvre a cannon (see Fig. 22). The training manuals of the day clearly demonstrate how the elder Congreve's series of ordnance exercises continued to shape the theoretical and practical instruction given to artillery officers. The Rotunda and Repository Grounds were also viewed by a much wider variety of visitors, however, including royalty from Britain and abroad, military leaders, courtiers and members of the aristocracy (see p. 133 and pp. 137-8).

1859 -1870

The eleven years between 1859 and 1870 saw the most intense period of change for the Rotunda – both in terms of its physical appearance and in terms of its purpose and contents – since its removal from Carlton House. The catalyst for these changes was the abolition of the Board of Ordnance in 1855, when responsibility for the Royal Artillery and the Royal Engineers passed to the War Office, and the transfer in late 1859 of the Rotunda and its contents from the direct control of the War Office to that of the Ordnance Select Committee.³⁷³ The latter change was made because the Royal Military Repository was no longer in use as a training school for the Artillery, a school of gunnery having been established at Shoeburyness in Essex earlier in 1859. Although Woolwich Common and the Repository Grounds continued to be used by the Royal Artillery for training and drill, their practical value to the corps was declining. For example, the firing ranges were gradually supplanted by the facilities at Shoeburyness from 1863 onwards, howitzer practice having ended on the common in 1855. Mortar practice from the Greenhill Battery, to the east of the Rotunda, continued until 1873, and the Repository ponds were still occasionally being used for exercises in the 1880s, but the bulk of such activities were transferred to the greatly enlarged Royal Arsenal at Woolwich and to Shoeburyness during the 1850s and 1860s.³⁷⁴ The headquarters of the Royal Engineers finally moved from Woolwich to its new station at Chatham in 1857.

While these developments marked the end of the Rotunda's formal role as part of a training complex, they ushered in the most dynamic champion of the Rotunda since the younger Congreve in the person of General Sir John Henry Lefroy (1817-90), who served as Secretary (1859-64) then President (1864-68) of the Ordnance Select Committee, and finally as Director-General of the Ordnance (1868-70). Lefroy – who had trained at the Royal Military Academy, Woolwich, and had served as an officer in the Royal Artillery since 1834 – had been the prime mover behind the far-reaching reform of military education that had resulted in the creation of the school of gunnery at Shoeburyness.³⁷⁵ As one of the founders of the Royal Artillery Institution (1837), he combined his commitment to the scientific improvement of artillery with a sincere concern to preserve and understand historic weaponry, especially at a time of rapid technological change which witnessed 'the transition from the old cast-iron or bronze muzzle-loading smooth-bore cannon firing spherical shot or shell to built-up rifled breech-loaders (RBL) rotating cylindrical stabilized projectiles'.³⁷⁶ Lefroy's far-sighted approach made him an ideal guardian of the Rotunda Museum at a time when its future looked uncertain, for he was able to see that it had a new role to play 'both as reference museum and depository for models of projects'.³⁷⁷

It was during the early years of Lefroy's leadership that an important phase of structural change was initiated at the Rotunda. These consisted of the addition of the lead roof covering, a one-storey rear extension to the rear (north) of the building, together with a boiler room, and windows in the roof. In part, Lefroy seems to have inherited these works. As has been noted (see p. 61), in October 1857 – following transfer to the War Office and the death of Colonel Paterson, and in the run up to further organisational changes at Woolwich – the Royal Engineer Office sought tenders for 'completing the covering of the Rotunda Roof, with Wetlerstedt's [sic] Patent Metal, and three-quarter inch Memel Fir under boarding'.³⁷⁸ This work may have been begun in 1856, and was possibly initiated due to urgent maintenance issues with the building's roof – seemingly, at this point, to have still been of canvas-covered timber boarding, as completed in 1820 and as described in a decennial statement of 1851.³⁷⁹

In February 1861, a plan, section and elevation were drawn up by the Royal Engineer Office, showing a proposed new single-storey extension on the north side of the Rotunda – complete with chimney – which was to be used to exhibit the small arms collection (Fig. 34). In July the same year, the press announced that 'By order of the War Department, the Rotunda ... is to be considerably enlarged and improved, for the purpose of receiving war trophies and other objects of interest'.³⁸⁰ The museum was closed to the public after Christmas 1861, and work presumably began on temporarily clearing the building of its exhibits.³⁸¹ In May 1862, a notice sought tenders for intended works 'in Re-Covering the Roof, &c, of the Rotunda'.³⁸² This work may have been initiated but not immediately completed, for in May 1863 a notice requested tenders for completion of 'Re-covering with Lead, the Upper

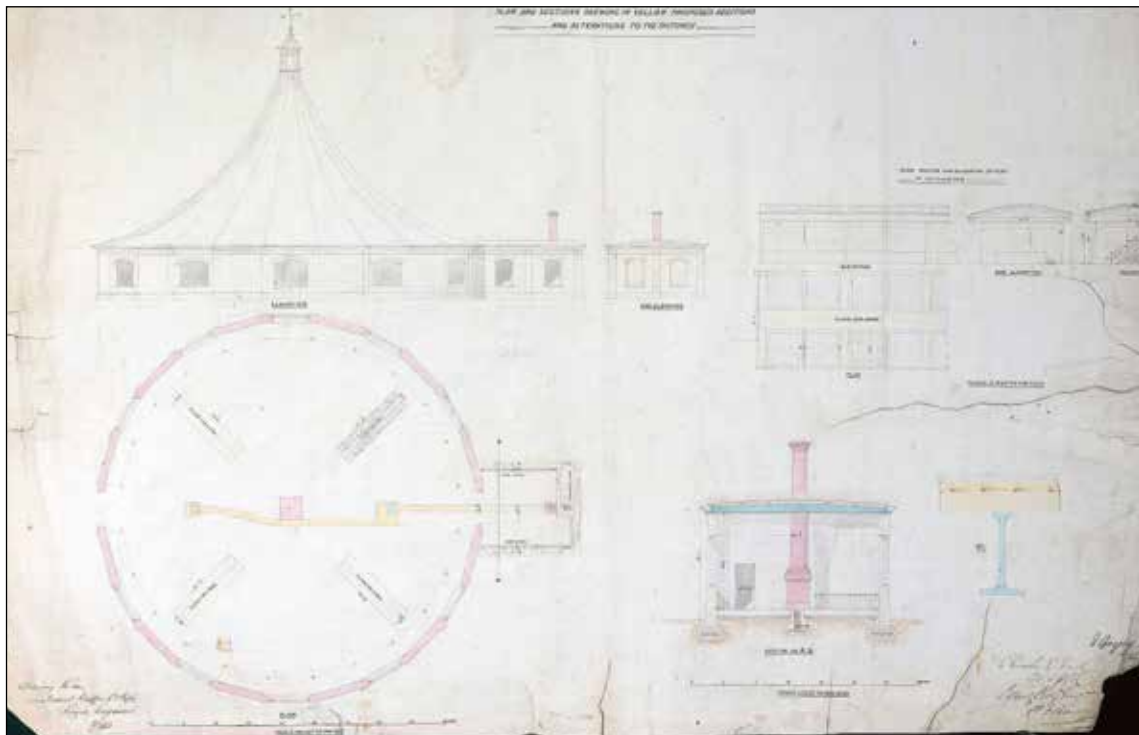


Fig. 34 Design of 3 February 1861 illustrating various proposed alterations to the Rotunda, including the single-storey north extension, built shortly afterwards. (The National Archives, ref. WORK 43/577)

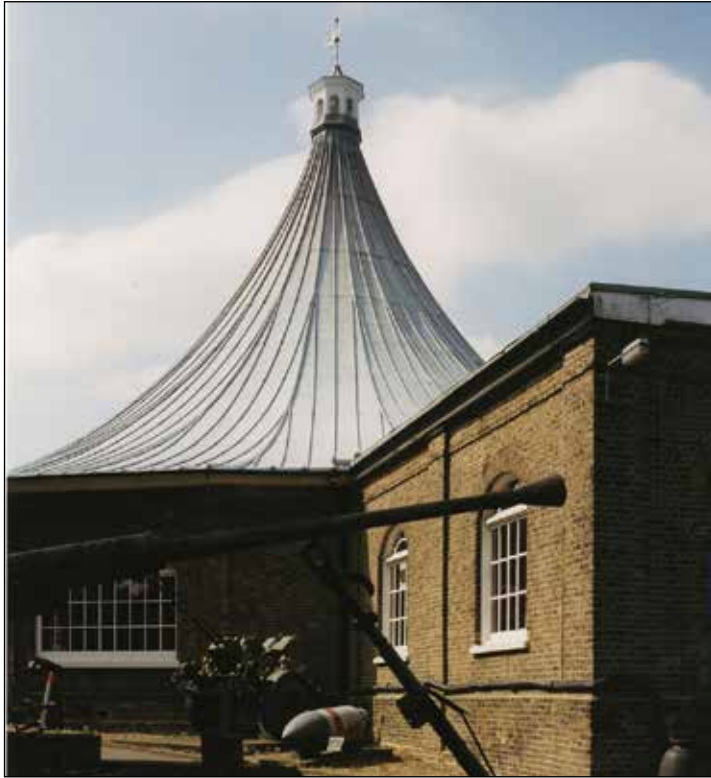


Fig. 35 The Rotunda seen from the north-east in 2004, showing the single-storey north extension, built in the early 1860s. (© Historic England Archive, ref. aa048106)



Fig. 36 The lead roof of the Rotunda, almost certainly dating from works undertaken in 1862-3. Four roof lights were inserted at this time. The roof was reclad and the windows removed in 1973-74, soon after this photograph was taken on 17 October 1972. Traces of the wartime camouflage paint are still visible. (© Crown copyright. Historic England Archive, ref. p_g18526_013)



Fig. 37 Aerial photograph of the Rotunda, 2 September 1994. Work dating from the early 1860s includes the lead roof (repaired in the 1970s, when the windows were removed) and the north extension, visible at the bottom of the picture. (© Crown copyright. Historic England Archive, ref. nmr_15157_52)

Portion of the Roof of the Rotunda', along with 'Renewing Ceiling' of the structure, 'Building a Boiler House, and fitting Hot Water Apparatus' to it, and 'Furnishing sundry Fittings' to the same.³⁸³ Reflecting this programme of work, the Ordnance Select Committee papers for 1861-62 contain an estimate of £712 for 'Rotunda – Alterations to fittings'.³⁸⁴ It would appear that a new heating system (and surely the roof and ceiling) were in place by December 1863, when the Committee sanctioned the weekly purchase of twenty-four bushels of coal to heat the Rotunda in the winter months.³⁸⁵ The museum seems to have reopened to the public by, at the latest, May 1864, when it and other buildings in Woolwich attracted crowds during the Whitsuntide holidays.³⁸⁶

The new roof was of lead, and almost certainly not the Wetterstedt Patent Metal mentioned in 1857 (Figs 35-37, and see Fig. 52). For one thing, the latter appears to have been a form of copper rather than lead, and for another, each sheet of the material is known to have been stamped with Baron Wetterstedt's name.³⁸⁷ No evidence of this has been found at the Rotunda, even though the dating of the lead roof has attracted interest since well before the time of the PSA renovation in the 1970s. Seemingly, Wetterstedt's metal proved unsuitable for some reason – perhaps lead was felt to be the safer option, and more durable. The Rotunda's roof was newly inset with windows at this time, provided with the aim of making the building a more attractive and effective museum – for, according to W. T. Vincent, the dimness of the interior was deterring visitors. He wrote that, 'The darkness of the room and the inadequacy of the catalogue rendered the museum of little value, till by the addition of windows in the roof and a careful revision of the catalogues in 1863-4 ...

the whole aspect of the place has been changed and its usefulness fully developed'.³⁸⁸ Further investigation of the Ordnance Select Committee minutes and War Office papers for the years 1856 to 1867 may well uncover concrete evidence of payments for these alterations, which are shown as complete in the plans of the Royal Military Repository as surveyed in 1867, with the boiler house extension visible (see Fig. 30).³⁸⁹ The finished profile of the Rotunda's roof can be seen in visual sources such as G. B. Campion's watercolour and a photograph of cadets practising drill, both of which seem to date to around the 1860s (see Figs 31 and 33).

Meanwhile, the Rotunda's collections continued to spill over into the grounds outside. In 1868, *Chambers's Journal* described a typical experience of the site: 'Upon first entering the grounds outside the Rotunda, the visitor will see a collection of iron plates smashed and broken up in various ways. These are examples of the effect of various kinds of shot and shells upon armour-plates, with which experiments were carried on at Shoeburyness. On the opposite side of the enclosure are varieties of ancient guns, dating back to the very earliest constructions'.³⁹⁰ By this point, these items seem to have been viewed primarily as part of the museum's overall collections, though they may formerly have played a part in training. The division of the Rotunda from the wider military landscape – especially the Repository Grounds – is indicated by the piece in *Chambers's Journal*, which states: 'The Rotunda stands in some beautiful grounds, which are, however, private, as they are for the use of officers of the regiments stationed at Woolwich, and are kept up at their expense'.³⁹¹

In the introduction to his fully revised *Official Catalogue of the Museum of Artillery in the Rotunda* (1864), General Lefroy summed up what he regarded as the purpose of the Rotunda: 'To some extent it is in fact a museum of the future, aiming to preserve for another generation of artillerymen much that would be otherwise swept aside by the tide of change'.³⁹² To make the collections relevant and interesting to the next generation, Lefroy not only oversaw refurbishment of the building housing them, but also extended the scope of the museum with a view to chronicling the history of artillery development, both in Britain and abroad. He successfully persuaded the Ordnance Select Committee to devote funds to increasing the collection, as he gratefully acknowledged in print: 'the liberality of the Government has permitted several purchases of arms and models, as well as the deposition of a great variety of objects which have already passed out of the service, or are in danger of doing so at an early date, in presence of the revolution which artillery and fire-arms are now undergoing'.³⁹³ One such purchase was made in November 1861 from the Royal Carriage Department and Royal Gun Factories – two models of Armstrong's 100-pounder cannons with different breech-loading arrangements, together with a traversing platform and garrison sliding carriage, were acquired, at the cost of £100.³⁹⁴ Such models demonstrated recent technological innovations in ordnance design and manufacture, and their acquisition demonstrated Lefroy's desire to keep the Rotunda's collection up-to-date.

Lefroy always had in mind the interests of the Rotunda Museum, and had used the opportunity of being sent to the Crimea in autumn 1855 – to inspect the hospital provision and staffing – to negotiate the acquisition of items such as the great bronze cannon of Mohammed II, cast in 1464, which finally made its way to Woolwich in 1866. In 1861 – in his more formal capacity – Lefroy proposed an 'interchange

of objects between the Royal Military Repository and the Tower'.³⁹⁵ The Rotunda's collection of small arms certainly increased during this period, for the new annex at the rear of the building was entirely given over to the display of such weapons. Under Lefroy's dynamic leadership, the Rotunda's collections grew to over 4,500 items, making it a museum of much wider interest to the visiting public and of greater educational use to the Artillery at Woolwich.³⁹⁶ He also worked with J. Hewitt of the Tower Armouries, R. R. Holmes of the British Museum and other experts in the field to produce a much more accurate and authoritative catalogue in 1864. Visitor numbers certainly increased during these years, annual attendance exceeding 48,000 during the 1860s.³⁹⁷

1870-1972

Lefroy resigned his post as Director-General of the Ordnance in early 1870, retiring from the Army in April of that year. In May 1870, the Rotunda was transferred to the care of the Royal Artillery Institution by General Sir John Miller Adye (1819-1900), Director of Artillery and Stores. While it made sense for the museum to fall under the direct control of the Secretary of the Royal Artillery Institution, the Rotunda was something of an anomaly, for it never became part of the Institution itself. In handing over responsibility for the building and its contents, the Secretary of State for War reassured the Royal Artillery Committee that he did 'not wish the Institution put to any expense in regard to the Rotunda' and undertook to reimburse any expenses so incurred. No curator was appointed; instead a clerk was paid a shilling a day to supervise the collection and visitors.³⁹⁸ In fact, these changes made little immediate difference to the functioning of the Rotunda and its collections continued to expand, as a result both of the generosity of serving and former artillerymen, who donated pieces from the Zulu and Boer Wars, and of the Arsenal's practice of depositing prototypes and obsolete equipment in the museum.

By the turn of the twentieth century, the building was being comparatively well cared for. Ernest R. Suffling reported how 'The curator and his two assistants, all military men, are indefatigable in explaining to visitors the uses and capabilities of the hundreds of items with which the museum is crammed. As a military museum it is in no way inferior in interest to either the collection at the Tower of London or that in the United Service Museum in Whitehall'. The grounds around the Rotunda continued to be strewn with 'many interesting objects ... Guns, mortars, bombards, howitzers, shells, armour-plates, and strange weapons of all countries lie around everywhere' (Fig. 38).³⁹⁹ The catalogue was revised again in 1906 – by Colonel H. W. L. Hime, a former Secretary of the Royal Artillery Institution – and the Rotunda Museum remained a popular attraction during the years 1870 to 1914 (Fig. 39).

The fortunes of the Rotunda declined dramatically in the inter-war years. Having survived the inevitable moth-balling during the First World War relatively unscathed, the museum's collections were suddenly (and controversially) decimated in May 1927. A new Secretary of the Royal Artillery Institution, Brigadier-General Evans, had decided that the collections of the Rotunda and the Royal Artillery Museum required rationalisation; according to Brigadier Ken Timbers, he 'succeeded in giving away virtually everything which was not directly connected with the business of artillery, much of it to local museums in the London area'.⁴⁰⁰

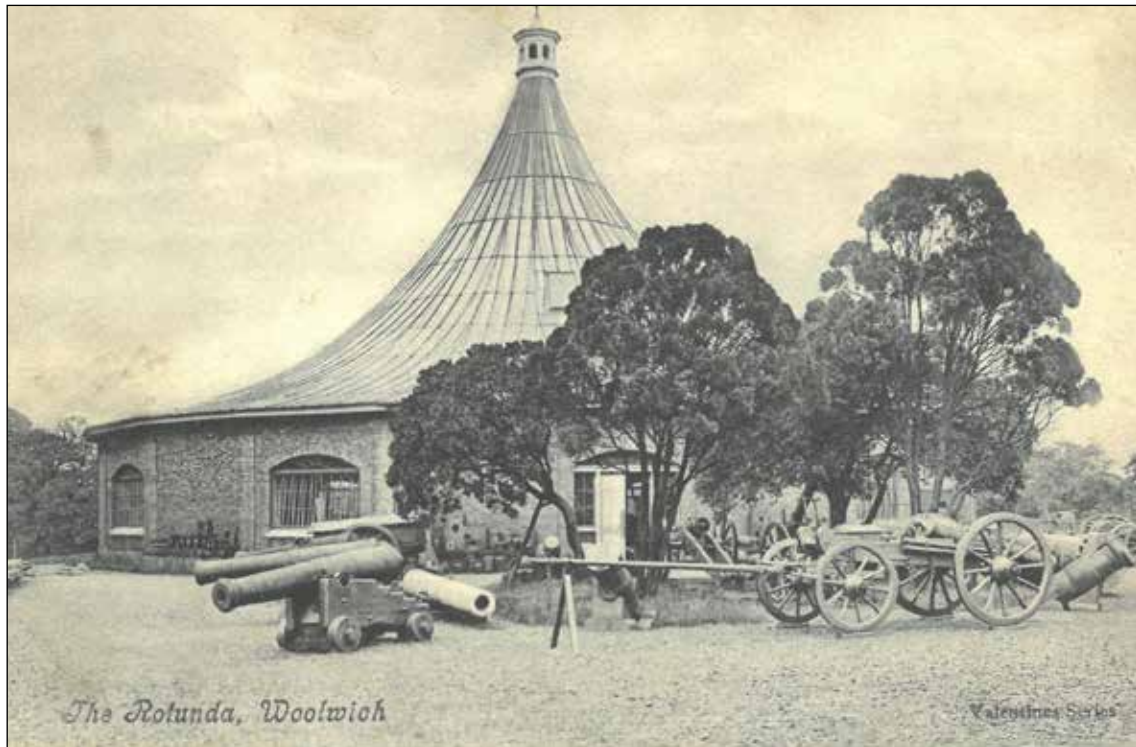


Fig. 38 Undated postcard of c. 1900 showing the Rotunda from the south, with its lead roof of the 1860s. (Historic England Archive)

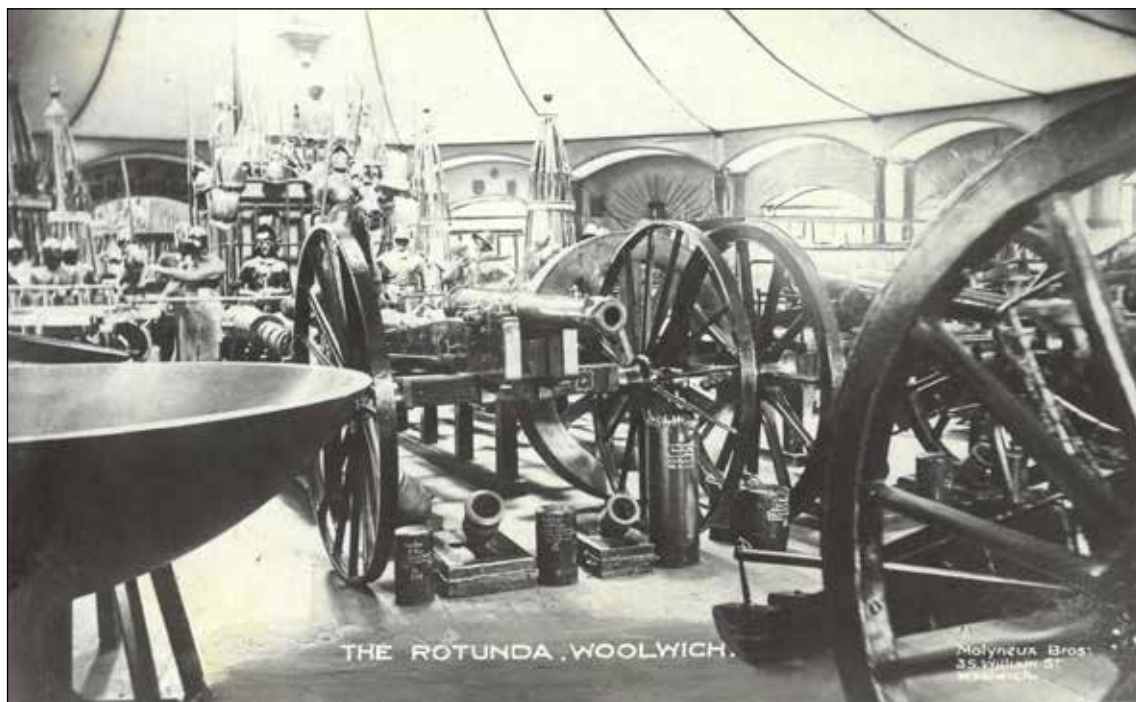


Fig. 39 An undated postcard produced by Molyneux Brothers of Woolwich showing the interior of the Rotunda in c. 1905, before the removal of many of the museum's best exhibits. (Historic England Archive)

More than nine hundred of the best exhibits were removed from the building, the Committee on Military Museums – a War Office body chaired by Lord Cottesloe – intending ‘that in future the Rotunda was to be purely a museum of Artillery’.⁴⁰¹ Nearly all of the armour – including one of the Rotunda’s finest exhibits, the suit of armour believed to have been worn by the French knight the Chevalier Bayard – was transferred to the Tower of London, where the Armouries were curated by Charles Ffoulkes, a friend of Brigadier-General Evans. Other exhibits were sent to the Imperial War Museum, whilst many of the small arms seem to have simply disappeared. The Rotunda received in return some important pieces of ordnance from the Tower, as well as donations from Windsor Castle and the Arsenal, but these hardly compensated for the loss of much of its core collection, including some of the Napoleonic war trophies.

This supposed rationalisation was retrospectively approved by the Army Council in 1929, and led to further losses; in 1934 all the naval models were deposited in the Maritime Museum, and by 1939 some 1,300 objects had been removed in total (Fig. 40). As J. P. Kaestlin has observed, these ‘loans’, as they were termed, ‘poleaxed’ the Rotunda and destroyed much of its integrity as a museum.⁴⁰² Considering the unfortunate consequences, Kaestlin wrote that ‘The idea got around that the Rotunda was for sharing, while those who cared for it lost heart and interest flagged.



Fig. 40 The interior of the Rotunda in 1934, following the removal of over 900 items from its collections as part of a ‘rationalisation’.
(© Historic England Archive, ref. bb42_01484)

The best reasons were adduced why things should be elsewhere and, with precedents so well established, invariably they went'.⁴⁰³

Perhaps unsurprisingly, a proposal was made in 1932 to close the museum entirely, largely on the grounds that its historic collection had shrunk and that it was no longer an attraction, either to visitors or local inhabitants. Following strong objections from Woolwich Borough Council, the Royal Artillery Institution tried to restore the profile of the Rotunda, not least by putting up signposts to the building – which had often proved difficult for visitors to locate – and by publishing a new, albeit inadequate, edition of the catalogue in 1934.⁴⁰⁴ The problems faced by the Rotunda during these years clearly demonstrate that it had ceased to be of relevance to the Royal Artillery, who had no incentive or interest in retaining either the building or its contents. In the context of the military build-up to the Second World War, it is perhaps understandable that the Rotunda was so neglected, but its decline was surely exacerbated by the failure after 1870 to appoint successive curators. Meanwhile, there were changes afoot elsewhere in Woolwich: in 1939, the Royal Military Academy left the common, ending a residence of nearly two hundred years.

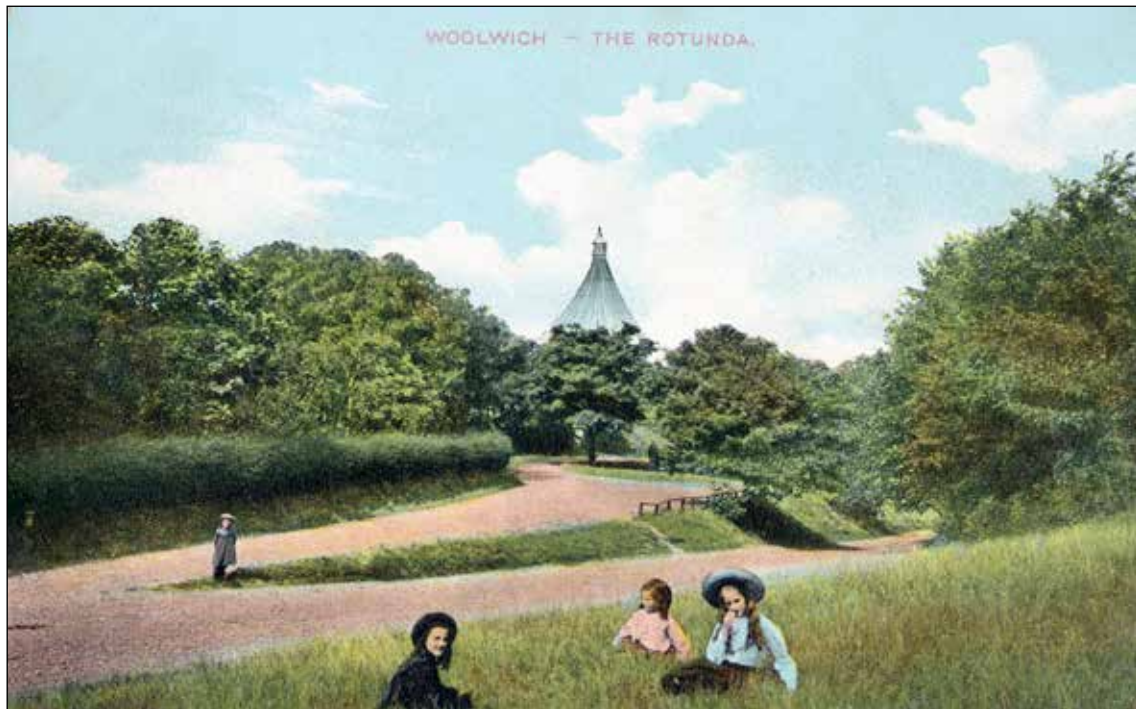


Fig. 41 Postcard view of Green Hill, Woolwich, with the Rotunda in the background, c. 1905-10. (Historic England Archive pc09020)

The physical condition of the Rotunda deteriorated at the same time as its historic collection was being eroded. It was closed for the duration of the Second World War and remarkably survived the Blitz intact, yet the lack of maintenance took its toll; unrepaired cracks in the lead roof – which had been painted in camouflage during wartime (see Fig. 84) – let in water that damaged the floor, and vermin and woodworm made inroads in some of the exhibits.⁴⁰⁵ Even so, it remained a popular and distinctive sight (Fig. 41). Writing in 1949, Sam Price Myers stated that:

Despite its modesty and seclusion, the Rotunda is the most attractive building on the Common. There is no mistaking its pagoda-like roof in a view dominated by four-square barrack building and much world-war shackery ... The contents of the Rotunda, a military museum open to the public, are of bewildering diversity; and, when you tire of them, you can turn your attention to the coombe seen westward through the railings. Here are the Repository Ponds on which, during Victorian military revels, a band afloat on a raft made music where now the silence is broken only by the crackle of musketry at the range.⁴⁰⁶

Despite the best efforts of A. J. (John) Dalkin (d. 1977), curator of the Rotunda between 1949 and 1974, the tough economic conditions after 1945 meant that remedial work was not carried out until 1951, when the roof and walls were patched up and the paper was removed from the canvas ceiling. However, the roof continued to fail and by 1954 'Nash's historic building was seemingly on the verge of collapse'.⁴⁰⁷ Finally, in 1957 – when funds became available – a programme of repairs was implemented, under the supervision of Dalkin and Major J. P. Kaestlin. These saw the roof of the building stabilised, the interior refurbished, the floor replaced and the ground surrounding the Rotunda tidied up and improved. In 1964, John Dalkin described the still-ongoing refurbishment to reporters from the *Kentish Times*, stating that he could not remember 'such a full-scale operation on the museum in the 15 years that he has been curator'. The lead roof was repaired 'from pinnacle to perimeter', and the floor inside underwent 'a thorough treatment by carpenters'.⁴⁰⁸

At the instigation of Major-General B. P. (Basil) Hughes (1903-89), Controller of the Royal Artillery Institution between 1958 and 1978, new acquisitions of both modern ordnance and historic items revived the collection. According to Major Richard G. Bartelot of the Royal Artillery Institution – who was serving as Assistant Historical Secretary by early 1976 – Hughes was a great benefactor of the Rotunda, and 'possessed a tremendous flair for regimental history in all its aspects'.⁴⁰⁹ He also liaised with national museums and local authorities in Britain and beyond, promoting the Rotunda's collections, perhaps at the expense of the building itself; in 1966, a scheme was discussed whereby the Royal Artillery Museum would be moved to nearby Greenhill Schools.⁴¹⁰ However, nothing of the sort came to pass, and by 1971 C. J. Evans was able to state that 'For anyone interested in the development of military ordnance the collection [of the Rotunda] is of primary importance, containing as it does many finely wrought and historic examples of the gunsmith's craft'.⁴¹¹

In 1963, a new catalogue – the first in over a quarter of a century – was compiled by Major Kaestlin, who worked in the historical section of the Royal Artillery (Fig. 42). Its publication was probably timed to coincide with the Third International Congress of Museums and Military History, which – involving 'a formidable body of historians from sixty-seven museums and twenty-six countries' – was due to visit the Rotunda that year.⁴¹² The booklet set out a comprehensive history of the building, advertised the fact that the museum was open all year round, except public holidays,

and proclaimed it to be 'in full resurgence'.⁴¹³ A further catalogue was issued in 1970; in that year, the 150th anniversary of the Rotunda's installation at Woolwich was celebrated with a week of events, which saw Army and museum dignitaries alike visit to pay tribute to the building and its unique history.⁴¹⁴

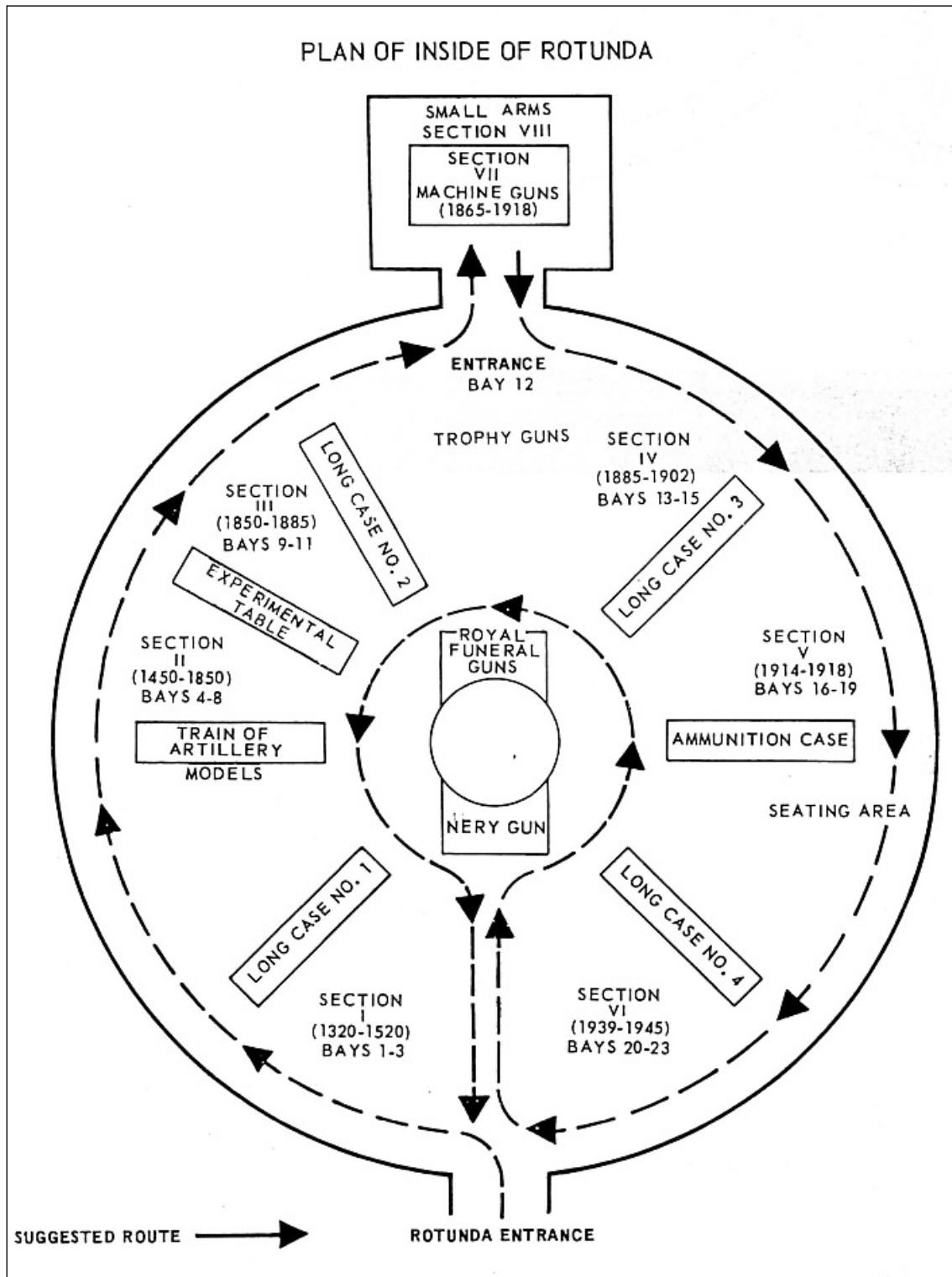


Fig. 42 Plan of the Rotunda showing the layout of exhibits, from J. P. Kaestlin's *Guide to the Museum of Artillery in the Rotunda, Woolwich* (1963). (Courtesy of the Royal Artillery Museum)

1972-1975

For the Rotunda, the year 1972 was the beginning of what has been described by Major Bartelot as ‘a three-year bad patch’, during which the building ‘almost finished up on the scrap heap’.⁴¹⁵ Following the Rotunda’s closure for maintenance work – a contract had been fixed for the supply of a new lead roof, canvas ceiling and lighting – it was found that the scale of decay was far worse than had ever been suspected. According to Major-General Hughes, ‘the timber structure hidden between the internal tent and the outer lead roof was seriously affected by worm and rot, and a very extensive task of restoration was essential’.⁴¹⁶ The Property Services Agency (PSA) – part of the Department of the Environment – entrusted the restoration work to Messrs Dove Brothers, an Islington-based firm of builders which had been operating successfully since the nineteenth century; Major Bartelot served as project manager on behalf of the Royal Artillery Institution.⁴¹⁷

As the museum had to be emptied of its contents, the opportunity was also taken to renew the Rotunda’s interior decoration. Major-General Hughes, writing in 1975, recounted that ‘on the advice of the Department of Fine Arts, a new colour scheme entirely appropriate to the date of the building and to its architectural features was substituted for the previous rather drab decoration’ (see Fig. 54).⁴¹⁸ This was partly out of necessity: according to John Pound, Senior Design Officer of the PSA Supplies Division, ‘During the investigation [of 1972] it was found that certain showcases and flooring had to be condemned due to either worm or rot’ (Fig. 43).⁴¹⁹ Work on the floor and internal wall posts began in late 1972 or early 1973. Along with the newly plastered and painted walls, it was finished by January 1974, and involved the insertion of concrete floors and reinforced wall posts (Figs 44-46). Although the canvas ceiling was retained ‘for effect’, it was completely renewed – both above the main internal space and above the surrounding alcoves. Photographs of October 1972 show the canvas more or less removed, allowing access to the roof (Figs 47 and 48, and see Fig. 27).⁴²⁰



Fig. 43 Photograph of 17 October 1972 showing one of the Rotunda’s timber wall posts and part of its wooden floor before removal as part of restoration. (© Crown copyright. Historic England Archive, ref. p_g18526_001)



Fig. 44 Installation of the concrete floor at the Rotunda, 5 April 1973. (© Crown copyright. Historic England Archive, ref. p_g19054_008)



Fig. 45 The exposed wall and roof structure at the perimeter of the Rotunda after the removal of an embedded timber wall post, and during installation of a new reinforced concrete post, 7 March 1973. (© Crown copyright. Historic England Archive, ref. p_g18760_002)

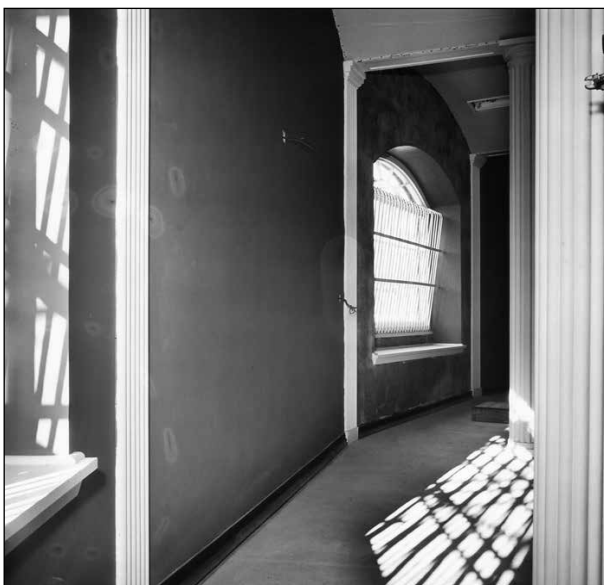


Fig. 46 Some of the alcoves at the perimeter of the Rotunda following restoration, 29 January 1974. (© Crown copyright. Historic England Archive, ref. p_g19988_002)



Fig. 47 The exposed roof structure following the removal of the canvas covering above the Rotunda's alcoves, 17 October 1972. (© Crown copyright. Historic England Archive, ref. p_g18526_017)



Fig. 48 The removal of the fabric lining of the Rotunda's roof, 17 October 1972. This canvas may have dated to the time of the building's original construction in the gardens of Carlton House in 1814, if not to the time of its re-erection at Woolwich in 1819-20. (© Crown copyright. Historic England Archive, ref. p_g18526_018)

Around the circumference of the building, the windows and their surrounds were removed for repair, and were then reset into the walls at a later stage; PSA photographs show that the final stage of this work took place in October 1973 (Fig. 49). Following discussion, it was decided that the bars to the windows should be reinstated.⁴²¹ The removal of the canvas ceiling enabled the trusses of the roof to be examined by DOE experts from the Princes Risborough laboratory; contrary to initial expectation, they ‘were found to be in reasonably good condition’.⁴²² Leakage through the roof, and consequent water damage, meant that some had to be renewed, but most were simply repaired; an account states that ‘The unusual layout of the roof supports required a complicated form of strutting while repairs were carried out. As a precaution all timbers were treated against fungal and insect attack’.⁴²³ Thus, the timbers of the roof are among the few components of the building which were not ‘restored’ or replaced in this 1970s scheme (Fig. 50).

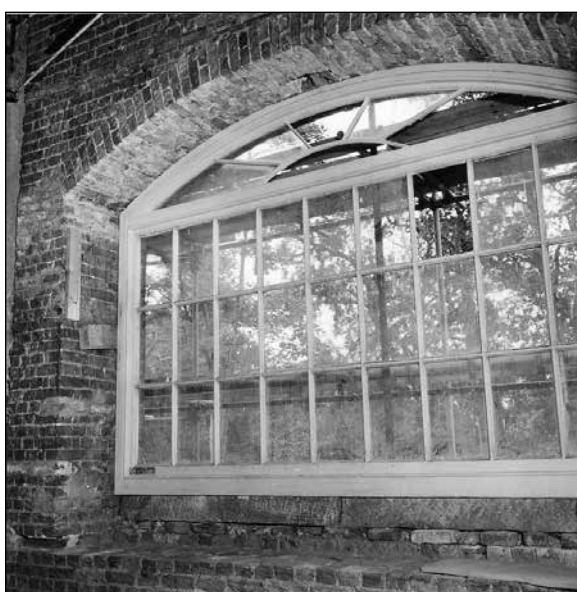


Fig. 49 A repaired and reinstated window at the Rotunda, 9 October 1973. (© Crown copyright. Historic England Archive, ref. p_g19692_004)



Fig. 50 The original roof structure of the Rotunda surviving above the replaced canvas lining, 24 July 2004. (© Historic England Archive, aa048107)

Meanwhile, the exterior of the roof (with its wartime camouflage paintwork) was stripped – work began in April 1973 and lasted for around a year (Figs 51-52, and see Figs 25-26). The Rotunda was then re-covered with sheet lead, a material found most suitable – though other options were considered.⁴²⁴ Apparently, the ‘original drips were omitted and replaced with simple laps; this improved the appearance and did away with the complicated roll joint which became exaggerated near the top of the circular roof’.⁴²⁵ The existing roof lights – introduced in the 1860s, and ‘always ... a source of trouble’ – were completely removed, thus preserving ‘an unbroken roof line’.⁴²⁶ The cupola which stood atop the roof was removed for restoration at the workshops of Dove Brothers; designed to aid ventilation of the building, it was reinstalled in March 1974, and was then newly leaded. According to a schedule of 27 February 1974, the external scaffolding was to be removed, and the lead made good, during the last two weeks of April of that year.⁴²⁷ Photographs prove that this work was certainly complete by 30 May, with an image of April 1975 recording the new external effect (Fig. 53).



Fig. 51 Repairs to the leadwork of the Rotunda’s roof being undertaken, 5 April 1973. (© Crown copyright. Historic England Archive, ref. p_g19054_004)



Fig. 52 The Rotunda at the start of repairs to the roof, on 5 April 1973, and before the removal of the Victorian rooflights. (© Crown copyright. Historic England Archive, ref. p_g19054_007)



Fig. 53 The Rotunda from the south-west on 9 April 1975, following the completion of the extensive restoration programme. (© Crown copyright. Historic England Archive, ref. p_g21156_003)

By January 1974, the new lighting of the interior of the Rotunda had been installed; it was said to be ‘in keeping with the character of the building consisting of modular fittings at the perimeter which are balanced with suspended clusters’ (Fig. 54).⁴²⁸ According to the schedule drawn up the following month, the new canvas ceiling – ‘put up in panels’ – was to be fixed during April and May 1974; photographs show that it was in place by 30 May.⁴²⁹ Above this – in the space between the ceiling and the roof – was placed a ‘catwalk’, intended to aid future inspection and maintenance.⁴³⁰ As soon as the internal scaffolding was removed – work set to take place in the last two weeks of May 1974 – the new floor covering was laid, marking the end of the Dove Brothers’ contract. Staff of the DOE and the Royal Artillery Institution – together with contractors – then saw through (in the following order): the installation of new wall cases, the return of the large guns and cannons, the installation of new desk cases (after the guns were in situ), the fixing of rifle racks in the gun room (north annex), and the return of the remaining exhibits.⁴³¹

The completion of the restoration was set, in February 1974, for November of that year, shortly after the retirement of John Dalkin, who had served as curator since 1949. However, although work was complete by April 1975 (and possibly earlier), the Rotunda only reopened on 1 June, under the care of a new curator, Mr S. C. Walter. On entering the radically refurbished museum, visitors were greeted by a fresh and

bright interior; the walls were colourfully painted, there were carpets over the floors, there was softer lighting, and an improved central heating system had been installed. The exhibits had been reordered, inviting visitors to move around the museum in a clockwise direction and to learn about the development of ordnance 'in a consecutive chronological sequence from the fourteenth century to the present day'; displays were explained thanks to the production of new graphics, including captions.⁴³²

There can be no doubt that, by the standards of the time, this work was carried out exceptionally well, and was responsible for securing the building's future. The Rotunda restoration was nominated (admittedly by the PSA itself) for a Heritage Year Award of 1973-74; the application, dated 15 January 1975, proudly described the various alterations, and stated that the total cost of the scheme had reached £206,000.⁴³³ The application seems to have been successful, as the Rotunda won an award in the European Architectural Heritage Year of 1975.⁴³⁴ Major-General Hughes, in an article published in the *Museums Journal* in March 1975, emphasised that the restoration work had 'been carried out with great care and skill', while Major Bartelot concluded: 'The Regiment now possessed a Museum that was able to compete on equal terms with the other national museums in content and building. Lefroy would have been more than satisfied with the result'.⁴³⁵ The Buildings of England volume *London 2: South*, originally published in 1983 and reprinted in 1994, stated matter-of-factly: 'Excellent restored in 1975'.⁴³⁶



Fig. 54 The interior of the Rotunda on 9 April 1975, following the completion of the extensive restoration programme. The museum reopened to the public on 1 June that year, with new features including carpeted floor, softer lighting and reorganised exhibits. (© Crown copyright. Historic England Archive, ref. p_g21156_001)

However, looking over the evidence of the work carried out in 1972-75, it is difficult not to bemoan the scale of intervention. The timber (and cast iron) removed by Dove Brothers was probably, to a very large extent, that erected by John Nash and his workmen, both at Carlton House and at Woolwich in 1819-20. The canvas ceiling may also have dated from this period (Fig. 55; compare Scharf's view of 1828, see Fig. 20). In 1949, Sam Price Myers had reported that, 'According to the custodian, the wallpaper-covered roof-lining is the original canvas which roofed the structure in St James's Park, and the heavy ropes, radiating from the turreted peak, which sustained the canvas still show a little of the gilt with which they were originally enriched'.⁴³⁷ Major-General Hughes was another who believed the canvas to have been early nineteenth-century in date, stating – rather lamely, to modern ears – that 'Unfortunately the original tent, which had been suspended below the roof for nearly 160 years, was found to be so rotten that it had to be replaced by a replica'.⁴³⁸ Although the lead roof was Victorian (see pp. 79-82), it may have retained important evidence about the form and material of the earlier structure which it replaced, and which has been the cause of such debate. That the tented ceiling and the timber of the outer wall, the inner ring of columns and the floor could not have been preserved in part – despite the scale of decay – is a matter of particular regret, and goes some way to proving E. F. E. Jefferson's statement of 1970 that 'it cannot be said that the Rotunda is appreciated as it deserves'.⁴³⁹



Fig. 55 The Rotunda's canvas ceiling on 6 April 1971, before 'restoration'. This fabric roof lining, with its radiating ropes, was probably to a large extent that erected by John Nash and his workmen at Carlton House in 1814 and re-erected at Woolwich in 1819-20. Compare George Scharf's painting of 1828 (see Fig. 20). (© Crown copyright. Historic England Archive, ref. p_g15031_007)

1975-2009

Whilst the restoration of the 1970s may have lost something of its gilded edge today, it certainly helped to ensure the museum's continued popularity, and made it more successful in educating the wider public. Under the direction of Major-General Hughes and the Rotunda's curator, S. C. Walter, its collection was further expanded, taking in items such as AA radars; there was also an exhibition room, 'used to stage exhibitions as well as to provide a display of great interest to children'.⁴⁴⁰ According to Hughes, this exhibition room – at the south-west corner of the Rotunda compound – contained guns which could be operated, dioramas of battle scenes which could be lit up, and a full-size model of the Duke of Wellington's horse, Copenhagen (which had formed part of the museum's collections for many years).⁴⁴¹

For Bartelot, writing in 1978, the Rotunda was undoubtedly 'one of the best artillery museums in the world'; he added that 'Even Lefroy would be pleased to know that it is now accepted as a National Museum ranking on a par with all the great Service museums in the United Kingdom'.⁴⁴² In 1977, visitor attendance figures reached the record number of 81,230 per annum – they had been about 45,000 before the museum's closure for restoration.⁴⁴³ Architecturally, also, the building came to be better valued. It was listed at grade II on 8 June 1973 – right in the middle of the refurbishment – and was upgraded to grade II* on 30 January 1990.

Nonetheless, by the late 1980s there was concern about an increasing shortage of space for the collections and weather damage; the items spread around the compound were being damaged by acid rain, while the structure itself required repair – especially the roof. An alternative site for the Royal Artillery Museum began to be considered. An article published in the *Architects' Journal* in 1989 discussed proposals for a new museum building at Larkhill on Salisbury Plain, to be designed by Avery Associates.⁴⁴⁴ The plans were mentioned again in the article 'Gunners' Target: New Museum', published in *Country Life* in 1991; this stated that 'The museum to be built at Larkhill will house not only the present collection at the Rotunda, with space for later additions. It is badly needed also to house the artillery medal collection, the regimental library and the Royal Regiment's archives'.⁴⁴⁵

However, by 1994 there had been a change of mind: rather than transfer the museum's contents to Wiltshire, it was decided to create an alternative museum in the Woolwich Arsenal itself, a move enabled by the historic departure of the Army from the site that year. Meanwhile, the Rotunda remained functional; in 1995, the curator was still S. C. Walter, and opening hours were Monday to Friday from 1pm till 4pm.⁴⁴⁶ Regeneration of the Arsenal began in 1999, and the majority of the exhibits were moved from the Rotunda to Firepower, the new Royal Artillery Museum, which opened in May 2001. Thus, the Rotunda – left to function as a storehouse for Firepower's reserve collection – ceased to function as a museum in its own right, and was closed to the general public. Given the building's 180-year history as a museum of artillery, this radical change came quietly – if not suddenly – and with few expressions of regret, perhaps reflecting its relative obscurity as a public resource. The Army – or at least the website of Firepower – chose to couch the move in positive, and historic, terms, stating that 'The Museum had returned to the

original home of the Regiment and indeed of the collection', founded by Congreve in 1778 at the Royal Arsenal.⁴⁴⁷ In autumn 2008 there began a major reorganisation of the Royal Artillery Museum's reserve collection, including that at the Rotunda, with the intention of transferring the vast majority of the exhibits to Firepower by 2009. Those items that are not housed in the Arsenal are likely to be moved to Larkhill, the principal base of the Royal Artillery since May 2007.

In the wake of this development – the focus for much energy and financial input – the Rotunda has been left stranded and vacant, though not unloved. The building's architectural, structural and historic importance has been increasingly and more widely recognised, though since 2007 it has featured on the English Heritage Buildings at Risk register.⁴⁴⁸ It is as part of the search for a new role for this unique building (Fig. 56) that the present report has been produced.



Fig. 56 The exterior of the Rotunda in 2010, following the removal of most of the artillery exhibits which formerly surrounded it. (© Historic England Archive, ref. dp093979)

PART TWO: STRUCTURE - JONATHAN CLARKE

THE STRUCTURAL DESIGN OF THE ROTUNDA

The Structural Elements

In overall form and structural behaviour the re-erected building that stands at Woolwich is much the same as the building erected in the gardens of Carlton House. Some of the original materials were found to have had decayed beyond re-use during the course of rebuilding, but they were replaced by duplicate items. These included a large number of joists, rafters, floor and roof boards, as well as spikes, nails, bolts, etc. and a new outer canvas lining for the roof, replacing that which had been supplied originally by James Baber's Patent Floor Cloth Manufactory (see p. 31 and p. 43). Besides the addition of brick walls, which assisted the wall posts in supporting the wall plates, the principal modification was the introduction of a giant stone Doric column (see p. 58; Fig. 57, and see Fig. 20). It has long been presumed that its purpose was to help bear the additional weight of the lead roofing, thought to have been added in c. 1819 when the Rotunda was rebuilt.⁴⁴⁹ However, as has been shown (see pp. 61, 65 and 79-82), the lead covering does not seem to have been added until the early 1860s, when a major refurbishment was undertaken at the museum. Until then, the roof covering probably comprised solely of half-inch deal boarding under canvas sheeting, and it notable that the horizontal boarding indicated by early and mid-nineteenth-century illustrations was visually distinct from the vertical roll-joints shown in the earliest photographs of the later 1800s.

So why was the column introduced? The reason doubtless stems from the fact that the structure's status was now permanent. It may have been intended as a fail-safe, in the event that the iron hoops binding the ribs together broke, or to ensure that a particularly strong wind-generated deflection of the timbers did not end catastrophically.⁴⁵⁰ Then again, its imposition may have been as much symbolic as structural, dignifying the museum interior with a feature associated



Fig. 57 The interior of the Rotunda in 2010, showing the building emptied of its exhibits, many of which were moved to the new Royal Artillery Museum, Firepower, opened in 2001. (© Historic England Archive, ref. dp093980)

with permanence and authority. Certainly there is a commemorative aspect to it, for the names of former artillery officers adorn the shaft, although at what point the painting of these began is unknown. But we can assume that its structural role became all the more crucial from the 1860s, because the weight of the new lead roof would have imposed considerable loads on the timber roof structure otherwise, causing it to spread outwards and thrust excessively against the enclosing walls.

There are three inter-related aspects to the structural design of the Rotunda that, because of their special interest, deserve comment: the unusual geometry of the structure, the form and behaviour of the trussed ribs, and the use of laminated timber and specialised iron fasteners or connectors (Figs 58-59). Taking the first of these, John Nash was faced with the difficulties associated with the peculiar tented form he wanted to achieve. Framing a three-dimensional hemispherical structure over a circular space was complicated enough in itself, especially if the span was large, since it brought with it the problems of intersecting structural members, of providing the basic frame for the outer dome shape using straight timbers and, where an inner dome that rose above the wall plate was required, finding ways around the use of simple tie beams to counteract outward spread of the ribs. Framing a three-dimensional timber structure that looked convincingly like a tent both inside and outside, with a concave rather than convex curve, and which could not therefore rely on the mechanics of arch action, was perhaps more problematic. The fact that the structure ought not to exert any significant outward pressure on the (original) timber enclosing walls compounded the complexity of Nash's mission.

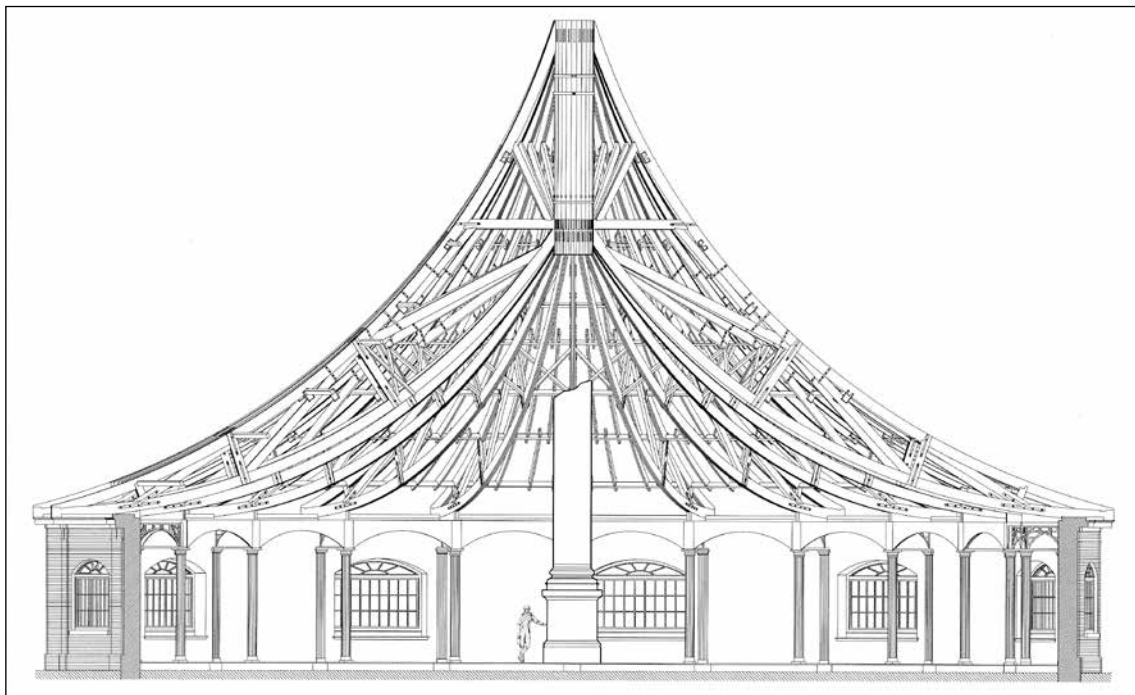


Fig. 58 Sectional view of the Rotunda as it survives today. The central 'freestone' column seems to have been one of the last components to be added when the building was re-erected in Woolwich in 1819-20. (© Historic England, Andy Donald)

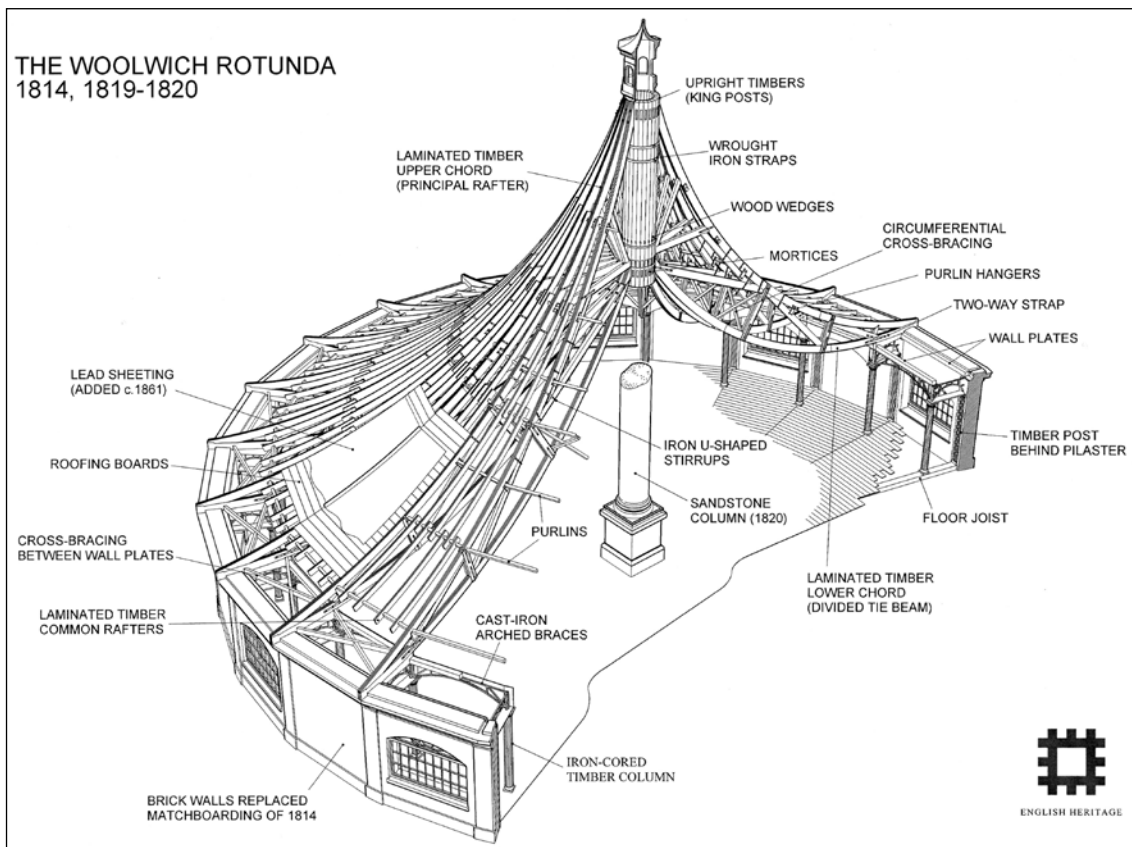


Fig. 59 Perspective view of the Rotunda as it survives today, showing the tented form of the roof structure. It would seem that weighty lead sheeting only replaced the outer canvas covering in the 1860s – more than forty years after the column was introduced. (© Historic England, Andy Donald)

In essence, Nash was tasked with creating a rigid catenoidal enclosure, one that covered an unobstructed area of some 10,600 sq. ft, and whose 116 ft-span actually exceeded the clear diameters of many of what were then the world's largest domes, including Hagia Sophia, Istanbul (115 ft), and St Paul's Cathedral, London (112 ft). The Rotunda's elegant curvature, both inside and out, was based on the catenary, the curve formed by a chain or rope of uniform density hanging freely from two fixed points not in the same vertical line. Tent profiles were archetypal examples of catenaries, as were the hanging chains or ropes of suspension bridges. But although the catenary curve had been observed for centuries, its correct mathematical equation was not finally deduced until the early 1690s, appreciation of its inherent structural and geometrical advantages following.

In 1697 the Scottish mathematician David Gregory published his theoretical determinations on the subject. These showed that if the catenary curve was the most efficient profile for transmitting tensile forces, then it followed that the inverted catenary curve was the most efficient profile for the arch and the dome, acting in compression.⁴⁵¹ Christopher Wren and Robert Hooke used this logic of converting pure geometry into mechanics in their final design for a self-supporting inverted-catenary inner-brick dome at St Paul's Cathedral.⁴⁵² Later, in 1744, the Swiss mathematician Leonhard Euler showed that the catenoid, or shape formed by the revolution of a catenary about its axis, had the minimum surface area for a

given bounding circle.⁴⁵³ In architectural terms this might have translated into the eighteenth-century realisation that, for a given circumference and height, catenoids required less cladding than hemispherical domes.

Whether Nash was aware of these developments, and whether he thought to exploit them in the Rotunda, seems doubtful. Nash was not mathematically minded, but he did possess an intuitive and discerning ‘feel’ for structure. At the very least, as a light pencil sketch on the back of the 1814 section of the Rotunda shows (Fig. 60), Nash was concerned with arriving at the correct catenary curve.

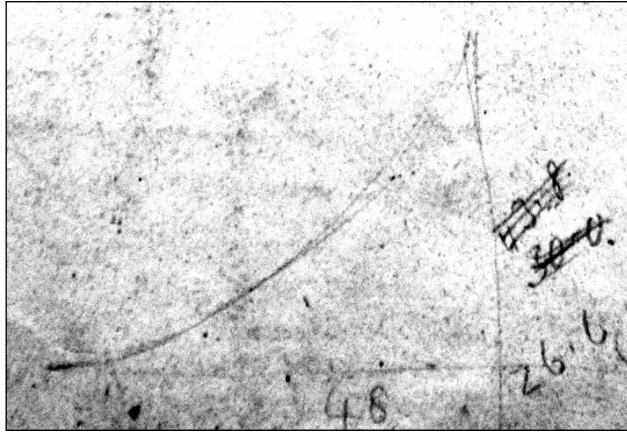


Fig. 60 Sketch for a catenary curve on the back of John Nash's section for the Rotunda or 'tent room', 1814 (see Fig. 12). Nash seems to have been considering a structure 96 feet in diameter, compared with 120 feet in Figs 10-13 and as built. (The National Archives, ref. WORK 43/575, verso)

Taking a second aspect of the structural design – the form and behaviour of the trussed ribs – it is evident that the overall structure was conceived as a three-dimensional divided tie-beam truss, with the upright timbers of each opposing pair of half ribs forming the king post, the upper chords acting as the principal rafters, and the lower chords functioning as the tie beam (Fig. 61). As David Yeomans has shown, early nineteenth-century American carpenters seemingly devised and refined an ingenious trussed arrangement to accommodate raised ceilings, one that differed markedly from the usual British solution of raising the tie beam above the wall plate.⁴⁵⁴ The American architect Asher Benjamin (1773-1845), for example, illustrated a divided tie beam arrangement in the second edition of his *American Builder's Companion*, published in 1811. By dividing the tie beam into two lengths and slanting each half upward to the king post, a higher ceiling could be accommodated without the problems associated with the raised tie-beam arrangement, the most acute of which was ensuring sufficiently strong connections to transmit the substantial tensile force between the tie and the principal rafters. But the major reason why Nash used the divided tie-beam truss for the roof of his 'Polygon Room' was because, made up of two identical halves with a shared kingpost, it lent itself to a radial arrangement that eliminated the problem of intersecting tie beams. To have radially united twelve trusses of raised tie-beam configuration would have been almost impossible, and would not anyway have provided the requisite interior volume or curvilinear geometry.

Viewed in this light, the roof structure of the Rotunda is made up of twenty-four radial trussed half-ribs, bound together by their upright ends which form a giant

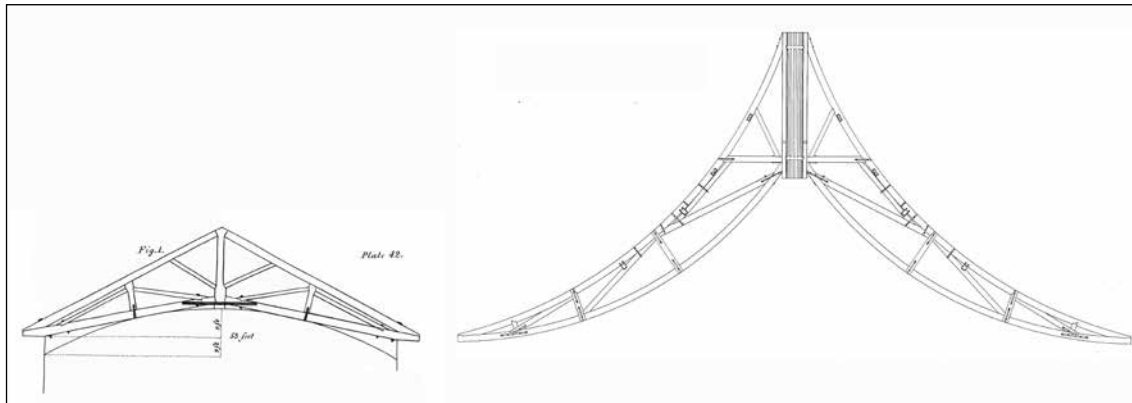


Fig. 61 Divided tie beam truss arrangements as illustrated in Asher Benjamin's *American Builder's Companion* (1811; left) and in the Rotunda or 'Polygon Room' (1814; right; © Historic England).

shared king post. Notwithstanding the steeply concave upper and lower chords, the arrangement of each truss bears a noticeable similarity to that shown by Asher Benjamin, which itself is loosely based around the king-post theme, with pairs of secondary posts and struts used to give support to the tie and strengthen the principals against bending. In both cases, the lower chord or tie beam provides restraint against the outward thrust of the principals, which in the case of the Rotunda is quite excessive, since, rather than being straight or curving inwards, it curves outwards. The weight of the seasoned timber roof structure alone, without canvas or boarded roof covering, is calculated to be some 124 tons, and the outward thrust would have naturally tended to straighten out the ties. Thus the strength of the joints between the tie beams and the upright timbers forming the cylindrical king post, and the hoops binding these together, was absolutely critical to the success of the structure. Total reliance was placed on the ability of wrought iron to transmit and resist tensile forces at these points.

On account of the inaccessibility of this part of the roof structure, it is unclear exactly how the tie beams are connected to the uprights, but a detail of Nash's original drawing suggests that heavy bridle straps and long coach bolts were essential (Fig. 62). With the half-ribs given stiffness in their own plane by circumferential purlins and diagonal braces, and restrained from spreading outwards by the divided tie beam, the weight of the roof was transferred vertically onto the double ring of wall plates, with, ostensibly, little need for these to contain thrust. Again, these, like much of the roof structure, are inaccessible to inspection, and it is possible that the individual plates forming them are strapped end-to-end, producing two continuous polygonal 'tension rings' that may resist any remaining outward thrust.⁴⁵⁵ However, the original drawings do not indicate any ironwork connecting the plates (Fig. 63).

The third noteworthy aspect of the structural design is the use of laminated timber and specialised iron fasteners or connectors. The upper and lower chords are made up from four layers of vertically laminated planks, strapped together so that the inner two break joint with the outer ones. The posts and rafters are also made from laminated timber, although in just three and two thicknesses respectively. Curiously, the 1814 drawings make no indication of laminated timber, although we must presume it was original to the design since there is no indication in the accounts of

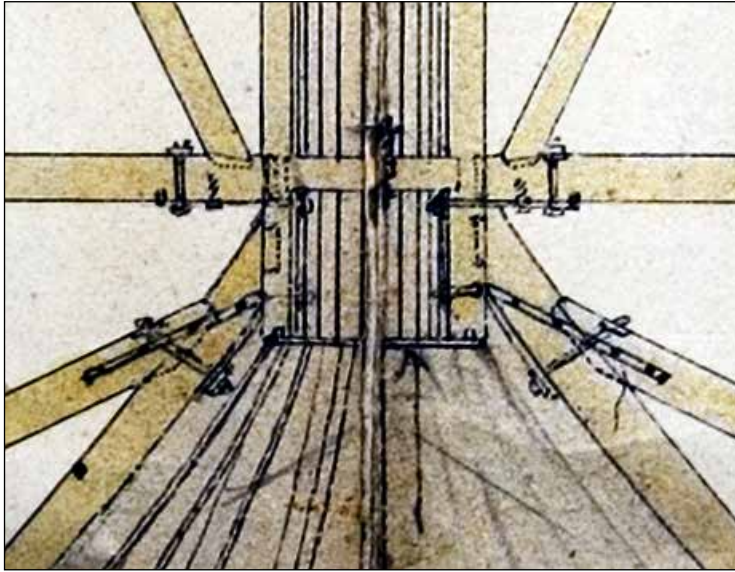


Fig. 62 Detail of the 1814 section of the Rotunda or 'tent room' (see Fig. 12), showing the ironwork used to connect the tie beams to the upright timbers forming the cylindrical kingpost. (The National Archives, ref. WORK 43/575)

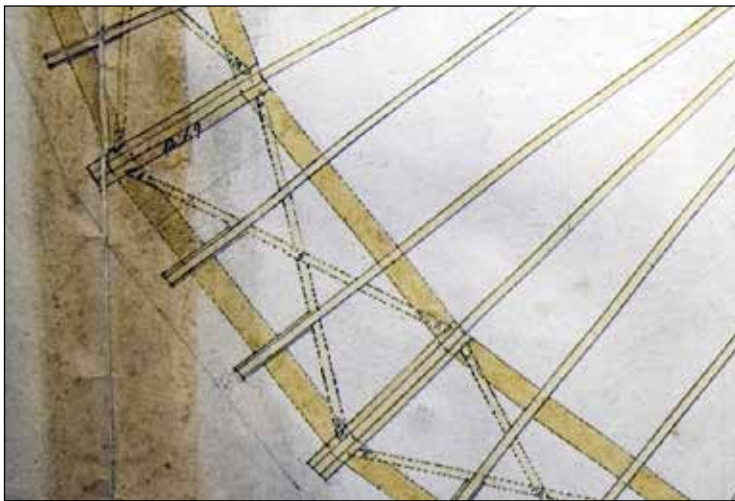


Fig. 63 Detail of the 1814 roof plan of the Rotunda (see Fig. 11), showing the triangularly braced double wall plate. (The National Archives, ref. WORK 43/574)

the re-erection that the ribs were modified or replaced. The 1814 roof plan also shows a different arrangement of rafters (see Fig. 11), and it would seem that there must have been a slight modification to the design after May 1814 when the plans were drawn, due perhaps to the practical advice of one of the carpenters involved at Carlton House – if not Nixon possibly John William Hiort, who Nash employed as Clerk of Works and Measurer (see p. 28).⁴⁵⁶ The use of laminated timber was a logical choice for the upper and lower chords as it gave them the necessary curvature without compromising structural continuity.

Forces were transmitted from one plank to the other by a combination of direct timber-to-timber frictional bearing and the bearing on the coach bolts that passed through the connecting straps. Some of these connectors seem to have been specially designed for the purpose, including forged shaped fishplates (Fig. 64), and Y-shaped two-way straps, used to connect the lowest brace with the foot of the lower chord (see Figs 12 and 59). For the most part, however, the planks were simply clamped and bolted together at the points where the posts and struts are joined to the chords, with the more usual bolted iron stirrups passing over the heads and feet of the

posts, and over the back of the upper chord around the struts (Fig. 65). Although the structural necessity of passing the straps over the back of the upper chord is questionable, it made sense practically, since the flat base of the inverted stirrup ensured vertical alignment of the roughly-hewn planks, creating a flush surface for the boarded casing. Passing the U-shaped pieces of iron over the foot of the posts was however structurally imperative, since they slung up the lower chords. Here, the use of laminated timber came into its own, for the outer pair of planks forming the posts were lapped over the innermost plank of the lower chord and the feet of the struts, enabling forces to be transmitted by both bolts and direct timber to timber bearing. Somewhat inelegant of appearance, it nonetheless avoided complex carpentry joints, and was therefore ideally suited to use in structures intended to be demountable, and where construction was in any case designedly hidden from view. A similar jointing technique with doubled posts of this type was used by William Wilkins in the roof over the hall at Downing College, Cambridge, erected some time between 1807 and 1820.⁴⁵⁷



Fig. 64 Forged-iron fishplate in the roof of the Rotunda, used here to splice the laminated timber upper chord. (© Historic England, Jonathan Clarke)



Fig. 65 Inverted U-shaped iron stirrup in the roof of the Rotunda, fastening the laminated upper chord to two struts. (© Historic England Archive, Patricia Payne, ref. aa048109)

Structural Influences and Forerunners

There is no known direct precedent for the ‘Polygloom Room’ at Carlton House. It was a highly innovative structure, a classic example of structural form following architectural appearance. That it took its catenoidal shape from military and festive tents there can be little doubt, as this was a form frequently on display in late Georgian Britain.⁴⁵⁸ Specifically, Nash seems to have emulated the form of the British Army bell tent, a type introduced in c. 1794 to replace the inferior ridge-pole infantry tents and one that figured prominently in Wellington’s Peninsular campaigns.⁴⁵⁹ But appearance was one thing; actually framing a large conical enclosure was another. Besides apprenticeship, the chief medium for the transmission and diffusion of structural carpentry techniques in the eighteenth and early nineteenth centuries were illustrated carpenter’s manuals. As David Yeomans has shown, besides providing instruction in the framing of roofs and floors, manuals of this period also dealt with elementary geometry and how it could be applied to the practical problems of setting out work.⁴⁶⁰

Francis Price, in the second edition of his *British Carpenter, or A Treatise on Carpentry* (1735), illustrated a number of ‘curvilinear Roofs of great Extent’. One of these, which he thought would suit as a round temple, gave a sweeping tent-like exterior, although the raised tie beam framing arrangement only allowed for a hemispherical interior (Fig. 66, left). It is difficult to see how this trussed structure might have been realised three-dimensionally given the problem of intersecting timbers; besides, it did not really resolve the problem of outward thrust, which Price thought was ‘the chief difficulty to struggle with’.⁴⁶¹ His solution was to reinforce the circular plate or curb by bolting a polygrammatic arrangement of timbers to it in the horizontal plane, an inelegant countermeasure that would have diminished the openness and circularity of the interior. A similar design appeared later in the century, within the 1769 edition of William Pain’s *The Builder’s Companion and Workman’s Director* (Fig. 66, right). Pain was perhaps the most prolific British author of carpentry manuals in the late eighteenth century, and one of the hallmarks of his work was clarity of constructional detailing. Like Price’s design, on which it was certainly based, this was essentially a raised tie-beam truss, embellished with additional principals, both curved and straight. But this design came closer to producing a conical interior that more closely mirrored the exterior, and it showed

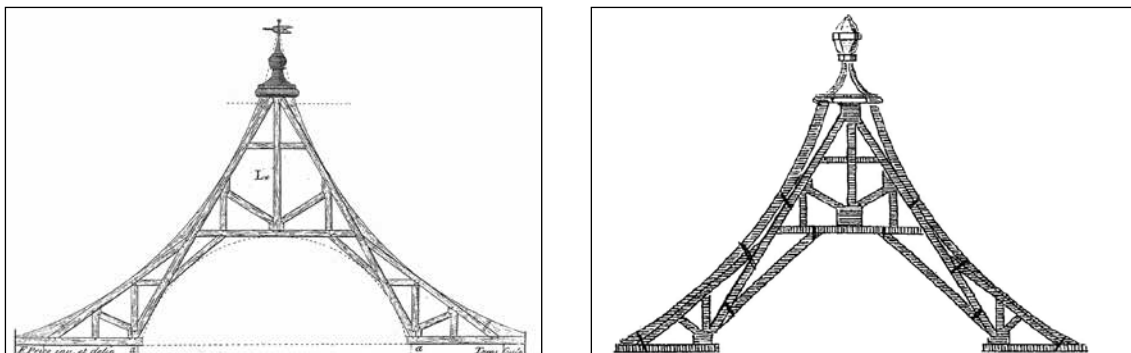


Fig. 66 Designs for framing circular temples, that on the left illustrated in Francis Price’s *British Carpenter* (1735) and that on the right in William Pain’s *The Builder’s Companion and Workman’s Director* (1769). Both are elaborations of the raised tie beam truss.

the widespread use of iron strapping rather than the pegged joints and bolted connections of Price's drawing.

It was, however, the thinking of the period's most accomplished British carpenter that most directly informed the structural design of the Rotunda. Peter Nicholson (1765-1844), the prodigious and influential carpenter-mathematician, produced a design that seems, with the benefit of hindsight, to have broken new ground. First illustrated in his *Carpenter's & Joiner's Assistant* of 1797, his design for a 'circular building' simultaneously solved the problems of outward thrust, intersecting members and of preserving interior volume and shape (Fig. 67). What he proposed was a radial array of half trusses, their tie beams connected to the foot of a central shared king post via a multi-armed iron strap. In this case eight tie beams could be united, but, as he put it, the iron strap could consist of 'as many branches as there are tie-beams to be united'. With the strap firmly bolted to the king post, and with the tie beams firmly bolted to the strap, the whole structure would, according to Nicholson, be 'render[ed] ... secure and permanent'.⁴⁶² It was an adroit divided tie-beam arrangement that, thanks to the iron strap, connected the two halves of each opposing tie as well as the ties to the king post. However, it did not explain how the principals were united around the head of the king post, and it can only be presumed that a similar iron connector was to be employed there also. For stability it also required that the lowest struts were extended below the tie beams to brace against the polygonal walls, circumscribing the open space below the wall plate. Nevertheless, the innovative design continued to be published in subsequent editions of the *Carpenters & Joiner's Assistant*⁴⁶³ and in other works by Nicholson and his son,⁴⁶⁴ as well as being appropriated by others as late as 1843.⁴⁶⁵ The designers of the 'Polygon Room' would thus have had ample opportunity to see Nicholson's design before May 1814, when the unsigned drawings of the building were produced (see Figs 10-13).

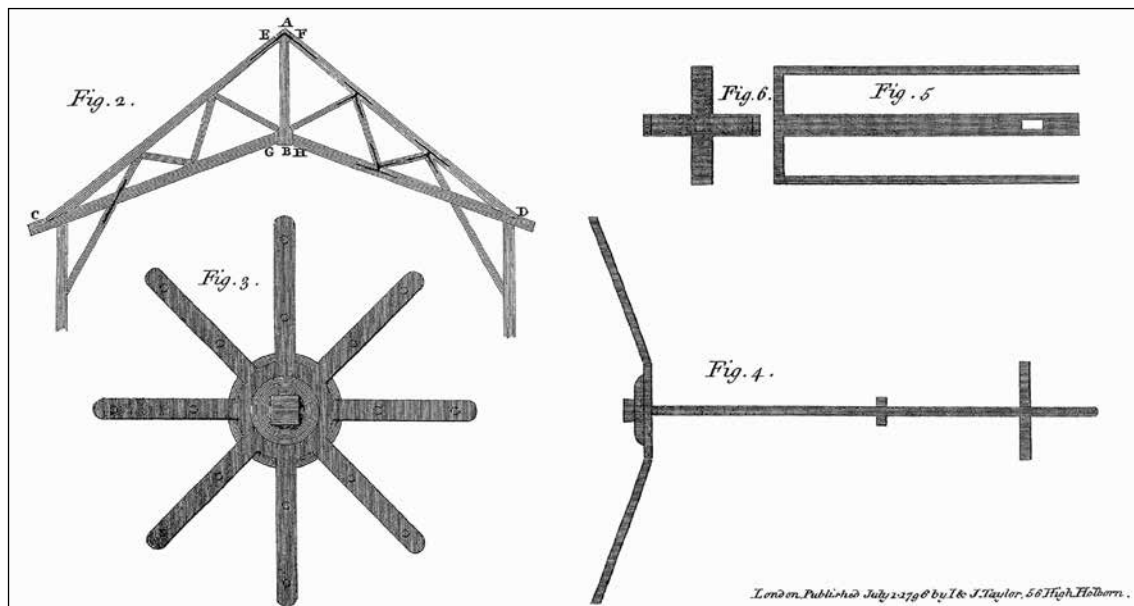


Fig. 67 Peter Nicholson's design for framing a circular building, as published in *The Carpenters and Joiner's Assistant* (1797), plate 77. As well as being the first recorded example of a divided tie beam truss, it incorporated an ingenious iron device for uniting the eight tie beams with the king post.

Who designed the roof: Nash or Nixon?

Responsibility for the structural design of the Rotunda is unclear. This is partly because the distinction between architect and carpenter was still blurred in the early nineteenth century, and partly because John Nash was consistently at the forefront of architectural technology. He started out as a carpenter-architect – designing for example a new double roof for St Peter’s Church, Carmarthen, in 1785 – and by the beginning of the nineteenth century, when he had reached gentleman-architect status, he was well practised in both structural carpentry and iron construction.⁴⁶⁶ Nash was experienced in timber-dome construction, giving, for instance, Caledon House, County Tyrone, two domed extensions c. 1812. When one of these domes began ‘swagging’, he gave explicit remedial instructions to the owner, demonstrating both his appreciation of timber shrinkage and the value of iron straps:

the construction by which the dome is supported is capable of sustaining treble the weight ... I am of opinion it will be found that the timbers have shrunk which all timbers will do – & that screwing them up into their place again will bring the whole right again – it is also possible that the carpenter who fixed the framing may have neglected to wedge it up tight or may have omitted the Iron straps.⁴⁶⁷

Near the end of his career Nash maintained that ‘No founder ever furnished me with a design for any casting I ever used’.⁴⁶⁸ The architectural historian John Summerson thought that ‘Nash was the last English architect to consider himself not only an architect but an engineer’.⁴⁶⁹

Nash’s proficiency in structural design is only half the story, for T. F. Hunt wrote in 1830 that the roof of the Rotunda ‘was *designed or invented* by, and executed under the direction of, the late William Nixon, a modest and retiring man, of rare worth and talent’ (see p. 34).⁴⁷⁰ Unfortunately, Hunt is not entirely reliable, and may have conflated the London carpenter William Nixon who died in 1826 with a Carlisle-based builder and surveyor of the same name, who died in 1824.⁴⁷¹ A later edition of the book, published in 1836, says that he came from Carlisle and designed the county gaol there, shortly before his death.⁴⁷² There is no evidence that Nixon the carpenter worked in the north; in fact, very little is known of Nash’s William Nixon at all. Trade directories show that two carpenters, William Nixon and William Nixon Jnr (presumably father and son), were working from Cockfosters, Enfield Chase, in 1808.⁴⁷³ By 1811 James Wyatt, Surveyor-General of the Office of Works, had made Nixon a superintendent of works at Carlton House, and it was there that Nixon came into Nash’s orbit. Nash recounted the circumstances in a letter of March 1815:

In the course of the work I found it impracticable to communicate my directions through the Clerk of Works or Labourer in trust, their other avocations allowing them very seldom to be there. I therefore availed myself of a very intelligent man (Wm Nixon) whom I found at Carlton House placed there by the late Mr Wyatt, and through whom I directed the works which have been executed.⁴⁷⁴

Through Nash's patronage and his employment with the Office of Works, Nixon became Clerk of Works at Brighton and general superintendent at Buckingham Palace. In his will, written from St James's Palace and proved on 30 April 1827, he bequeathed his architectural books to his two sons, William and Charles Nixon.⁴⁷⁵ Nixon had clearly developed an excellent working relationship with Nash, one of his executors, over the last fifteen years of his life. As has been noted earlier in this report (see p. 35), Nash paid tribute to Nixon for his work at Brighton in a letter of c. 1821, declaring him 'the most diligent attentive and the most honest Clerk of the Works that I have ever met with'.⁴⁷⁶ His son, William Nixon Jnr (c. 1810-48), who eventually headed the Office of Works at Edinburgh, enjoyed an even closer working relationship with Nash, and was probably employed as Nash's agent and clerk of works on the Isle of Wight.⁴⁷⁷

The structural design of the Rotunda must have been intensely collaborative at all stages. As we have seen, in 1818 Nash stated that Nixon built the Rotunda 'under my directions'.⁴⁷⁸ This leaves scope for Nixon to have resolved detailed aspects of the structural carpentry, such as the ingenious method of connecting twenty-four half-trusses using bevelled king posts, hoops and wedges. This practical modification of Nicholson's contrivance was probably derived from experience or knowledge of coopering or timber winding-drum manufacture. It is likely that Nixon had more need, and more opportunity, to keep himself abreast of developments in structural carpentry. He was no doubt familiar with Nicholson's work, if not the man.⁴⁷⁹ Nixon may even have introduced the idea of divided tie-beam trusses, as the only practical means of structuring the interior catenoidal form that Nash wanted. It should, finally, be remembered that on top of other commitments, Nash had to design fifteen to twenty temporary buildings in less than three months. He cannot have devoted much time to any.

CONES AT BRIGHTON

In 1815, the year after the Carlton House fête, John Nash began remodelling the Brighton Pavilion for the Prince Regent. His preliminary design for the east front was a somewhat uninspired affair, with a large onion dome in the centre, flanked by smaller, squatter domes either side.⁴⁸⁰ The design that was erected in 1817-20 is the celebrated medley of domes, cones and minarets that survives today, with two sweeping concave tent roofs balancing the central convex dome (Figs 68-69). Nash stated that he had placed both designs before the Prince Regent in 1815, and that the Prince chose the conical version, even though it was more expensive. Some historians, however, maintain that the final solution was only arrived at during the course of building work in 1817.⁴⁸¹

Whatever the truth of the matter, the tented roofs over the Music and Banqueting Rooms were direct progeny of Nash's Rotunda or 'Polygon Room' – smaller, but in some ways more refined. Brighton's two soaring conical timber frameworks span 40ft between wall plates, each being made up of twenty radial laminated timber half-ribs strapped together by their upright inner parts. For these lower, flatter ceilings it was possible to tie the lower chords with collars, accomplished by a twenty-armed bolted-timber armature that avoided problems of intersection (Fig. 70). The feet of the ribs are seated on cast-iron brackets, which project from a timber wall plate that in places is strengthened by iron beams, and which is variously carried on timber squinches, flitched beams and brick walls. This complex 'flying wall plate' construction seems to have been designed to counteract, or safeguard against, the spreading of the timbers.



Fig. 68 Photograph showing the east (Steine) front of the Brighton Pavilion in the 1880s, with the tented Banqueting Room and Music Room to left and right respectively. (Historic England Archive, ref. al0322_057_01)



Fig. 69 A cross-section from John Nash's *The Royal Pavilion at Brighton* (1827), showing the building as remodelled to his designs in 1815-22. Many of the details of construction resemble that of the Rotunda – especially the tented Banqueting Room and Music Room, at each end of the east (Steine) front. (© The British Library Board, 557*.h.19, p. 28)



Fig. 70 View towards the apex of the laminated timber roof over the Music Room at the Brighton Pavilion. The inclined members are the array of upper struts, joining the upper and lower chords.
(© Historic England, Derek Kendall)

The most surprising difference between these structures and their prototype is the absence of members connecting the lower and upper chords. Each half-rib has just two posts. The upper, which is accessible to view, is of doubled form, like in the Rotunda, with timber bridging pieces between. This paucity of web members is possible because the laminated upper and lower chords were considerably stronger, made up for the most part of five thicknesses of closely fitting planks. Only in the higher part of the upper chords did they reduce in thickness to three planks. Consequently, the laminated chords are better equipped to resist bending, with less need of support along their length. Unlike in the Rotunda, the planks were cut to the required curve and, it is worth noting, the overall quality of carpentry is greatly superior, reflecting the permanence of the structure.

Perhaps Nash placed greater reliance on the inherent strength of laminated timber chords, rather than trussing, because he had seen William Porden's remarkable Brighton stable block. Erected in 1804-8, this 80ft-diameter dome was framed using twenty-four vertically laminated timber ribs each measuring just 12 inches by 9 inches at the bottom, diminishing to 9 inches square at the top (Fig. 71). Porden, a pupil of James Wyatt and a friend of Nash, had based his design on the celebrated dome of the Halle au Blé (Corn Exchange) in Paris.⁴⁸² That structure, erected in 1782-83 by master cabinet-maker A. J. Roubo to designs by J. G. Legrand and J. Molinos, was itself the first major example of the technique in over two centuries, reviving and improving methods pioneered by Philibert de L'Orme (c. 1510-70).⁴⁸³ The acclaimed French dome even inspired Thomas Jefferson to give his home, Monticello in Virginia, a laminated timber dome in c. 1800, thereby introducing the technique to America.⁴⁸⁴

Nash himself never got to see the Halle au Blé during his only recorded visit to Paris in 1814, as it had already burned down. He did, however, see and admire its replacement, a virtual facsimile in cast iron, and it is tempting to think this might have inspired the elaborate iron structure framing the Pavilion's centrepiece, the great dome over the Saloon (see Figs 68-69).⁴⁸⁵ Curiously the drawings for this, like so many of the others held at Brighton, are not signed by Nash, but carry the words 'Drawn by William Nixon, 1827' in the corner. Could this be the Nixon discussed above, in his final months, or else Nixon junior, putting the record straight?



Fig. 71 The central rotunda of William Porden's Riding School and Stables, built 1804-8, as illustrated in John Nash's *The Royal Pavilion at Brighton* (1827). This dome was probably the first large-scale use of laminated timber in Britain. The building was converted for public use, incorporating a museum, gallery and concert hall, in 1867-73 and is now named 'the Dome'. (© The British Library Board, 557*.h.19, p. 26)

ROTUNDA AND PAVILION: REGENCY STRUCTURAL INNOVATION

The early nineteenth century was a highly experimental period in the history of building technology – not just in terms of iron construction, which was taking bold strides, but also in timber engineering. The Rotunda, or Polygon Room, embodies a number of progressive strands in late Georgian structural carpentry. Techniques of timber lamination, of specialised trussing, and of three-dimensional framing were all harnessed to create a new type of roof structure, the freestanding catenoidal enclosure. To this end, Nash and Nixon seem to have drawn on the somewhat abstract example devised by Nicholson, but in taking its guiding principles into the real world, they contrived their own technique of binding the whole structure.

The similarity in the trussing arrangement of their half ribs to that depicted by Benjamin Asher in 1811 is palpable. However, independent invention spurred by similar circumstances is more likely than any westerly transatlantic transmission of ideas. According to David Yeomans, New England carpenters adopted the divided tie-beam truss largely because their churches and meeting houses were timber walled, and hence unable to withstand the outward thrust of low-pitch roofs. Similar conditions prevailed briefly in the grounds of Carlton House, where a suite of panel-walled structures was erected. Only one of these still survives – the Rotunda – but, besides Brighton, Nash and Nixon's innovative tent room may have produced further offspring, such as the Tent Room of St Dunstan's or Hertford Villa in Regent's Park (1827) (Fig. 72).⁴⁸⁶ Designed by the young Decimus Burton (1800-81), a protégé of Nash, this freestanding convex enclosure was used by Lord Hertford, 'the Caliph of



Fig. 72 The south front of St Dunstan's Villa in Regent's Park, London, designed by Decimus Burton in 1825 and destroyed by fire in 1936. On the left of the main house is the self-supporting quadrilateral tent room of 1827. Inspired by the Brighton Pavilion, this probably used carpentry techniques pioneered by John Nash at Carlton House, and marked the end of the line for Regency tented structures. (Courtesy of the Architectural Association Library)

Regent's Park', to stage 'his extravagant and costly entertainments on a scale that only crowned heads could afford'.⁴⁸⁷ Unfortunately, Burton's surviving drawings do not show the structure, but it probably relied on divided tie-beam trusses, if not laminated timber.⁴⁸⁸ Other comparable structures were probably built in this decade, but thereafter Victorian sobriety most likely saw the demise of the quirky, semi-permanent tent room, and with it a particular strand of timber engineering.

PART THREE: LANDSCAPE - SARAH NEWSOME AND SUSAN SKEDD

THE LANDSCAPE SETTING OF THE WOOLWICH ROTUNDA, 1818-1945

The Early Landscape and the Establishment of the Repository Grounds

By the end of 1818 when the dismantled Rotunda arrived in Woolwich, a purpose-built military training landscape already existed to the west of the new barracks. Two maps, one surveyed by Lt Peter Couture RE and one by 'gentlemen cadets', both dating to about 1788, show the agricultural landscape which had existed just thirty years previously, enclosed fields, some with light tree cover, suggesting a mixed landscape of arable cultivation and pasture.⁴⁸⁹ The land was on the eastern edge of Hanging Wood and may have been attached to 'Mr Bowater's Farm', marked on the above plans at the crossroads where Artillery Place and Repository Road meet.

As has been shown earlier in this report (see pp. 52-3 and p. 65), the Royal Military Repository was founded by William Congreve the elder (1743-1814), Commandant of the Royal Military Repository and Superintendent of Military Machines. It was created as a 'school of methods of mounting and dismounting ordnance' and was equipped with a stock of weapons, instruments and models for teaching purposes.⁴⁹⁰ Though the institution was founded in 1778, it is not clear at exactly what date the Repository Grounds were acquired. It is possible that this land first became available for artillery use after part of the Bowater Estate was leased by the Board of Ordnance in 1773, though the Repository Grounds are not included in what appears to be the associated survey.⁴⁹¹ It was also in 1773 that Nathaniel Pattison (brother of General James Pattison) 'rendered to the Board a part of his Estate opposite to the South Part of Woolwich Warren for the purpose of erecting Barracks'.⁴⁹² Two years later, James Pattison suggested to the Board of Ordnance that he carry out some experiments using Congreve's artillery exercises in another portion of his brother's lands in Woolwich. He wrote:

in my Brother's Sand Pitts near the Warren is a great variety of unequal broken ground, furnishing many different inclined plans, even to perpendicular ones, or precipices, as also some suitable ravines, or hollow ways, where we might have an opportunity of trying many Experiments, which I humbly conceive would be instructive both to Officers and Soldiers, and may in a future War prove advantageous to His Majesty's Service.⁴⁹³

This might suggest that the area that later became known as the Repository Grounds was not available for exercises until at least 1775. The sandpits were located to the east side of the barracks, but it is not known whether Pattison attempted Congreve's exercises there.⁴⁹⁴

In his *History of the Royal Regiment of Artillery* (1872), Major Francis Duncan notes that the Repository Grounds were later (though no date was specified) given over 'solely for instruction in the management of heavy ordnance but when it was first

opened, the sharp turns and steep inclines of the Repository Grounds were made use of in training the drivers to turn and manage their horses'.⁴⁹⁵ The 1788 maps do not show evidence of any immediate alterations to the landscape in the early days of the Royal Military Repository and the main focus of activity appears to have remained at the Warren in this period.

The First Buildings, 1781-1806

The first buildings on the site were four long sheds used for storing guns and carriages, and a guard house or gatehouse by the original entrance to the Repository Grounds in the south.⁴⁹⁶ Map evidence shows that the field boundaries had been removed and the four 'Repository Sheds' were in place by 1803 (Figs 73-74, and see Fig. 28).⁴⁹⁷ These buildings were paid for by part of the £80,000 granted by the Ordnance in 1802 and 1803 to fund the replacement of what had been lost in the fire at the Warren (where the Repository was initially established) in 1802.⁴⁹⁸ The guard house and the stepped boundary wall to the east were added by 1806.⁴⁹⁹ The latter is depicted differently to other boundaries on both the 1808 and 1810 maps.⁵⁰⁰ It is suggestive of a fortified boundary pre-dating the later fortification and possible embrasures, and artillery pieces are depicted along its length in a similar manner to the training earthworks within the woodland (see below). However, there is no mention of any earlier fortifications in a letter written by Congreve in 1818, in relation to the construction of the later earthwork, and any surviving remains are likely to have been buried by the later developments of the Rotunda and Napier Line compounds.⁵⁰¹

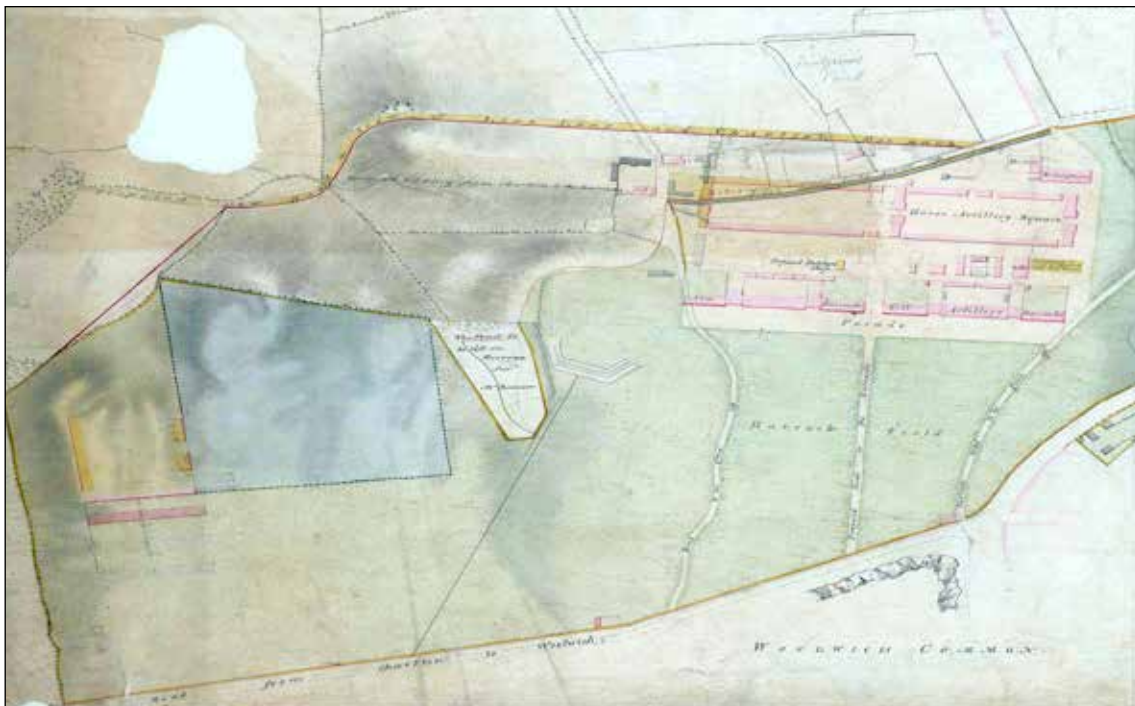


Fig. 73 Map of Woolwich and Charlton Commons, 1803, prior to the erection of the Rotunda. The first two Repository Sheds, long narrow blocks to the south-west of the Repository Grounds, are shown in pink at the left of the image; two more would be added to the south in the same year. (The National Archives, ref. MPHH 1/180)

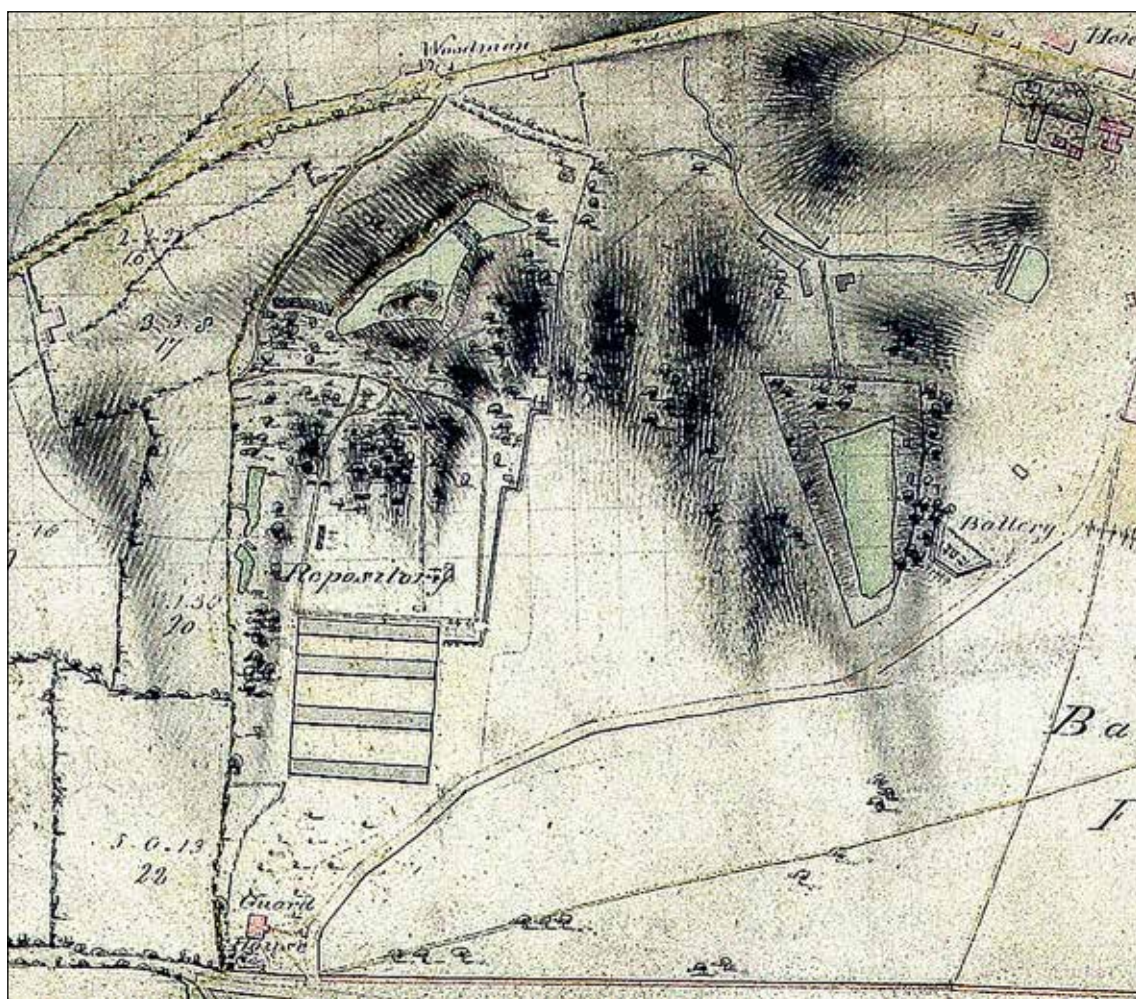


Fig. 74 Extract from map of 1808 showing, on the left, the Repository Sheds, guard house or gatehouse, the eastern boundary with guns apparently in position, the newly created pond and various structures related to training scattered within the woodland. (The National Archives, ref. MPH 1/189/4)

Landscaping for the Exercises, 1806-1830

The natural topography of the Repository Grounds, with its contours and woods, provided the ideal terrain for the Repository exercises. These exercises were based on the experiences of William Congreve the elder whilst serving as a captain in the Royal Artillery and in Canada during the Seven Years' War (1756-63; see p. 52).⁵⁰² The exercises that Congreve devised in 1774 involved manoeuvring:

Field Pieces over Ditches, Ravines, Inclosures or Lines ... To mount or dismount heavy Guns, when no Gyn is at hand; to get the Guns on Batteries with a far less number of Men than are usually employed in drawing them upon their platforms by bodily strength only. To raise any Carriages that may be overset on a march etc.⁵⁰³

These exercises, as Major J. P. Kaestlin has observed, involved 'a school of ingenuity in the application of mechanical principles' and instruction in the effective use of 'ropes, pulleys, levers and gravity' to move the ordnance over obstacles, an observation borne out by a series of photographs taken around 1860 which document the exercises (see, for example, Figs 78-79).⁵⁰⁴

Map evidence appears to suggest that major landscaping in the Repository Grounds, such as the creation of the ponds, took place between 1806 and 1808, presumably for the purpose of simulating the type of terrain over which heavy ordnance might need to be transported. By 1808 the largest pond had been created as well as two smaller ponds to the south, whose locations are visible today as a wide and deep trough in which the current stream runs (Fig. 75, and see Figs 29 and 76).⁵⁰⁵ A bridge is apparent crossing the largest pond and the island is also visible. By 1815 a process of enlarging the main pond was in progress,⁵⁰⁶ and between 1815 and 1830 the two smaller ponds visible today were constructed, as was a pond located at the northern end of the Repository, which had been infilled by the mid-nineteenth century but is still evident as a slight depression.⁵⁰⁷ There is an early reference to the ponds being used for military exercises in E. W. Brayley's *The Beauties of England and Wales* (1808), in which he states that 'on the west side of the Barracks is a piece of water where experiments with gunboats, &c., are occasionally made'.⁵⁰⁸ It seems unlikely that these would have occurred on the pond 'left in reserve for Mr Bowater' so it is likely that the piece of water referred to is the largest of the Repository Ground ponds.⁵⁰⁹

Maps of 1808 and 1815 (see Figs 74 and 75) show other significant developments, including the construction of a network of paths and tracks around the grounds and features which represent batteries or other artillery training structures, such as the earth and wood casemate shown in later photographs.⁵¹⁰ Another proposed change in 1815 was an unexecuted scheme for the conversion of the northernmost repository shed to a model room; this scheme became redundant when the Rotunda was moved to the Repository Grounds three years later. Correspondence between the Office of Ordnance and the Royal Engineers between 1805 and 1810 contains a number of references to platforms and other structures which were almost certainly built within the Repository Grounds; for example, a letter from R. Crewe concerns an estimate for 'platforms being demanded for the practice of artillery at Woolwich'.⁵¹¹ Part of these developments was a section of ditch and bank presumably constructed for Repository exercises located immediately to the south-west of the largest pond. The trench, nearly 30m in length and well over 2m in depth, survives as a substantial earthwork in the Repository Grounds (Fig. 76). It can be seen on a 'Plan of the Royal Artillery Barrack Grounds', by C. G. Grey in 1839 (Fig. 77), and on a 'Map of the Woolwich District' in 1845 (see Fig. 19).⁵¹² It is tempting to see this feature as the experimental work with earthen 'piste' that Congreve the younger mentions (see below). Many of the tracks and paths created within the Repository Grounds are either still in use as modern tracks, or are visible as earthworks running through the woodland.

At the start of the nineteenth century Woolwich provided the perfect demonstration of Britain's growing military strength. Correspondence which discusses the merits of a wall or fence versus a bank and ditch boundary at the northern side of the Repository appears to highlight the importance of displaying the professionalism of the Repository exercises to the public.⁵¹³ Woolwich was already becoming part of a long tradition of showing off military activities and facilities to members of visiting royal families. In June 1814 the Prince Regent invited the Allied Sovereigns to the Royal Military Repository as part of their visit to Woolwich (see p. 8), hence the importance of the landscape even before the Rotunda arrived.

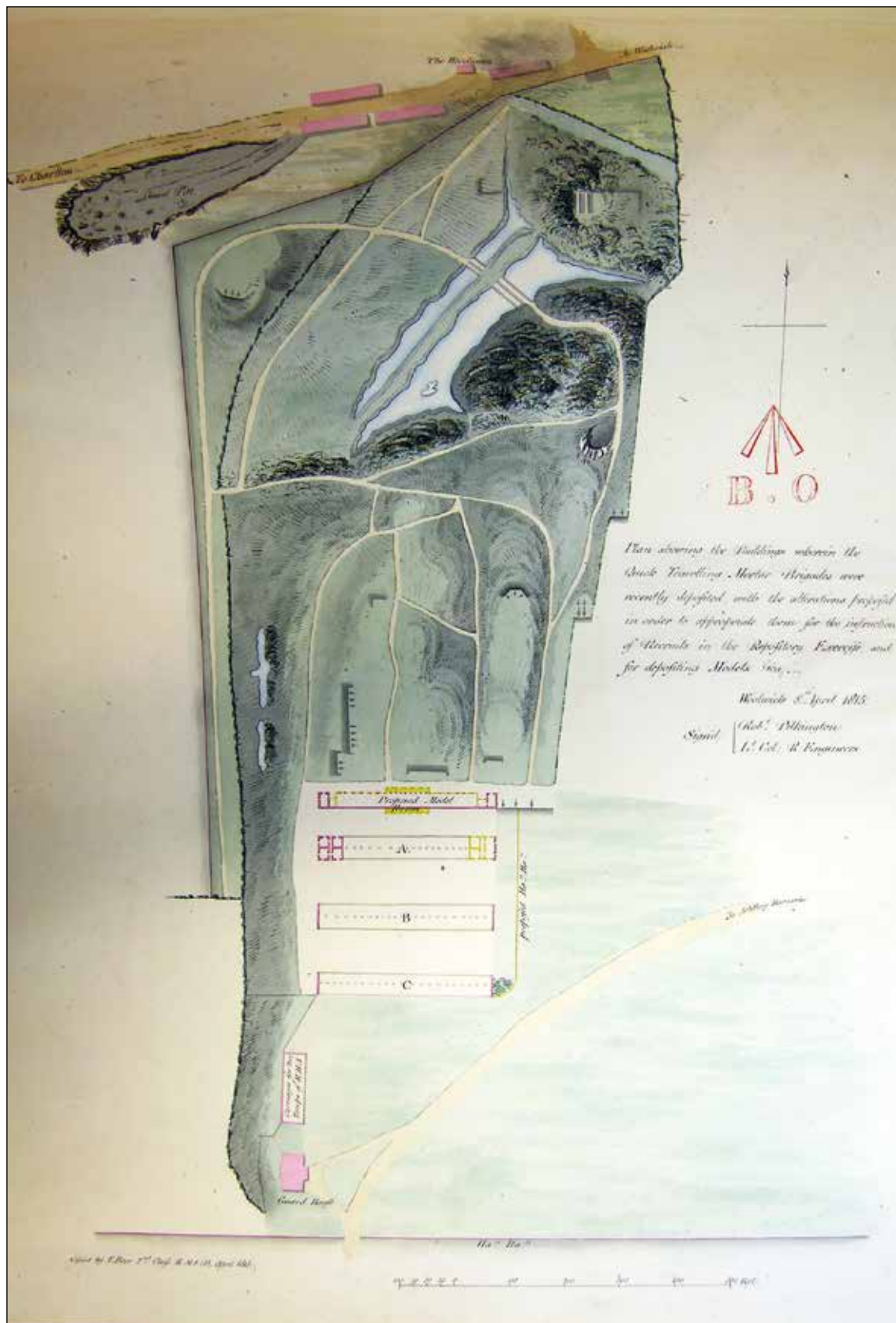


Fig. 75 Plan of April 1815 showing the landscape of the pre-Rotunda Repository Grounds, with woods, paths and ponds. The main pond appears to have been enlarged at around this time. (The National Archives, ref. MPH 1/507/3-4)



© Historic England

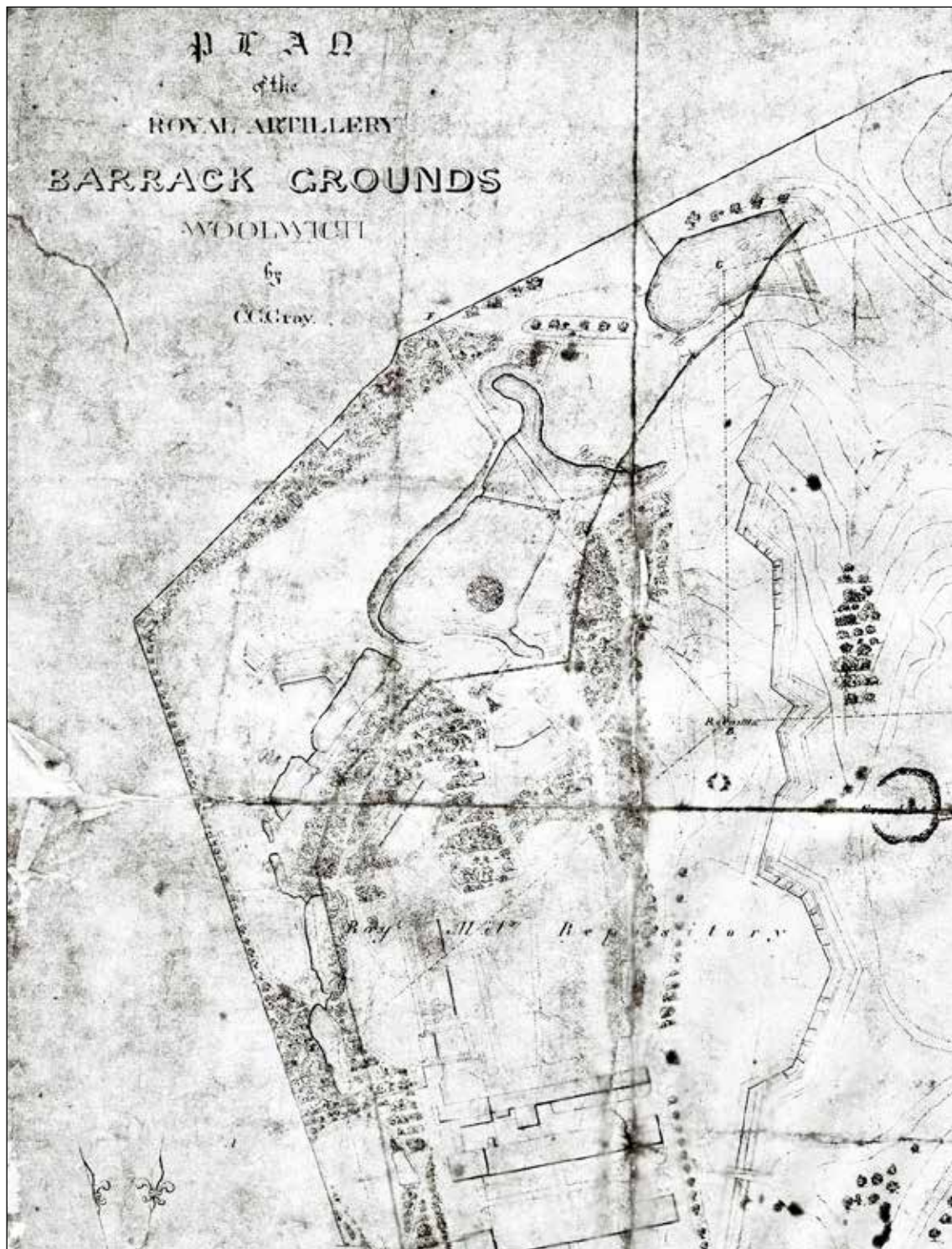


Fig. 77 Plan of the 'Royal Artillery Barrack Grounds' (the Repository Grounds), Woolwich, by C. G. Gray, 1839. The Rotunda is clearly shown, at the centre right, with the linear fortifications to its east (left). (Historic England Archive, ref. md96_00924)

The Rotunda's Location in 1818

As has been discussed elsewhere in this report, the dismantled materials of the Rotunda arrived at Woolwich on 14 November 1818, and on 7 December 1818 the Commanding Engineer at Woolwich – Lieutenant-Colonel John J. Jones – was asked ‘to make the necessary arrangements for its erection on the brow of the Hill at the eastern boundary of the Repository Grounds, that spot being the most convenient as well as the most picturesque situation for it’ (see p. 56).⁵¹⁴ The position chosen for the Rotunda ensured that it occupied a prominent, eye-catching site overlooking Woolwich Common – looking west from the parade ground in front of the Royal Artillery Barracks gave a view of the Rotunda beyond the mortar battery and firing range, backed by the woodland of the Repository Grounds, and the building would also have been visible from the Royal Military Academy (see Figs 19, 28 and 31). The Rotunda's picturesque backdrop was later interrupted by the brick-built observatory building – first home of the Royal Artillery Institution – which was built to the east of the Rotunda during the late 1830s (see Fig. 86).

Congreve's ‘fortification’, 1818-c. 1850, and its Survival

At the same time that Congreve the younger took possession of the dismantled Rotunda and asked for it to be reassembled in the Repository Grounds, he also requested that the surrounding land be remodelled into a series of revetments in order to create a training landscape for the Artillery and Engineers to be instructed in field manoeuvres. In his letter to the Board of Ordnance of 7 December 1818, Congreve specified the features that he would like the Engineers to create:

I beg at the same time to request, that the Commanding Engineer may also be desired to make the necessary arrangements for the formation of a Section of regular fortification, with Scarp and Counterscarp, Wet Ditch, Glacis and approaches in the Bottom of the Repository Ground, with such additions as may be found necessary to carry on a complete course of instructions in all that relates to the practice involved in the defence and attack of such a work, passing the Ditch, escalading etc.⁵¹⁵

Congreve was confident that these features could be made out of ‘Piste or rammed earth, instead of Brick’, as he had demonstrated in an experiment carried out in the Repository – perhaps the origin of the Repository Ground trench described on p. 119. This construction method is visible on the watercolour by G. B. Campion of around the mid-1860s (see Fig. 31), where earth sods are shown laid carefully like bricks, and on a later photograph apparently taken in 1868.⁵¹⁶ All available images show the internal face of the earthwork and its embrasures revetted in brick and, although technically possible, it is unlikely that the brick was not part of the original construction.⁵¹⁷

As a consequence of using ‘piste’ rather than brick, Congreve believed that the cost of such earthworks would not exceed £500, for the principal expense would be the labour of the Engineer Corps. Rammed earth absorbed shot better than brick, but

this probably had less bearing on Congreve's decision than comparative cost.⁵¹⁸ He added that having discussed his plans in detail with the Clerk of the Ordnance 'on the spot', he had persuaded him of the importance of creating these mock fortifications. Congreve concluded that this training landscape 'seems the only thing wanting to make this Establishment the most complete school of practical military instruction, that does exist – or, I believe I may venture to say, that can possibly be devised'.⁵¹⁹ His arguments clearly convinced the Board of Ordnance, who approved the works two days later, on 9 December 1818.

Work was postponed on these fortifications at least until early 1820, as priority was given to re-erecting the Rotunda.⁵²⁰ By the time that the Rotunda was handed over to Congreve in May 1820, however, the earthworks seem to have been started by the Engineers. Certainly, the earliest known illustration of the Rotunda in situ at Woolwich – a drawing by R. W. Lucas published on 1 June 1820 (see Fig. 21) – depicts guns sited along a wall immediately to the east of the Rotunda, though this could be the pre-Rotunda boundary. A map dated 1821, drawn to accompany John J. Jones's inventory of the Ordnance buildings at Woolwich, shows only a spur of wall bounding the Rotunda to the south and again this may be related to a pre-existing boundary, as it appears in a different position to the later fortification (see Fig. 28).⁵²¹

Correspondence between the Office of Ordnance and the Engineers around 1824 may describe the construction of various elements of the new fortification.⁵²² By 1830, when Jones carried out the next survey of Ordnance buildings, the full line of fortifications enclosing the Repository Grounds to the east and south is clearly marked and indicates the relative complexity of the southern section, with the two large bastions, compared to the northern section (see Fig. 77).⁵²³ The fortifications may also have differed in scale between the two sections, as seen on the 1844 print (see Fig. 23), though later photographs and maps show that the greater number of embrasures is the most notable difference between the southern and northern sections (see Figs 30 and 32). This difference may reflect the aesthetic, rather than practical, role of the fortifications very close to the Rotunda or perhaps, more mundanely, the need to accommodate different types of ordnance. The fortification followed the original boundary wall of the Repository Grounds and provided a practical, as well as dramatic, setting for the Rotunda, further establishing its permanence within the Woolwich landscape. A number of illustrations show cannons mounted at the embrasures though it is likely that not all the line was armed in this way, as most of the picturesque views focus on the Rotunda. A large number of photographs taken from 1858 onwards (held by the Royal Artillery Museum and the Royal Artillery Historical Trust) show in great detail the internal faces of the fortification and the variety of artillery mounted along the line. These include gun positions with and without embrasures, with hard standing or with platforms and rails for moving carriages, and for various types of cannons and mortars (Figs 78-79).⁵²⁴

The original entrance into the Repository, through the line, was to the south of the Rotunda, framed between the two more elaborate and regular bastions, marked on Lieutenant Colonel John Bayly's map of 1867 as 'South bastion' and 'North bastion'



Fig. 78 A photograph taken in 1858 by John Spiller showing a 10-inch gun on a 'naval slide' positioned at the point of the southern bastion. The ground has been raised in this location in order to enable the gun to clear the parapet. The Rotunda is just visible to the left of the photograph. (Courtesy of the Royal Artillery Historical Trust, ref. AL933/15)



Fig. 79 Photograph probably taken in 1858 by John Spiller showing the southernmost bastion of the training fortification in the Repository Grounds. (Courtesy of the Royal Artillery Historical Trust, ref. AL27/25)

(Fig. 80, and see Fig. 30).⁵²⁵ By the time that Campion painted his watercolour of the Rotunda (c. 1865), what appears to be a wooden bridge had been built across the ditch in the same position as the current entrance immediately to the south of the Rotunda (see Fig. 31). Late nineteenth-century maps document the earthwork's construction in detail, depicting a flat-topped bank revetted internally by a wall, with a small berm and then a ditch on the outer side.⁵²⁶ Beyond the ditch is a feature which may be a fence boundary or track. In some sections the internal face was also revetted by a low earthen bank as well as the brick wall.⁵²⁷ It is likely that the berm or step suggested by the map depiction has been lost because of the sod material eroding and slumping.

Today only the northern half of the earthwork survives above ground. It stretches from the modern entrance into the Napier Line compound, on a roughly north-south alignment, to the current entrance to Repository Woods, the point at which the earthwork originally terminated. Between the entrance to the Napier Line compound and the Rotunda compound, the remnants of one of the larger bastions is preserved as an earthwork platform. Slight undulations on top of this may relate to the buried remains of the numerous embrasures and emplacements shown in this section of the fortification on historic maps and photographs.⁵²⁸

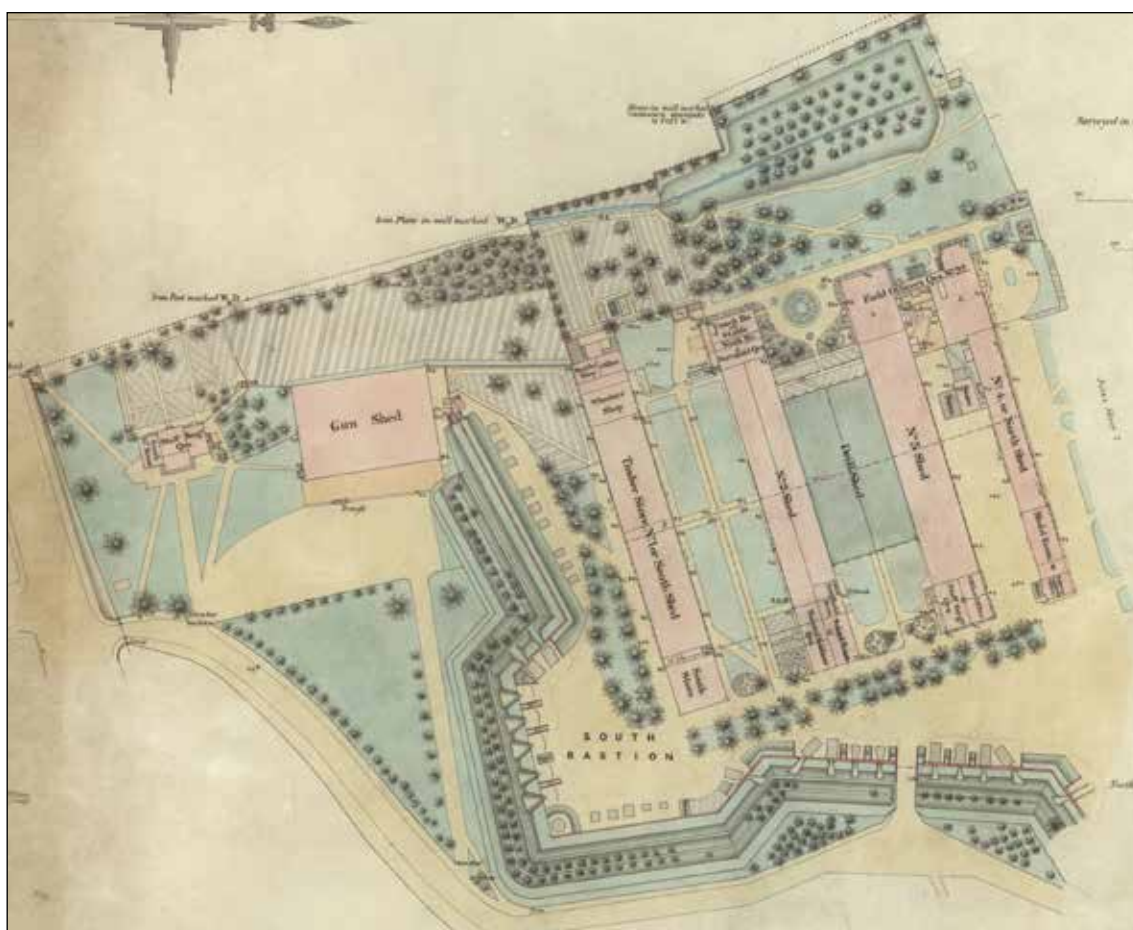


Fig. 80 Plan of the Royal Military Repository, taken from a survey by Lieutenant Colonel Bayley and Colonel Sir H. James, dating from 1867-81 (see also Fig. 30). This part of the plan shows the layout of the Repository Sheds and the southern bastions. (The National Archives, ref. MPH 1/362/5)

To the north, the earthwork defines the eastern side of the Rotunda compound and is topped by a stock brick wall with iron fencing (Fig. 81). It is not clear whether the wall was part of the original revetment but its sloping angle close to the Rotunda compound may suggest that it was, and that it now appears perched on top of the earthwork due to erosion of the outer bank (which may have been deliberately slighted in order to fill in the ditch). This section of the fortification appears to have been constructed after, though perhaps not very long after, the bastion was constructed to the south. This may indicate phasing in the construction of different sections of the earthwork – possibly supported by the depiction on the 1821 map – but this should be treated with caution as many changes have occurred in this area, including the insertion of the current access into the Rotunda compound between 1839 and 1869.⁵²⁹



Fig. 81 The Rotunda seen from the north-east in 2008. The largest remaining spur of the linear fortification creates a visually dramatic setting for the building. (© Historic England)

To the north of the Rotunda compound entrance the fortification is defined by an east-facing scarp which forms a variety of flanks, salients, spurs and demi-bastions which are much more irregular than the two large bastions that existed to the south. It is possible that this irregularity was purposeful but it may have been influenced either by the position of the Rotunda or possibly the earlier boundary described above. The brick wall and iron fence continue though it is clear that some sections of wall, such as that to the north of the Rotunda, have been rebuilt with twentieth-century brick.

The most substantial section of remaining earthwork is probably the spur which is located immediately to the east of the Rotunda building, reaching a height of 5m, and this may be no coincidence, though erosion in other areas must be considered. If constructed after the building was relocated here, then this stretch of the line probably had more of an aesthetic than a practical training function, and was designed to frame the Rotunda when viewed from the east. It is worth noting that the Rotunda appears to sit on a large platform which is as high as the fortification, on top of its reverse (western flank), though again it must be cautioned that much alteration has occurred in this area.

Continuing northwards, the height of the earthwork diminishes but the very slight remains of an outer ditch are visible. The ditch seems to disappear at the southern end under the main scarp of the line close to the northern end of the Rotunda compound. Different construction phases appear to be evident in the earthwork at a number of points along this section, some of which are suggestive of recutting or rebuilding in some locations. On the western side of the boundary wall the earthwork has been disturbed by later Second World War trench digging but short stretches of the internal revetment bank can be identified. Similarly, stretches of the revetment bank can be identified within the Rotunda compound, but again it is not clear to what extent the earthworks in this area have been remodelled.⁵³⁰

Any landscaping relating to the glaxis and approaches is likely to have been significantly affected by the construction of the road immediately to the east of the Rotunda between the mid-1840s and 1869. A map of 1839 shows tree or scrub cover on the approaches, perhaps reflecting the importance of the earthwork in the Repository exercises rather than for attack practice, though the proximity of the vegetation to the Rotunda may suggest it had an aesthetic function (see Fig. 77).

The Repository Grounds in the Nineteenth and Twentieth Centuries

Once the Rotunda opened to the public in 1820, the Repository Grounds fulfilled the dual role of providing pleasure grounds for both military and civilians and presenting a suitable landscape necessary to bring to fruition the elder Congreve's ambition of creating 'the most complete school of practical military instruction', setting the standard in military education. The earliest known illustration of the Rotunda – R. W. Lucas's print, published on 1 June 1820 (see Fig. 21) – shows the Rotunda open for business, with its door thrown open to entice in the visitors strolling along the path leading up from the Repository Woods. Demonstrating both the growing professionalism of the Army and the military might of Victorian Britain, it is likely that the Repository Grounds were made deliberately accessible to the

public, in a merging of military and civilian spheres which was seen much less often in the twentieth century.

However it was training that created – as a by-product – the picturesque landscape and which was responsible for bringing the Rotunda to Woolwich. In the introduction to the first catalogue of the Rotunda, published in 1822, the younger Congreve set out the aims of the Royal Military Repository:

The immediate objects of the instruction of this Institution are the different modes of passing Rivers, Ravines, Ditches, Narrow Roads, Precipes, Morasses, and other such obstacles, by Field Artillery; with the embarkation and disembarkation, the mounting and dismounting, both Light and Heavy Ordnance; shewing all the various expedients by which the heaviest Guns and Mortars may be landed and moved, where Cranes, Gyns, or other regular mechanical means are not to be obtained.

To this also is added the Construction and Laying of Military Bridges, Scaling Ladders, and in short everything that can occur in the most difficult service, and which does not fall within the regular Field or Garrison Practice of Artillery; cases of difficulty which, previous to the formation of this Establishment, seldom came within the observance either of the officer or soldier; until in actual service he was called upon to overcome them, and could not therefore be prepared with the best and readiest means.⁵³¹

There is no doubt that during the years 1820 to 1859 the Repository was used exactly as intended by the elder Congreve – both the Rotunda and the designed military landscape surrounding it were fully utilised by the Artillery, as is clear from numerous contemporary accounts (see also p. 77). A typical description of the Repository was provided in an article published in the *Saturday Magazine* in December 1838:

[The] Rotunda or Repository ... contains numerous items of curiosity and interest relating to the defence of the kingdom. The space surrounding the building is tastefully laid out in formal walks and parterres, and contains within its enclosure, all the requisite for the instruction of the artillery in the practice of their formidable mode of warfare. Here are model rooms containing drawings and models of implements of war, workshops in which experiments are made and new models constructed, and in the open air different kinds of fortification are erected by the students, and all the details of the management of artillery are put in practice for the purpose of instruction, near an artificial fortification constructed of earth. On the left hand as you enter the grounds the method of loading and firing the larger kind of ordnance, used in fortified places, is taught with all the attention to minutiae which would be practiced in the case of a siege.

The ground near this spot is beautifully diversified and unequal in its surface, and interspersed with several pieces of water; this condition of the ground affords excellent practice to the men, in dragging the guns up steep acclivities, or lowering them down rapid descents, turning pontoon bridges to transport them over water, and imitating all the operations of actual war.⁵³²

In 1844, *The Visitor's Guide to the Sights of London* described the use of the Royal Military Repository in similar terms: 'The appearance presented on a near approach to the grounds of the Repository is that of a regularly constructed fort, with guns placed in the embrasures. The gunners and drivers of the Royal Artillery practice the art of defending fortifications, slinging guns or gyns, throwing pontoons, or floating bridges, across a small lake to an island in the centre, and various other duties connected with their branch of the service in this department'.⁵³³ Three years later, Robert Sears noted that 'The ground around the building [the Rotunda] is much broken, and intersected with two or three pieces of water, which afford the Artillery corps opportunities for the practice of many manoeuvres likely to be brought into operation during war. Embankments and fortifications have also been constructed, mounted with various species of ordnance employed in the defence of besieged places, at which the men are exercised. They are often directed to form pontoons across the ponds, and practised in the methods adopted for the raising of sunken guns, &c'.⁵³⁴

Repository exercises continued to be taught in this location until at least the end of the 1850s, and in 1858 the Artillery turned to the new medium of photography to record these exercises. The pioneering photographer John Spiller (1833-1921) was working as a chemist in the Royal Arsenal when he was commissioned to produce an album of photographs to illustrate 'the successive operations gone through in working heavy ordnance' as an aid to instruction at the Royal Military Repository.⁵³⁵ Two albums of photographs held in the collections of the Royal Artillery Museum appear to contain Spiller's images, some of which are signed, whilst one group are not attributed to Spiller but seem to show exactly the steps involved in the Repository exercises – demonstrating the various stages of, for example, 'Field gun drill: Armstrong 12 pounder BL' or 'Rocket Drill' (Fig. 82).⁵³⁶ The images show cadets in the process of: mounting ordnance next to the training line, manoeuvring ordnance using sheerlegs, gyns and derricks, crossing the ponds using bridges and pontoons and learning how to build temporary bridges (Fig. 83). They also show the Repository Grounds in great detail and most can be located on the ground today or identified on Bayly's 1867 map (see Figs 30 and 80).⁵³⁷ It is interesting to note that none of the photographs in these particular albums show the Rotunda, perhaps reflecting their practical focus. It has been suggested by J. P. Kaestlin that – in contrast to Congreve – Colonel Williamson and Colonel Paterson, as serving officers of the Royal Artillery, 'were chiefly concerned with devising new courses and hence with outside activities', which underlines the fact that the Repository was as much a training institution as a museum during this period.⁵³⁸

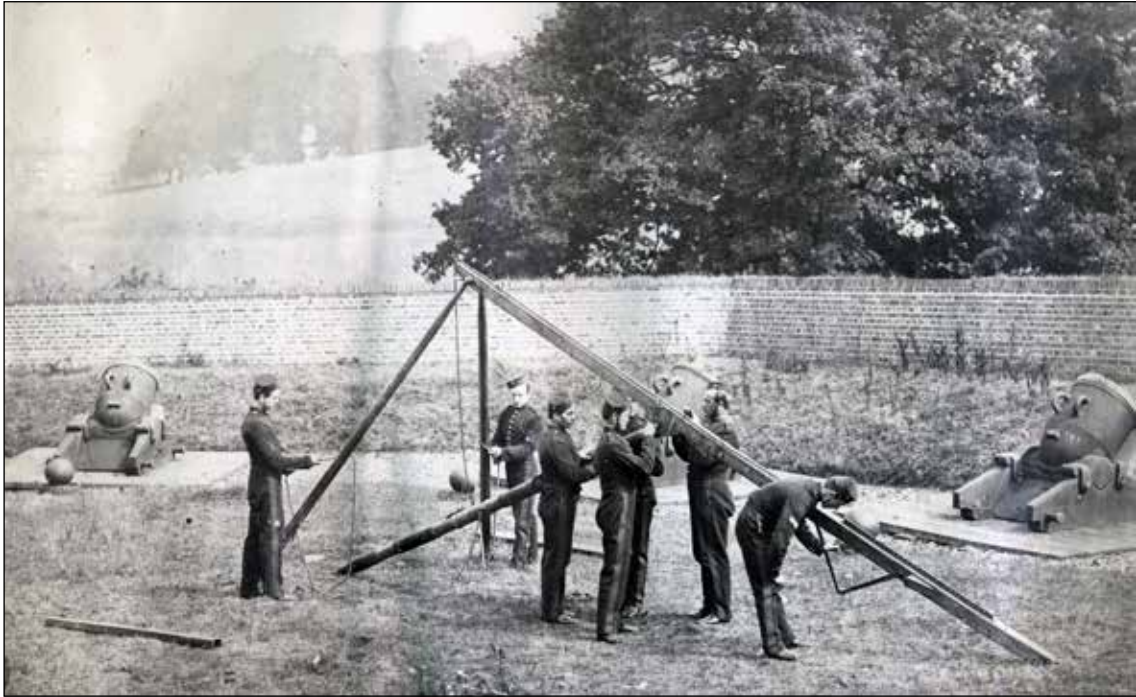


Fig. 82 Cadets performing 'Rocket Drill' on a stretch of the linear fortification to the north of the Rotunda, with the slope of Green Hill in the background. The photograph was probably taken by John Spiller in or soon after the year 1858. (Courtesy of the Royal Artillery Historical Trust, ref. AL27/34)



Fig. 83 A photograph probably taken by John Spiller, c. 1858, showing a temporary bridge across the Repository ponds. It illustrates the picturesque character of the grounds. The summerhouse just visible on the left was depicted in George Scharf's painting of 1826 (see Fig. 22). (Courtesy of the Royal Artillery Historical Trust, ref. AL112/23)

The 1826 watercolour by George Scharf (see Fig. 22) demonstrates not only the Repository exercises but also the area's multiple roles of training, recreation and even the grazing of cattle. Couples stroll and sit, whilst cadets are in the process of mounting cannon, marching, and hauling an artillery piece across the large pond, an activity which apparently claimed the life of one cadet in 1830.⁵³⁹ The main bridge across the pond appears to be a pontoon-style construction (though it is described as a 'trestle bridge' on later maps) whilst two smaller bridges are visible, one at the north-eastern corner close to the modern dam and one to the south-east corner over a channel carrying water into the pond. Photographs of various types of bridge construction were also taken by Spiller and they were probably dismantled and reconstructed regularly. This is underlined by the nearby 'Bridge Store' which is shown on Bayly's map (see Fig. 30).⁵⁴⁰ By 1839 a second bridge had been constructed and by 1869 the pontoon style bridge had been removed.⁵⁴¹ The stone foundations of an earlier bridge or dam appear to be visible at the eastern side of the lake and paths lead up to the Rotunda which, on the skyline, is the central focus of Scharf's sketch. The path climbing upwards to the Rotunda may be that seen emerging on the Lucas view of 1820 (see Fig. 21). It is also worth noting the semi-circular summerhouse to the south of the main pond on the Scharf view – yet another indicator of the dual use of the Repository Grounds (see also Fig. 83). T. M. Baynes's two views of 1822 and 1823 showing visitors outside the Rotunda make clear that it was a place of resort for both military men and civilians, gentlemen and ladies, and children. Though both views are to the east, rather than in the Repository Grounds, they emphasise the picturesque nature of the Rotunda's location with views to the Thames beyond (see Fig. 85), as do later photographs.⁵⁴²

The construction of the Royal Artillery Institution's observatory building to the east of the Rotunda in 1838-9 (extended 1852-3) added yet another important element to the suite of training and educational facilities that had developed in the Royal Military Repository (see Figs 19 and 86). It is not clear exactly why the observatory was located next to the Rotunda, but given the Institution's wish to 'generally further the education of artillery officers', this juxtaposition with the Rotunda may have been intentional.⁵⁴³ Trees and shrubs seem to have screened its visual impact on the Rotunda's setting. A few years later, in 1844 or 1845, Sir Francis Chantrey's square stone memorial to Major-General Sir Alexander Dickson (d. 1840), Wellington's right-hand man during the Peninsular Campaign, was erected almost due south of the Rotunda (see Figs 23 and 31).⁵⁴⁴

The practical function of the Repository is apparent in a coloured sketch drawn 'by aid of the Pocket Sextant' by C. Stratford of the Royal Military Academy (see Fig. 32). The drawing, which is undated but was probably executed between 1845 and 1861, delineates the whole of the Repository Grounds, with its contours, ponds, sheds, gun emplacements and, of course, the Rotunda. The sketch also depicts many of the tracks that survive as earthworks in the Repository Grounds today. One particularly clear surviving example is a terraced track cut into the hill slope on the western side of the lake that runs towards the now blocked entrance to the grounds which can be seen in Stratford's sketch. To the east, between this track and the large pond, two rectangular levelled platforms roughly 52m by 16m are visible terraced into the slope. This is marked on Bayly's map as the site of the croquet ground,

again demonstrating the recreational use of the Repository Grounds (see Fig. 30).⁵⁴⁵ Stratford's plan also shows a series of strangely shaped earthworks at the northern end of the large pond. Mid-nineteenth-century photographs show that these earthworks functioned as part of the Repository exercises. A large mound exists in the same location today but it has been substantially modified, probably in the later twentieth century, by the dumping of large amounts of rubble – perhaps related to the infilling of the north-western spur of the pond.

Once the Rotunda had been established at Woolwich, its central role in the itinerary offered to visiting dignitaries ensured that its unique structure, and presumably the grounds and training facilities which surrounded it, became internationally known. A. H. Burne has written that:

By 1843 ... Woolwich had come to be looked upon as the accepted place to which to bring distinguished foreigners, whom it was desired to impress with the might and majesty of the British armed forces. They would be trotted round the Dockyard, Arsenal, Repository, &c., and witness a review on the Common.⁵⁴⁶

The picturesque nature of the Repository Grounds would have been of great significance as a backdrop against which to show important visitors the Rotunda and Royal Military Repository (see pp. 137-8). Visitors from the British royal family included William IV in 1830 and William IV and Queen Adelaide in 1835, while the accession of Victoria was celebrated with a Grand Review at Woolwich on 5 July 1837, attended by more than 100,000 people.⁵⁴⁷ The young Queen was taken on a tour of the facilities, including 'a visit to the Royal Military Repository for the purpose of inspecting the Model room and observing the manoeuvres of the heavy Artillery'.⁵⁴⁸ Royal visitors from other countries included the Prince and Princess of Orange and their sons in 1836 – when 'their Royal Highnesses next went through the Repository, from which they proceeded to the mess-room of the artillery, where they partook of a sumptuous collation' – and, in 1842, Frederick William IV, King of Prussia, and Duke Ferdinand of Saxe Coburg, in 1843 Grand Duke Michael of Russia, and in July 1853 there was a review for the King and Queen of Hanover.⁵⁴⁹

As the Repository Grounds were clearly functioning as a recreational space and providing an important picturesque backdrop to the Rotunda, it is likely that planting schemes were instigated. It is not clear what form these may have taken, though the 1860s maps and many of the surviving photographs show more formal planting closer to the Repository Sheds and the Rotunda and a more naturalistic landscape further to the west around the ponds.⁵⁵⁰ Some evidence of formal planting can be seen in the form of earthwork terraces that survive along the northern and western boundaries of the site. The 1839 and 1860s maps show lines of trees planted in these locations, presumably on the terraces (see Fig. 30).⁵⁵¹ Surviving trees show that these were horse chestnut.

Other remnants of the possible planting scheme only survive in the form of individual established trees within the Repository Grounds or as large tree stumps. These trees include oak and horse and sweet chestnut, some of which

may be remnants from the woodland that existed prior to the establishment of the Repository. Any pattern within these fragmentary survivals is difficult to discern, but there appears to be a possible line of oaks along the eastern side of the stream in the southern part of the grounds and a concentration of oaks and sweet chestnuts where a number of paths formerly converged to the south of the large pond. The 1869 Ordnance Survey map also shows formal planting around the ponds and a tree-line (possibly an avenue) to the north of the large pond.⁵⁵²

In late 1859, because the Royal Military Repository was no longer in use as a training school for the Artillery – a school of gunnery having been established at Shoeburyness in Essex earlier that year (see pp. 7-8) – the Rotunda and its contents were transferred from the direct control of the War Office to that of the Ordnance Select Committee.⁵⁵³ Although Woolwich Common and the Repository Grounds continued to be used by the Royal Artillery for training and drill, their practical value to the corps was beginning to decline as larger guns necessitated larger ranges. However, the series of Repository exercise photographs (probably by Spiller), dating from 1858 and the years immediately following, demonstrate that the Repository remained in use as a training facility until at least this date (see, for instance, Fig. 82).⁵⁵⁴

Mortar practice from the Greenhill Battery, to the east of the Rotunda, continued until 1873, and the Repository ponds were still occasionally being used for exercises in the 1880s, but the bulk of such activities were transferred to Plumstead, Kent, and Shoeburyness during the 1850s and 1860s.⁵⁵⁵ The Royal Engineers, it should be noted, finally moved from Woolwich to their new station at Chatham in 1857. Though the use of the Repository Grounds as a training area for the practice of artillery exercises was declining in the late 1800s, however, the area continued to have some military training uses and photographs from the late nineteenth or early twentieth centuries show well-kept grounds, suggesting its continuing use as a recreational amenity.⁵⁵⁶ This is supported by an 1879 comment: ‘The band of the Royal Artillery plays frequently, in the Repository Grounds or on the common, about 5 p.m., from May to October’.⁵⁵⁷

By the late nineteenth century, the nature of the public’s involvement in the military work at Woolwich had changed. Though the Rotunda was still functioning as a museum during the first half of the 1900s, it is not clear what status the Repository Grounds held at this time. The memories of a Woolwich resident seem to suggest that it was still occasionally accessible to the public, albeit on a restricted basis, with the lake being used for ice-skating.⁵⁵⁸ Photographs of cadets digging trenches in the Repository Grounds in the early twentieth century suggest a change in emphasis in training activities in Woolwich, with the ‘science’ of artillery manoeuvres being taught at Shoeburyness and elsewhere.⁵⁵⁹ Clearly, by the time practice trenches were being dug, the recreational role of the grounds was diminishing. The Ordnance Survey maps of the area appear to show that a boundary was erected to the west of the Rotunda between the 2nd (1896) and 3rd (1916) editions, which may suggest that the Repository Grounds had been divorced from the Rotunda Museum at this point, though there is nothing to suggest there would not have been access through a gate.⁵⁶⁰ The maps also appear to show that the access to the Repository Grounds

from Hillreach was blocked around this date. In the inter-war years, the development of married accommodation on the slopes of Greenhill to the east of the Repository further emphasises the changing role of the area.

Aerial photographs taken by the RAF in the 1940s show that the Repository Grounds were in active use during the Second World War with trenches, dispersed storage and various other structures visible at this time, some of which left structural and earthwork traces. The woodland experienced an intense period of activity between (and possibly before) early August 1944 and October 1945, when a tented camp can be seen in the far west of the woodland beyond the two smaller ponds (Fig. 84).⁵⁶¹ The function of the camp is unknown. The roof of the Rotunda was also given a camouflage paint scheme during the Second World War.⁵⁶²

The Repository Grounds maintained a similar training function throughout the later twentieth century, as evidenced by structures such as an assault course and respirator training room, and were used for physical training and 'command task' training.⁵⁶³ The recreational nature of the Repository Grounds also survives through the Dell Angling Society, whose access is restricted to the area around the largest pond.



Fig. 84 The Rotunda and Repository Grounds seen from the air in October 1945. The camouflage paint scheme applied to the lead roof of the Rotunda is clearly visible, as is a tented camp at the top-left of the image, between the largest pond and Hillreach. (Historic England Archive [RAF Photography], ref. RAF 106G/UK/916 6112)

Conclusion

The combination of the Rotunda and its collection, the training facilities within the Repository Grounds and the younger Congreve's linear fortification created at Woolwich a state-of-the-art facility for artillery training, which was later complemented by the juxtaposition of the Royal Artillery Institution's observatory building just to the east. The stories of the Rotunda, Repository Grounds and the training fortification are fundamentally intertwined, reflecting the growing professionalism of the British Army in the early nineteenth century, and consequently their combined survival is all the more significant. The purpose-designed training landscape created within the Repository Grounds has continued in use for military training in some form until the present day. Despite the twentieth-century training activities and later disturbances, the landscape that remains is largely the mid-nineteenth-century recreational and training landscape described in documentary sources, pictured by artists and recorded on maps.

During its use the landscape was to become quickly valued for its aesthetic as well as practical aspects. This is embodied in the younger Congreve's wish to place the Rotunda in its current location because of its usefulness to the Royal Military Repository and the picturesque location that the area afforded. In this location the building combined its primary military functions with its public role as a museum. Though training facilities were built in the Repository before the arrival of the Rotunda, the landscaping of the grounds surrounding the building was undertaken at the same time and immediately following its re-erection, in order to provide the terrain and features necessary for artillery training – the most substantial of which was the linear fortification, of which a large stretch survives. Thus the teaching collections within the Rotunda were complemented by the educational landscape immediately outside the building; together they fulfilled the objectives of the Royal Military Repository, to give artillery officers a full understanding of the practical and theoretical handling of ordnance. Consequently, as a centrepiece to the Repository Grounds, the Rotunda in its second incarnation is a landmark for which a precise location was chosen and it is inseparable from the landscape context that was created for it. The story of the Repository Grounds also reflects the evolving relationship of civil society and the armed forces during the 1800s, which in the early and middle parts of the century was one of relative openness.

CONCLUSION: THE SIGNIFICANCE OF THE ROTUNDA AT WOOLWICH - SUSAN SKEDD AND EMILY COLE

Royal and Political Significance

The Rotunda formed part of a vast military complex at Woolwich that demonstrated the might of nineteenth-century Britain to the country and to the wider world. The building had been created to celebrate one of the most significant of British military and political victories – the defeat of Napoleon – and thus fitted well into its new role and location. There was great royal and patriotic pride in what went on at Woolwich, as testified by the popularity of military reviews on the common. As has already been shown, the Prince Regent's attachment to the Rotunda and all that it stood for was a principal reason for the survival of the building following the 1814 celebrations and for its removal to Woolwich.

George's brother, William IV, who acceded to the throne in June 1830, was a great lover of the Royal Artillery, which the press described as 'his favourite corps'. On 27 July of that year, just a month after he had become King, William attended a Grand Review of the Artillery and Engineers at Woolwich, accompanied by Queen Adelaide and a large retinue, and was entertained to a grand dinner in the Mess.⁵⁶⁴ *The Times* reported that, 'At an early hour the surrounding villages were nearly emptied of their inhabitants, who poured into Woolwich from all directions, and from thence on to the Common, where the whole of the Artillery and Engineers stationed at Woolwich were drawn out'.⁵⁶⁵ King William and Queen Adelaide arrived promptly at noon, accompanied by figures including the King of Württemberg, the Duke of Cumberland, Prince Leopold and Lord Fitzroy Somerset. After inspecting the troops, taking refreshments in the mess room, and watching the mortar practice, the group moved towards the Rotunda: 'His Majesty then entered the Repository, and after half an hour's examination, the Royal party and suite entered their carriages, and departed under the fire of a royal salute and the cheers of the multitude, at half-past 5 o'clock'.⁵⁶⁶

Five years later, on 24 July 1835, William IV returned once again to Woolwich, presiding over a grand review on the common. The press noted how 'admirably adapted its extensive common is for the manoeuvres of large bodies of horse, foot, and artillery; and also for affording a commodious space to an immense assemblage of spectators, without even the appearance of crowding in any part'.⁵⁶⁷ After watching the displays, the royal party moved on to the mess room, and seem – as before – to have walked on to the Repository Grounds. According to Lady Lefroy, writing in the late nineteenth century, 'Poor Queen Adelaide was dragged round on foot to see everything, and on getting near the Rotunda, being quite exhausted, she dropped down into a chance wheel-barrow she saw! and refused to move'.⁵⁶⁸ A reporter for *The Times* – who, thankfully, did not witness the Queen's temporary collapse – concluded that the whole military spectacle 'afforded another proof, if proof can now be wanted, of the high state of military skill and discipline of British troops'.⁵⁶⁹

The accession of Victoria was celebrated with a grand review at Woolwich on 5 July 1838, an occasion attended by more than 100,000 people. The young Queen was taken on a tour of the facilities at the Arsenal and on Woolwich Common, including a visit to the Royal Military Repository to see ‘the model-room and ... the manoeuvres of Heavy Artillery’.⁵⁷⁰ A reporter noted that ‘None but the Royal carriages will be admitted into the Repository’.⁵⁷¹ Visits by members of the royal family and dignitaries continued throughout the 1800s and even into the twentieth century: on 26 July 1978, the bicentenary of the Artillery Museum, the Duke of Gloucester ‘honoured the Royal Regiment with a visit to the Rotunda’.⁵⁷²

Such demonstrations have been staged not only for British but also for foreign princes: in May 1836, the Prince of Orange and his sons were received at Woolwich ‘in a manner suitable to their rank’, and were fêted with ‘a grand field-day of artillery’. The Prince – accompanied by the Dutch Ambassador, the Master-General of the Ordnance, and members of King William’s household – ‘went through the Repository, from which they proceeded to the mess-room of the artillery, where they partook of a sumptuous collation’.⁵⁷³ On 4 February 1842, the King of Prussia visited Woolwich, in the company of a group including Prince Albert and Duke Ferdinand of Saxe Coburg. Also present was the Duke of Wellington, ‘who walked on one side and the Duke of Cambridge on the other, with His Majesty across the common, and through the south-west gate to the Repository’, where they remained about half an hour.⁵⁷⁴ In October of the following year, Grand Duke Michael of Russia was reported to have gone round ‘the whole of the interior of the Rotunda, and across the centre’; the press noted that ‘it is impossible to particularise the objects which attracted his attention most, as he had an eye upon everything’.⁵⁷⁵ A. H. Burne has written that:

By 1843 ... Woolwich had come to be looked upon as the accepted place to which to bring distinguished foreigners, whom it was desired to impress with the might and majesty of the British armed forces. They would be trotted round the Dockyard, Arsenal, Repository, &c., and witness a review on the Common, after which the officers of the Royal Artillery could be trusted to entertain them suitably.⁵⁷⁶

This all goes to show that – at Woolwich, as at Carlton House – the Rotunda continued to play a part in demonstrating Britain’s growing military power. The building and the surrounding Repository Grounds clearly impressed visitors, many of them of royal or ambassadorial rank, and gained an international reputation. It is particularly fascinating to consider the Duke of Wellington’s visit of 1842, made twenty-eight years after the structure had originally been designed and erected for the Carlton House fête held in his honour. In this way and in others, the Rotunda had a continuity of purpose from its time as a royal ballroom to its time as a military museum. Its form may have been somewhat changed – and its context and content may have been entirely different – but the building’s audience was, to a certain extent, the same. That it was chosen to fulfil this role at Woolwich, as it had at Carlton House, was a tribute to its remarkable success.

Military and Educational Significance

The relocation of the Rotunda in the Repository Grounds brought the building a welcome new lease of life as part of the large military site at Woolwich. During the Crimean War, between 1853 and 1856, the rapid expansion of the Royal Arsenal – both in terms of its scientific research and its industrial output – turned Woolwich into the most important military complex in Europe. The Rotunda became a direct beneficiary of this expansion for, as visitors flocked to see the latest artillery in action, they also took time to admire the artillery from a past era on display within the building. As we have seen, the collections contained within the building gained new exhibits in the form of newly obsolete weapons from the Arsenal as well as the new battle trophies won during the Crimean War.

In addition to its role as a museum, the Rotunda – together with the Repository Grounds – provided the Artillery and Engineers with a unique educational resource and played an important role in the training of commissioned and non-commissioned artillery. The practical artillery exercises made possible by the creation of the Royal Military Repository in 1778 were recorded and promulgated in a succession of publications that emanated from Woolwich. Sir William Congreve's own treatise pre-dated the Rotunda's re-erection at Woolwich, but among subsequent important publications were Captain F. A. Griffiths's *The Artillerist's Manual, and Compendium of Infantry Exercise, Sword Exercise, Field Battery Exercise, Service of Heavy Ordnance, Gyms, &c.* (Woolwich, 1839) and Edward Mourrier Boxer's *Treatise on Artillery, prepared for the use of the Practical Class, Royal Military Academy* (London, 1854), together with a folio volume of *Diagrams to Illustrate the Service and Management of Heavy Ordnance referred to in Treatise on Artillery* (London, 1854). General Lefroy himself produced a *Handbook of Field Artillery for the Use of Officers* (London, 1854), which was published by the Royal Artillery Institution. Encased in a leather carrying pouch, this manual was immediately put to use in conflict for '300 copies were sent to the Crimea in July 1854'.⁵⁷⁷ It remained a valuable publication and was reprinted in 1884.

The continuing suitability of the Repository Grounds for training the Artillery was made clear in the debate about the future of the Artillery and Engineer corps at Woolwich during the 1850s. The anonymous author of one pamphlet, *The Royal Military Academy, and the Artillery and Engineer Services* (London, 1855), acknowledged that 'Woolwich is a great Artillery depot, and the best situation therefore for an Artillery School', whilst arguing that Woolwich was 'in some respects the very worst for an Engineering School; inasmuch, as there is not a particle of fortification in it by which to illustrate the theory of fortification'.⁵⁷⁸

Woolwich, of course, had been a focus for military education from the founding of the Royal Military Academy in 1741, and remained so until the Academy's closure in 1939. This pioneering institution supplied Artillery and Engineering cadets with a formal course of study and introduced a meritocratic means of progressing through the ranks. It was not until 1802 – with the founding of the Royal Military College at Sandhurst – that officer training was extended to the rest of the British Army. The two educational institutions amalgamated in 1947 to form the Royal Military

Academy Sandhurst. It is a moot point how much the officer cadets of the Royal Military Academy made use of the facilities offered by the Royal Military Repository, and in particular by the Rotunda. Whilst the Royal Military Academy had its own library and model room, it is inconceivable that the cadets were unfamiliar with the models and exhibits contained within the Rotunda. It is recorded that cadets were still being shown the building and its contents in the 1930s, as this anecdote confirms: ‘Even now it is a remarkable construction, and recruits, when asked what exhibit in the Rotunda had interested them most, frequently reply “the Rotunda itself”’.⁵⁷⁹

A Public Building

From its inception, Sir William Congreve the elder intended the Repository Museum to be open to the public. Though it was part of a highly important military institution where top-secret research was carried out – and was always, to a certain extent, ‘little-known’ – it was also a highly visible visitor attraction, deliberately made accessible to the public to show off the military might of Britain.⁵⁸⁰ The Rotunda therefore embraced two key roles: specialist military education, and the stimulating of interest and knowledge among a broader group of people. This view of the Rotunda’s role has been noted throughout its history. For example, in 1973 a Senior Design Officer of the DOE wrote: ‘The museum deals with the development of armament from literally the Battle of Crecy until the present day. As such it appears to have a dual purpose as a public museum, incorporating facilities for entertainment and research, and as part of the military training curriculum’.⁵⁸¹

The earliest views of the Rotunda emphasise this split (but related) purpose. Whilst some show the building surrounded by cadets – most notably, that of 1844 showing Royal Artillery Repository exercises, engraved by John Grant (see Fig. 23) – others show it inhabited by families and civilians, who are examining the exhibits. For instance, in George Scharf’s watercolour of the interior in 1828 (see Fig. 20), a guide is pointing with a long stick to the diorama of St James’s Park and Carlton House Gardens, presumably explaining to the group of five visitors the history of the Rotunda’s previous existence in Westminster. Opening times and arrangements – to the Arsenal, as well as to the museum – were set out in various guidebooks, as well as in the Rotunda’s series of catalogues. *Dickens’s Dictionary of London* for 1879 explained that in order to gain access to the Arsenal (‘3 mins’ walk from the South-Eastern Railway station’):

Visitors must be furnished with a ticket from the War Office, obtained by personal application, or by letter to the “Secretary of State for War, War Office, Pall Mall, S.W.”, stating names and addresses, and declaring that they are British subjects. Visitors with tickets are admitted on Tuesday or Thursday between the hours of 10 and 11.30 a.m. and 2 till 4.30 p.m. Foreigners must have special tickets, obtained through their ambassadors in London. Strangers without passes are refused admission.⁵⁸²

Dickens jun. continued: ‘The Artillery Barracks, the headquarters of the Royal Horse and Foot Artillery, are about fifteen minutes’ walk from the steam-boat pier, and

ten minutes from the South-Eastern Railway-station. These barracks are admirably situated, facing the common where all the artillery exercises and the great reviews take place ... The Rotunda, an interesting military museum, near the barracks, is open from 10 till 6 in summer, and from 10 till 4 in winter'.⁵⁸³ 'It would be a long task, and an unprofitable one', noted *The Penny Magazine* of 1839, 'to notice all the objects of interest in this museum; but several hours might be advantageously employed in their inspection'.⁵⁸⁴

A dual use – by military and by public – is also true of the Repository Grounds, at least for some of their history. While they played an important part in specialised training, a role which has already been discussed, they were also pleasure grounds. They were portrayed in this light by the artist T. M. Baynes in two lithographs, one of 1822 and the other of 1823, both depicting – in a picturesque manner – the vista from the Rotunda; the earlier view clearly shows an elegant lady and gentleman walking through the grounds, while the later scene features two men in top hats (Fig. 85). In 1879, *Dickens's Dictionary of London* noted that 'The band of the Royal Artillery plays frequently, in the Repository Grounds or on the common, about 5 p.m., from May till October'.⁵⁸⁵ In describing the Rotunda's surroundings in 1949, Sam Price Myers wrote: 'Here are the Repository Ponds on which, during Victorian military revels, a band afloat on a raft made music'.⁵⁸⁶ Even on such occasions, predominantly military in tone, there would have been huge numbers of the public in attendance, as is shown by accounts in *The Times*. Although the grounds were considered private for certain parts of their history – for instance, they were described as such by *Chambers's Journal* in 1868 – they were always admired as 'beautiful'; thus, the Rotunda was known as a picturesque spot as well as an educational day out.⁵⁸⁷



Fig. 85 View near the Rotunda engraved by T. M. Baynes and published in November 1822, showing the Repository Grounds and the wider landscape. (London Metropolitan Archives, City of London [Collage: the London Picture Archive, ref. 286037])

By the late nineteenth century, the nature of the public's involvement in the military work at Woolwich had changed, although Woolwich Common – whilst no longer the scene of great reviews and spectacles involving visiting dignitaries – hosted displays of military equipment and gunnery known as Royal Artillery 'At Homes' into the first half of the twentieth century.⁵⁸⁸

'The Rotunda irrepressible'

While the history of the Rotunda at Carlton House is essentially that of a temporary building, its history at Woolwich is that of a permanent structure. The alterations carried out as part of its re-erection in 1819-20 essentially created a new building, albeit one which followed a pre-existing design and incorporated reused materials. The Rotunda was deliberately made stronger, both on account of its more exposed situation and its long-term role in the Repository, being given brick outer walls – set with new windows and a single entrance – a central supporting sandstone column, and a new board and canvas roof covering (replaced by lead in the 1860s). By the 1880s, W. T. Vincent could state categorically: 'Originally a mere marquee, the Rotunda is now a solid and permanent structure'.⁵⁸⁹

This resurrected building gained an interest and importance all of its own. The Rotunda Museum quickly developed an international reputation, and housed what was undoubtedly one of the most impressive, and useful, collections of its type anywhere in the world. Within its English context, the Rotunda is, as J. P. Kaestlin has pointed out, 'in age junior by only twenty years to the British Museum and to few, if any, other national museums in the London area'.⁵⁹⁰ Writing fifteen years later, in 1978, Major Bartelot emphasised that the Rotunda was 'a prominent part of the national heritage in that it is the only artillery museum in the country'.⁵⁹¹ But the Rotunda was, as has been shown, much more than just a museum; its role in military training at Woolwich was envisioned from the outset, and long remained a vital part of its character. These points, when considered alongside the building's earlier history and significance as a structurally innovative ballroom at Carlton House, gave rise to the Rotunda's reputation as 'a building which is unique among the public edifices of the world'.⁵⁹² In historic association, the building is equally rich: having been designed by John Nash for a prince and a military hero, it was visited and appreciated by countless others during the course of at least the nineteenth century. On account of its design, history, purpose, location and contents, the Rotunda justifiably came to represent the military might of Britain.

The Rotunda at Woolwich differed from its previous incarnation in more than just physical terms. At Carlton House, the building had always been envisioned as temporary, and seems in no way to have dictated the design or layout of the royal gardens. At Woolwich, however, the re-erected Rotunda became the focus for a specially designed landscape which provided the terrain and features necessary for artillery training. Thus, the teaching collections within the Rotunda were complemented by the educational landscape immediately outside the building. Though both could function independently, they served a special role when used together, fulfilling the objectives of the Royal Military Repository: to give artillery officers a full understanding of the practical and theoretical handling of ordnance.

Despite its importance, the Rotunda has suffered rather a mixed history, as this report has made clear. Its fortunes have been variously in the ascendant and on the decline, linked in part to national politics but most closely to the priorities of the military department of which it has formed part. That it has survived at all is testament to the support and championship of a number of key figures, among them the Congreves, General Lefroy, Major-General Hughes, Major Bartelot and the Rotunda's various curators. There can be no doubt that, at present, the building is in decline. The ongoing removal of the collections from the Rotunda – long threatened, and now finally carried out – has denuded it and extinguished its central purpose. That this change has taken place has to be the cause of real regret, for – although the building itself is of key importance (Fig. 86) – it was the collections which gave the Rotunda its context and meaning in Woolwich; as a museum, it has always proved highly successful. However, when its history is considered, there are reasons to be optimistic about its future, despite challenges surrounding access and sustainability; J. P. Kaestlin once referred to the building as 'The Rotunda irrepressible', and it has certainly proven itself to be such.⁵⁹³ That public access should form part of a successful future is perhaps worth stating; since its opening at Woolwich in 1820, the Rotunda has functioned as a public building, whilst also serving its primary military functions. A much-loved element of the Woolwich landscape, the Rotunda certainly deserves a wider audience.

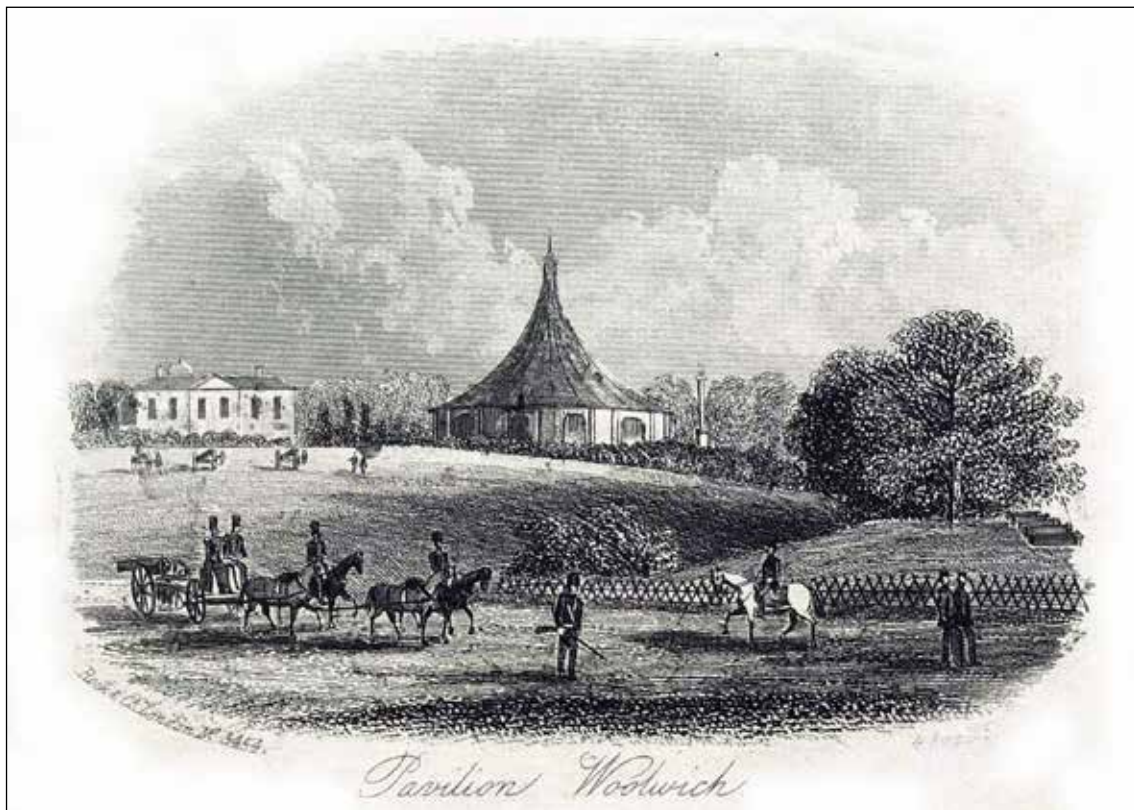


Fig. 86 An engraving by Rock & Co. dating from 4 August 1857, showing the Rotunda from the north-east, before the construction of the north extension and the replacement of the roof. The pedimented building on the left is the Royal Artillery Institution's observatory, originally built 1838-39 with extensions of 1852-53, including this east front. (Courtesy of Lewisham Local History and Archives Centre Collection, ref. A/68/6/18)

ENDNOTES

1. Jonathan Clarke, 'Cones, not Domes: John Nash and Regency Structural Innovation', *Construction History*, vol. 21 (2005-6), pp. 43-63; Sarah Newsome, Jonathan Millward and Wayne Cocroft, *Repository Woods, Woolwich, Greater London: An Archaeological Survey of the Royal Military Repository Training Grounds* (English Heritage Research Report series, no. 14-2009)
2. Ed. Peter Guillery, *Survey of London, Vol. 48: Woolwich* (New Haven and London, 2012), pp. 350-360
3. See: Paul Fregosi, *Dreams of Empire: Napoleon and the first world war 1792-1815* (London, 1989), Rory Muir, *Britain and the Defeat of Napoleon 1807-1815* (London, 1996), and Elizabeth Longford, *Wellington: The Years of the Sword, 1769-1815* (London, 1969)
4. Julian Paget, *Wellington's Peninsular War* (London, 1990), p. 56
5. *Dictionary of National Biography*, vol. 20 (1967-68 reprint), p. 1100
6. E. A. Smith, *George IV* (New Haven, 1999), p. 132 (quoting D. M. Stuart)
7. Steven Parissien, *George IV: The Grand Entertainment* (London, 2001), p. 102
8. *Ibid*, pp. 107-8
9. *Ibid*, p. 111
10. As Prince Regent, George commissioned some gold and silver-gilt plate including an elaborate plateau bearing the arms of the Black Prince, copied from his tomb in Canterbury Cathedral: *Carlton House: The Past Glories of George IV's Palace* (exhibition catalogue, The Queen's Gallery, Buckingham Palace, London, 1991), p. 21
11. See: Parissien, *George IV*, pp. 264-81
12. Ed. A. Aspinall, *The Letters of King George IV: 1812-30* (Cambridge, 1938), p. 429
13. *Ibid*, p. 431
14. *Ibid*, p. 445
15. *Gentleman's Magazine*, vol. 84, part i (January to June 1814), p. 510
16. Roger Fulford, *George the Fourth* (London, 1935), p. 134
17. Robert Southey, *Carmen Triumphale and Carmina Aulica* (2nd edition, London, 1821)

18. Doris Leslie, *The Great Corinthian: A portrait of the Prince Regent* (London, 1952), p. 181
19. Joanna Richardson, *George IV: A Portrait* (London, 1966), p. 141
20. J. B. Priestley, *The Prince of Pleasure and His Regency 1811-20* (London, 1969, 2002 edition), p. 118
21. Ibid, p. 124
22. Ed. Richard Edgcumbe, *The Diary of Frances Lady Shelley, vol. 1: 1787-1817*, 2 vols (London, 1912), pp. 59-60
23. Ibid, p. 61
24. *Gentleman's Magazine*, vol. 84, part i (January-June 1814), p. 615
25. For these see the Corporation of London's website: <http://collage.cityoflondon.gov.uk/>. Previously attributed to George Clint, the painting is now believed to be the work of Clennell; see: Ed. Celina Fox, *London – World City, 1800-1840* (London, 1992), p. 242
26. Richardson, *George IV*, p. 141
27. Ed. Lytton Strachey and Roger Fulford, *The Greville Memoirs 1814-1860*, 8 vols (London, 1938), vol. 1 (January 1814-July 1830), pp. 10-11
28. Edgcumbe, *The Diary of Frances Lady Shelley*, p. 63
29. Priestley, *The Prince of Pleasure*, p. 123
30. See: *Annual Register* (1814), pp. 57-59
31. Ibid, p. 60
32. *Gentleman's Magazine*, vol. 84, part ii (July-December 1814), p. 79
33. Edgcumbe, *The Diary of Frances Lady Shelley*, pp. 68-9
34. Ibid, p. 71
35. *Annual Register* (1814), p. 67
36. Ibid, pp. 68-9
37. Ed. H. M. Colvin, J. Mordaunt Crook and M. H. Port, *The History of the King's Works, Vol. VI: 1782-1851* (London, 1973), pp. 318-9

38. Fulford, *George the Fourth*, p. 143
39. *Annual Register* (1814), p. 69
40. *The Times*, 29 July 1814, p. 3
41. *Gentleman's Magazine*, vol. 84, part ii (July-December 1814), p. 181
42. Fulford, *George the Fourth*, p. 144
43. A. E. Bray, *Life of Thomas Stothard* (London, 1851), p. 148
44. Ibid, p. 149; Edward Croft-Murray, *Decorative Painting in England 1537-1837* (London, 1970), p. 224
45. Bray, *Life of Thomas Stothard*, p. 148; Croft-Murray, *Decorative Painting*, vol. 2, p. 224
46. Bray, *Life of Thomas Stothard*, p. 149
47. Croft-Murray, *Decorative Painting*, vol. 2, p. 224
48. *Gentleman's Magazine*, vol. 84, part ii (July-December 1814), p. 182
49. Fulford, *George the Fourth*, p. 144
50. John Summerson, *The Life and Work of John Nash, Architect* (London, 1980), pp. 98-99
51. Ibid, p. 99
52. The bridge was unharmed and was later secured and used by pedestrians for some time. It was still in St James's Park in 1818.
53. Fulford, *George the Fourth*, p. 144
54. *Gentleman's Magazine*, vol. 84, part ii (July-December 1814), pp. 179-80
55. Ed. Colvin, *History of the King's Works, Vol. VI*, p. 319
56. For these and other details on Carlton House see: Survey of London, Vol. 20: *Trafalgar Square and Neighbourhood* (London, 1940), pp. 69-76; Parissien, *George IV*, pp. 118-133; *Carlton House: The Past Glories of George IV's Palace*; ed. Colvin, *History of the King's Works, Vol. VI*, pp. 307-22; and David Watkin, *The Royal Interiors of Regency England from watercolours first published by W. H. Pyne in 1817-20* (London, 1984), pp. 100-26
57. Ed. Colvin, *History of the King's Works, Vol. VI*, p. 309

58. Dorothy Stroud, *Henry Holland: His Life and Architecture* (London, 1966), p. 67
59. Ed. Kathryn Cave, *Diary of Joseph Farington*, 16 vols (New Haven and London, 1978-84), vol. 7, p. 3258/2745
60. *Carlton House: The Past Glories of George IV's Palace*, p. 15
61. TNA LC1/6 (letter of 23 December 1813)
62. TNA WORK 19/11/5, f. 32
63. TNA WORK 19/3, f. 220
64. *Carlton House: The Past Glories of George IV's Palace*, p. 34
65. Ed. Colvin, *History of the King's Works*, Vol. VI, p. 321
66. Watkin, *The Royal Interiors of Regency England*, p. 100
67. *Ibid*, p. 103
68. Stroud, *Henry Holland*, p. 71; Watkin, *The Royal Interiors of Regency England*, p. 100
69. Stroud, *Henry Holland*, p. 73
70. The Blue Velvet Room, part of the principal suite of apartments, demonstrates this well. The room, originally the Bedchamber (1784), subsequently became known as the Council Chamber (1789), Princess Caroline's Private Drawing Room (1794), the Tapestry Room (1801), the Blue Velvet or Admirals Room (1806), the Closet (1813), the Blue Velvet Room (1816), and His Majesty's Closet (1826).
71. Watkin, *The Royal Interiors of Regency England*, p. 101
72. *Ibid*, p. 17
73. *Carlton House: The Past Glories of George IV's Palace*, p. 20
74. Watkin, *The Royal Interiors of Regency England*, p. 106
75. *Ibid*, p. 120; *Carlton House: The Past Glories of George IV's Palace*, p. 21
76. W. H. Pyne, *The History of the Royal Residences*, vol. 3 (London, 1819), p. 90
77. *Ibid*, p. 47
78. *Carlton House: The Past Glories of George IV's Palace*, p. 18. A carpet was made in 1792 by Thomas Moore 'after a design given by his Royal Highness'.

79. Ibid, p. 17
80. Smith, *George IV*, p. 135
81. TNA WORK 6/26, f.133v
82. TNA LC1/5; *Carlton House: The Past Glories of George IV's Palace*, p. 30
83. Carlton House file, Royal Collection, St James's Palace
84. TNA WORK HO73/24 I
85. TNA HO73/24 part I. Copy in The Royal Collection's Carlton House file.
86. Abstract of bills for works done for fête of 1811, Royal Archives MSS 31547. Copy in The Royal Collection's Carlton House file
87. The Royal Collection, Carlton House file; TNA WORK 5/103, LC11/15
88. Jutsham, I, Receipts and Deliveries (unpublished material in archives of The Royal Collection, St James's Palace), p. 132 and p. 134
89. Fox, *London – World City*, p. 78
90. *Carlton House: The Past Glories of George IV's Palace*, pp. 20 and 31
91. Ed. Colvin, *History of the King's Works*, Vol. VI, p. 314; *Carlton House: The Past Glories of George IV's Palace*, p. 30
92. Smith, *George IV*, p. 134
93. RA 35193. Copy in The Royal Collection's Carlton House file.
94. Ed. Lady Jackson, *The Bath Archives: A further selection from the Diaries and Letters of Sir George Jackson KCH from 1809 to 1916* (London, 1873), vol. I, p. 269-70
95. Ibid, p. 270
96. John B. Papworth, *Select View of London* (London, 1816), p. 11
97. Jackson, *The Bath Archives*, vol. 1, p. 271
98. Ibid, p. 270
99. Smith, *George IV*, p. 134
100. Jackson, *The Bath Archives*, vol. 1, p. 267

101. Ibid, p. 269
102. Ibid, p. 271
103. Priestley, *The Prince of Pleasure*, p. 40
104. Ibid
105. Ed. Cave, *Diary of Joseph Farington*, vol. 11 (January 1811-June 1812), p. 3957
106. Ed. Colvin, *History of the King's Works, Vol. VI*, p. 314
107. An example of the latter is the 'Shakespeare Jubilee Rotunda' built in 1769 at Stratford-upon-Avon. It was a polygonal structure, boarded on its outside. See: David King, *Complete Works of Robert and James Adam* (Oxford, 1991), p. 403
108. T. F. Hunt, *Exemplars of Tudor Architecture, Adapted to Modern Habitations* (London, 1830), pp. 97-99; ed. H. M. Colvin, *The History of the King's Works, Vol. IV, part II: 1485-1660* (London, 1982), p. 102
109. Hunt, *Exemplars of Tudor Architecture*, pp. 98-99; ed. Colvin, *History of the King's Works, Vol. IV, part II*, pp. 319-20
110. See: Godfrey Rhodes, *Tent and Tent-life from the Earliest Ages to the Present Time* (London, 1858), pp. 141-2
111. Ibid, p. 153
112. Ibid, pp. 154-5
113. Ibid, pp. 145-6
114. Osvald Sirén, *China and Gardens of Europe in the Eighteenth Century* (New York, 1950), pp. 179-194; Patrick Conner, *Oriental Architecture in the West* (London, 1979), p. 75
115. Conner, *Oriental Architecture*, p. 74
116. Sirén, *China and Gardens of Europe*, plate 31
117. *Gentleman's Magazine*, vol. 85 (1765), p. 354
118. Conner, *Oriental Architecture*, pp. 89-90. It is interesting to note that Bagatelle was taken on as a hunting lodge by Napoleon in 1809.
119. John Morley, *The Making of the Royal Pavilion Brighton: Designs and Drawings* (London, 1984), p. 270

120. Ibid
121. Fulford, *George the Fourth*, p. 141; TNA WORK 6/26, f. 129
122. TNA WORK/19/11/5 (memorial of 18 December 1815)
123. Ibid (letter of 20 October 1815)
124. TNA WORK 6/27, f. 239v (letter of 2 May 1815)
125. TNA WORK 6/26, f. 235v (letter of 31 May 1815)
126. TNA WORK 6/27 (letter of 1 March 1815)
127. TNA WORK 19/11/5 (letter of 9 September 1814)
128. Many of the bills for this work were submitted for the quarter ending 5 July 1814, so work had clearly been completed by that time.
129. TNA LC11/17, LC11/18
130. Ibid. The word 'Rotunda' was commonly used in the eighteenth and nineteenth centuries to refer to freestanding circular or polygonal structures. For example, there were Rotundas at both Vauxhall and Ranelagh Pleasure Gardens, comparable in form and function with the Rotunda built at Carlton House (see Figs 15-16).
131. Fulford, *George the Fourth*, p. 140
132. TNA WORK 43/573-6
133. *The Star*, 16 July 1814, p. 3
134. This appears on the back of TNA WORK 43/573
135. Hunt, *Exemplars of Tudor Architecture*, p. 97
136. *Annual Register* (1814), p. 63
137. TNA WORK 19/11/5 (letter of 2 May 1815)
138. Ibid
139. Hunt, *Exemplars of Tudor Architecture*, p. 97
140. Sirén, *China and Gardens of Europe*, plate 170
141. See: Summerson, *The Life and Work of John Nash*, pp. 98-99

142. These roofs were among the first executed works by Nash at the Brighton Pavilion. A view of May 1818 shows the building in its intermediate state, still mainly by Henry Holland in its design, but with the conspicuous tent roofs rising at either end. See the section of this report on Structure and also John Dinkel, *The Royal Pavilion, Brighton* (London, 1983), p. 62
143. Morley, *The Making of the Royal Pavilion Brighton*, p. 70
144. See: *Gentleman's Magazine*, vol. 35 (1765), p. 354; Gregory Nosan, 'Pavilions, Power, and Patriotism: Garden Architecture at Vauxhall', in *Bourgeois and Aristocratic Cultural Encounters in Garden Art, 1550-1850* (see: www.doaks.org/COBOE.html), pp. 119-120
145. *Gentleman's Magazine*, vol. 35 (1765), p. 355
146. Ibid
147. Nosan, 'Pavilions, Power, and Patriotism', p. 120. Nosan suggests that the Vauxhall Rotunda could be read 'as an interactive monument that invited the Gardens' clientele to share the representational dais with both royals and "eminent British personages," a monument that perhaps fostered in audiences the sense that they played an equally integral and splendid role in shaping their nation's culture' (p. 121).
148. Ed. Colvin, *History of the King's Works, Vol. VI*, p. 318
149. Congreve was later to organise the firework display marking George IV's coronation (Parissien, *George IV*, p. 309).
150. Hunt, *Exemplars of Tudor Architecture*, p. 97
151. Ibid
152. TNA WORK 19/11/5, f. 39 (letter of 30 August 1818); *ibid*, f. 41 (letter of 4 September 1818)
153. *Ibid*, f. 41 (letter of 4 September 1818)
154. Summerson, *The Life and Work of John Nash*, p. 106
155. *Annual Register* (1814), p. 63
156. Ed. Aspinall, *The Letters of King George IV*, p. 472
157. Ed. Cave, *Diary of Joseph Farington*, vol. 13 (January 1814-December 1815), p. 4562
158. *Annual Register* (1814), p. 63

159. Ibid
160. Ibid. Between 1,800 and 2,000 people actually attended the fête.
161. Ibid
162. Ed. Edgcumbe, *The Diary of Frances Lady Shelley*, p. 68; *Annual Register* (1814), p. 65
163. Ed. Cave, *Diary of Joseph Farington*, vol. 13 (January 1814-December 1815), p. 4563
164. *Annual Register* (1814), p. 64
165. TNA LC11/18. The cost for 'cutting out and making Draperies, Hangings &c for the large Polygon Room, Temporary Supper Rooms, Temples & Tents in Garden' was £140 15s.
166. TNA LC11/17, LC11/18. The '5 light patent Lamp' was provided by Parker & Perry for the 'entrance Room', which appears to be a reference to the vestibule.
167. TNA LC11/18, LC11/17. Parker & Perry supplied four 'plate Glass Grecians mounted for 4 light patent Burners' in the private passage.
168. *Annual Register* (1814), p. 64; ed. Cave, *Diary of Joseph Farington*, vol. 13 (January 1814-December 1815), p. 4562; ed. Colvin, *History of the King's Works*, Vol. VI, p. 318
169. Ed. Cave, *Diary of Joseph Farington*, vol. 13 (January 1814-December 1815), p. 4562. The building referred to was the Rotunda at Ranelagh Pleasure Gardens, Chelsea, opened in 1742. The Rotunda measured 150 ft in diameter and was heated by a large fireplace in the centre. See: ed. Ben Weinreb and Christopher Hibbert, *The London Encyclopaedia* (London, 1983, 1990 edition), p. 637
170. Ed. Cave, *Diary of Joseph Farington*, vol. 13 (January 1814-December 1815), p. 4562
171. Ibid
172. *Annual Register* (1814), p. 64
173. Ibid; ed. Cave, *Diary of Joseph Farington*, vol. 13 (January 1814-December 1815), p. 4562
174. *Annual Register* (1814), pp. 64-5
175. Ibid, p. 64

176. TNA LC11/18
177. Jutsham, *Receipts and Deliveries*, pp. 329 and 331
178. TNA LC11/18; Jutsham, *Receipts and Deliveries*, p. 331
179. *Morning Post*, 14 October 1818, p. 3
180. Ed. Cave, *Diary of Joseph Farington*, vol. 13 (January 1814-December 1815), p. 4562
181. TNA LC11/18
182. *Annual Register* (1814), p. 64; TNA LC11/17
183. TNA LC11/18
184. Ed. Cave, *Diary of Joseph Farington*, vol. 13 (January 1814-December 1815), p. 4562
185. *Annual Register* (1814), p. 64
186. TNA LC11/18. The cost for both lustres and lamps was £1,134.
187. No surviving chandeliers of this description have been identified. According to Martin Mortimer (in *The English Glass Chandelier* [Woodbridge, 2000], p. 126), the chandeliers at Carlton House were all taken down on the dismantling of the palace, and were subsequently 'brought up to date' by the makers. Some were installed at Buckingham Palace. However, the scale of the alterations makes it 'virtually impossible to identify individual fittings from their descriptions in the Carlton House accounts'.
188. Ibid; *Annual Register* (1814), p. 64
189. Jutsham, *Receipts and Deliveries*, p. 202
190. Ibid, p. 186
191. *Annual Register* (1814), p. 64
192. Ibid. This is probably the 'white room' sometimes referred to in accounts.
193. Ibid; TNA LC11/17
194. Ibid
195. A bust of Wellington, also of 1814 and by Turnerelli, is held at Guildhall Art Gallery.

196. *Annual Register* (1814), p. 64; TNA LC11/18
197. TNA LC11/18
198. TNA LC11/17
199. *Annual Register* (1814), p. 64
200. TNA LC11/17
201. Jutsham, *Receipts and Deliveries*, p. 331
202. Richard D. Altick, *The Shows of London: A panoramic history of exhibitions, 1600-1862* (Cambridge, Mass., and London, 1978), p. 95
203. *Annual Register* (1814), p. 64
204. Bray, *Life of Thomas Stothard*, p. 149; Croft-Murray, *Decorative Painting in England*, p. 283. Also of 1814 is Stothard's design for the Wellington Shield, later made in silver-gilt by Benjamin Smith.
205. The Royal Collection, Carlton House file
206. The information on Pugin and Lafitte was kindly supplied by Rosemary Hill, whose biography of Pugin was published in 2007.
207. *Annual Register* (1814), p. 65
208. Jutsham, *Receipts and Deliveries*, p. 329
209. *Annual Register* (1814), p. 64
210. Ibid, p. 65
211. Ibid, p. 63
212. TNA LC11/17
213. Ibid. The price for each set of three was £126.
214. Ibid
215. Ibid. These six cost £252.
216. *Annual Register* (1814), p. 65
217. TNA LC11/18

- 218. Ibid
- 219. Jutsham, *Receipts and Deliveries*, p. 323 and p. 329
- 220. Ibid, p. 323
- 221. TNA WORK 19/11/5 (report of 16 March 1822)
- 222. *Annual Register* (1814), p. 63
- 223. Ibid, p. 65
- 224. Ed. Cave, *Diary of Joseph Farington*, vol. 13 (January 1814-December 1815), p. 4562
- 225. Ed. Edgcumbe, *The Diary of Frances Lady Shelley*, p. 70
- 226. Ed. Cave, *Diary of Joseph Farington*, vol. 13 (January 1814-December 1815), pp. 4562-3
- 227. Ibid, p. 4562
- 228. *Annual Register* (1814), p. 65
- 229. *Evening Mail*, 2 September 1814, p. 4
- 230. TNA LC11/18
- 231. Ibid
- 232. Ibid
- 233. The Royal Collection, Carlton House file
- 234. Jutsham, *Receipts and Deliveries*, p. 186
- 235. TNA WORK 19/11/5 (letter of 17 April 1815)
- 236. TNA WORK 6/27 (letter of 17 April 1815)
- 237. TNA WORK 6/27 (letter of 21 March 1815)
- 238. TNA WORK 19/11/5 (letter of 2 May 1815)
- 239. TNA WORK 6/27, f. 240
- 240. Ibid, f. 241

- 241. Ibid, f. 244v
- 242. Ibid, f. 247
- 243. Ibid, f. 247v
- 244. Ibid; TNA WORK 4/21 (minutes for 15 May 1815)
- 245. TNA WORK 4/23, f. 307
- 246. TNA WORK 1/6, f. 463
- 247. TNA LC11/22
- 248. Ibid
- 249. Ed. Cave, *Diary of Joseph Farington*, vol. 14 (January 1816-December 1817), p. 4871
- 250. See, for instance: *Stamford Mercury*, 19 July 1816, p. 4
- 251. TNA WORK 1/7, p. 449
- 252. TNA WORK 19/11/5 (letter of 8 July 1817)
- 253. TNA LC11/26
- 254. TNA LC11/28
- 255. TNA WORK 1/9, p. 43
- 256. Ibid
- 257. Ibid, pp. 43-44
- 258. Ibid, p. 68. This letter seems to be dated 8 August 1818 (i.e. before Stephenson sent his letter of 10 August to the Treasury). However, it begins: 'In answer to your letter dated 10 inst. Enclosing copy of one from Sir B Bloomfield'. This makes it clear that it is a response to Stephenson's letter of the 10 August.
- 259. TNA WORK 1/9, pp. 59-61
- 260. Ibid, pp. 61-2
- 261. TNA WORK 19/11/5, f. 41
- 262. Ibid, f. 39

263. Ibid
264. See: Rhodri Liscombe, 'Economy, character and durability: specimen designs for the Church Commissioners, 1818', *Architectural History*, vol. XIII (1970), pp. 43-57
265. Ibid, p. 46
266. Nash's first two specimen designs were later completely reworked, and became All Souls, Langham Place (completed 1824) and St Mary, Haggerston (1825-7, demolished).
267. TNA WORK 19/11/5, f. 41
268. *Morning Chronicle*, 2 September 1818, p. 3
269. *Morning Advertiser*, 2 September 1818, p. 2
270. TNA WORK 4/23, f. 269 and f. 307 (also: WORK 1/9, p. 111)
271. *The British Press*, 7 October 1818, p. 2; *Morning Post*, 14 October 1818, p. 3
272. TNA WO 44/642 (letter of 23 October 1818)
273. Ibid
274. TNA WORK 19/11/5, f. 43 (also: WORK 1/9, p. 108)
275. Ibid (letter of 2 November 1818) (also: WORK 1/9, p. 110)
276. *Evening Mail*, 16 November 1818, p. 2
277. TNA LC11/18
278. Bridget Cherry and Nikolaus Pevsner, *Buildings of England, London 2: South* (London, 1994 reprint), pp. 286-290; O. F. G. Hogg, *The Royal Arsenal. Its Background, Origin, and Subsequent History*, 2 vols (Oxford, 1963); W. T. Vincent, *The Records of Old Woolwich*, 2 vols (London, 1888-90)
279. Ed. Guillery, *Survey of London, Vol. 48: Woolwich*, pp. 328-332
280. See: W. Porter, *History of the Corps of Royal Engineers*, 2 vols (Chatham, 1889); ed. Major D. P. Aston, *A Short History. The Royal Engineers* (Chatham, 1993)
281. TNA MPHH1/136 (map of Woolwich and Charlton Commons and the Barrack Field used as Exercising Ground, 1813)
282. *Records of the Royal Military Academy, 1741-1892* (Woolwich, 1895), p. 1

283. Hogg, *The Royal Arsenal*, pp. 345-350
284. Ian MacRea, 'Captain Congreve in North America', paper presented to the Royal Artillery Historical Society, 13 October 2004, Woolwich, n. p. (<http://www.army.mod.uk/documents/general/autumn2004congrevetext1.doc>)
285. Letter from James Pattison to the Board of Ordnance, 23 January 1775, in 'Manuscript Book of Collected Military Papers on Artillery Matters, vol. II: 1780-1800': Firepower Archives, Royal Artillery Museum (ref. RAHT Collection RA/20)
286. Ibid
287. Letter from George Williamson to the Board of Ordnance, 30 July 1775, in 'Manuscript Book of Collected Military Papers on Artillery Matters, vol. II: 1780-1800': Firepower Archives, RAM (ref. RAHT Collection RA/20)
288. J. P. Kaestlin, *Catalogue of the Museum of Artillery in the Rotunda at Woolwich* (London, 1963), p. iv
289. Major R. St G. G. Bartelot, RA, 'A Concise History of the Rotunda Museum (1778-1978)', *Journal of the Royal Artillery*, vol. 105 (September 1978), no. 2, p. 104 (citing a letter from George III to Lord Townshend of 15 May 1778)
290. Letter of 17 June 1778 in: Francis Duncan, *History of the Royal Regiment of Artillery*, 2nd edn (London, 1874), vol. 1, p. 307
291. Vincent, *The Records of Old Woolwich*, vol. 2, p. 413
292. The Repository building is depicted on a plan of 1781: TNA MPH 1/752 ('Plans of the different Apartments in the Royal Military Repository which His Majesty was pleased to approve of the 21 May 1781')
293. Vincent, *The Records of Old Woolwich*, vol. 2, p. 413
294. Letter from Captain William Grant, 5 December 1780, in 'Manuscript Book of Collected Military Papers on Artillery Matters, vol. II: 1780-1800': Firepower Archives, RAM (ref. RAHT Collection RA/20)
295. Letter from Major Benjamin Stehelin, RA, to Captain William Congreve, 4 May 1781, and letter from Lieutenant John Macleod, RA, to Captain William Congreve, 21 April 1781 – both in: 'Manuscript Book of Collected Military Papers on Artillery Matters, vol. II: 1780-1800': Firepower Archives, RAM (ref. RAHT Collection RA/20)
296. MacRea, 'Captain Congreve in North America', n. p.
297. Porter, *History of the Corps of Royal Engineers*, vol. 2, p. 172

298. Kaestlin, *Catalogue*, p. iv
299. Ibid, p. iii
300. Ibid
301. TNA WO 47/93, p. 427 (Board of Ordnance minutes)
302. Letter from James Pattison to Captain William Congreve, 22 April 1781, in 'Manuscript Book of Collected Military Papers on Artillery Matters, vol. II: 1780-1800': Firepower Archives, RAM (ref. RAHT Collection RA/20)
303. Kaestlin, *Catalogue*, p. v
304. TNA WORK 1/9, p. 62
305. TNA WORK 4/23, f. 269 and f. 307 (also: WORK 1/9, p. 111); TNA WO 44/642, pp. 373-5 (statement of 24 June 1819 from Lieutenant-Colonel John J. Jones to R.H. Crewe)
306. TNA WO 44/642, pp. 387-8 (Ordnance Correspondence, Laboratories, letter from Fitzroy Somerset to R. H. Crewe, 15 May 1820)
307. *Public Ledger and Daily Advertiser*, 3 June 1820, p. 2
308. *Evening Mail*, 16 November 1818, p. 2
309. TNA WO 44/642, p. 358 (letter from Sir William Congreve to R. H. Crewe, 7 December 1818)
310. Ibid, p. 361 (letter of 14 April 1819 from Lieutenant-Colonel John J. Jones to R. H. Crewe)
311. Ibid
312. Ibid, p. 359 (letter of 7 December 1818 from Sir William Congreve to R. H. Crewe); ibid, p. 364 (letter of 13 May 1819 from John J. Jones to Crewe); ibid, pp. 366-7 (letter of 27 May 1819 from T. Hanway to Crewe); ibid, pp. 368-70 (letter of 14 June 1819 from Congreve to Crewe)
313. Ibid, p. 369 (letter of 14 June 1819 from Sir William Congreve to R. H. Crewe)
314. Ibid, pp. 373-5 (statement of 24 June 1819 from Lieutenant-Colonel John J. Jones to R.H. Crewe). This amount included the covering of the roof, the laying of the floors and the painting of the interior.
315. Ibid, p. 377 (supplementary estimate of 24 June 1819)

316. Ibid, pp. 373-5 and pp. 377-8
317. Ibid, pp. 379-80 (letter of 1 July 1819 from Lieutenant-Colonel John J. Jones to R. H. Crewe)
318. Ibid, pp. 382-3 (letter of 21 October 1819 from Lieutenant-Colonel John J. Jones to R. H. Crewe)
319. It should be noted that the date of this column has been the source of some doubt. For example, Robert Sears, writing in 1847, stated that ‘The building, having a tent-like form, was at first wholly unsupported in the centre; but not being considered perfectly secure, a pillar was subsequently erected as a central support’: Robert Sears, *A New and Popular Pictorial Description of England, Scotland, Ireland, Wales and the British Islands* (New York, 1847), p. 314. However, J. P. Kaestlin, in his MS notes for his catalogue of 1963, was clear that the central pillar had been erected ‘during the winter of 1819, after the structure was reassembled and boarded over’: ‘Tale of a Tent’, Firepower Archives, RAM
320. *The Sun*, 18 November 1864, p. 1
321. TNA WO 44/642, pp. 382-3 (letter of 21 October 1819 from Lieutenant-Colonel John J. Jones to R. H. Crewe)
322. Ibid, p. 385 (letter of 4 May 1820 from Lieutenant-Colonel John J. Jones to R. H. Crewe)
323. TNA WO 49/143 (Estimate of Works, Woolwich, 1821); TNA WO 49/144 (Estimate of Works, Woolwich, 1822)
324. Charles Dupin, *View of the History and Actual State of the military force of Great Britain*, vol. 1 (London, 1822), p. 109. The authors are grateful to Jonathan Clarke for this reference.
325. Kaestlin, *Catalogue*, p. ii; Ken Timbers, ‘The Museum of Artillery in the Rotunda’, *Journal of the Ordnance Society*, vol. 6 (1994), p. 86 (‘The weight of the new roof meant that it could no longer be supported simply by the cantilever effect of Nash’s clever original design’)
326. TNA WORK 4/23, p. 307 (18 December 1818). This document records a payment of just over £43 received from Mr John Holroyd ‘for old lead taken off the Polygonal building in Carlton House Gardens, to go in aid with the money to be received of the Ordnance Office to defray the expense of taking down the same’.
327. TNA WO 44/642, pp. 376-8
328. *Hampshire Chronicle*, 3 June 1822, p. 3

329. TNA WO 55/2498 ('A Statement of the Storehouses, Magazines, Workshops &c the Property of the Ordnance at Woolwich shewing their dimensions, the materials with which they are constructed, and the purposes to which they are applied', 1821)
330. TNA WO 55/2703 (Woolwich 1830); WO 55/2864 (Woolwich 1841); WO 55/3034 (Woolwich 1851)
331. See, for example, the *Saturday Magazine*, no. 415, 22 December 1838, pp. 233-5
332. See also: *ibid*, p. 415
333. Karl Friedrich Schinkel, 'The English Journey'. *Journal of a Visit to France and Britain in 1826*, eds David Bindman and Gottfried Riemann (New Haven and London, 1993), pp. 90-92. For the original German, see: Schinkel, *Die Reise nach Frankreich und England im Jahre 1826*, ed. Reinhard Wegner (Munich and Berlin, 1990), p. 122
334. *Kentish Independent*, 17 October 1857, p. 1, and 24 October 1857, p. 1
335. *Dublin Evening Mail*, 7 June 1841, p. 1
336. *Illustrated Times*, 23 November 1861, p. 10
337. *The Kentish Independent*, 3 May 1862, p. 1; *ibid*, 30 May 1863, p. 1
338. *Evening Standard*, 16 May 1864, p. 5
339. TNA WO 44/642, pp. 382-3
340. These photographs are now among the collections of the Historic England Archive.
341. Duncan, *History of the Royal Regiment of Artillery*, vol. 1, p. 307
342. Sarah Newsome, Jonathan Millward and Wayne Cocroft, *Repository Woods, Woolwich, Greater London: An Archaeological Survey of the Royal Military Repository Training Grounds* (English Heritage Research Report series, no. 14-2009)
343. TNA WO 47/81, p. 391 (minute books of the Board of Ordnance, 7 May 1773)
344. Letter of 25 January 1775 from General James Pattison to the Board of Ordnance, in 'Manuscript Book of Collected Military Papers on Artillery Matters, vol. II: 1780-1800': Firepower Archives, RAM (ref. RAHT Collection RA/20)
345. Sarah Newsome, pers. comm. The ponds which pre-existed the Royal Military Repository are thought to have been those located immediately to the west and north of where the gun park is today; they appear to have been associated with Bowater Farm.

346. E. W. Brayley, *The Beauties of England and Wales, vol. 7: Hertford, Huntingdon and Kent* (London, 1808), p. 537
347. TNA MPHH 1/244 ('Plan shewing the Ordnance Ground at Woolwich, 1804'); MR 1/1381 (map of Ordnance property, 1810); MFQ 1/1267 (Plan of the Lands and Buildings Owned and Hired by Ordnance, Woolwich, 1811). The gatehouse, 1 Repository Road, has been the subject of some English Heritage research (HE London Historians' file GRE 49). Many thanks to colleagues in the Survey of London for this information.
348. TNA WO 47/2573, p. 1047 (extracts of minutes of the Board of Ordnance, 16 September 1802)
349. TNA WO 44/642, pp. 358-9 (letter of 7 December 1818 from Sir William Congreve to R. H. Crewe)
350. Ibid
351. Ibid, pp. 368-70 (letter of 14 June 1819 from Sir William Congreve to R. H. Crewe)
352. TNA MFQ1/1274 (Plan explanatory of the Return 'of all the Lands & Buildings belonging to the Ordnance at Woolwich' made in Compliance with the Master General's and Board's order, dated 6 June 1821)
353. Dupin, *View of the History and Actual State of the military force of Great Britain*, p. 109
354. TNA WO 55/2703 (Plan of the Rl. Artillery & Rl. Sappers Barracks, Woolwich Common, the Veterinary & Hospital Establishment, the Repository, & R.M. Academy &c. to accompany the Returns ordered by the Board's circular of 14 May 1830)
355. TNA WPHH/1/136 (Plan of the Ordnance Lands at Woolwich, June 1813)
356. TNA WO 44/642, p. 388 (note dated 17 May 1820, appended to letter of 15 May 1820 from Fitzroy Somerset to R. H. Crewe)
357. The memorial has been dated to June 1845, but an article in the *West Kent Guardian*, 26 April 1845, p. 5, refers to the 'granite testimonial recently erected to the late Major-General Sir Alexander Dickson, G. C. B., near the Rotunda at Woolwich', which had 'just received its bronze details'. Its depiction in Grant's view of 1844 (see Fig. 23) either shows the monument as intended to be completed in coming months or is evidence that it is slightly earlier in date. The Dickson monument was moved in 1912 to 'a more central position on the front parade opposite the Royal Artillery Barracks'; a formal inauguration was performed on 10 June of that year: *The Times*, 11 June 1912, p. 14. Much more recently, in 2007, it was transferred from Woolwich to Larkhill in Wiltshire.

358. Sir William Congreve, *Detail of the Different Models, Arms, Trophies and Military Machines of every description contained in the Rotunda and the Grounds of the Royal Military Repository at Woolwich* (London, 1822), pp. 1-2
359. Kaestlin, *Catalogue*, p. vii
360. 'Photography Applied to Military Purposes', in *The Photographic News*, ed. Sir William Crookes, 24 December 1858, p. 184. See also: J. Spiller, 'Photography in its application to military purposes', *British Journal of Photography*, vol. 10 (1863), pp. 485-7
361. 'Photography Applied to Military Purposes', p. 184
362. Peter Jackson, *George Scharf's London. Sketches and Watercolours of a Changing City, 1820-50* (London, 1987), p. 108
363. The view was published in *The Historic Times* in July 1849.
364. J. H. Lefroy, *Official Catalogue of the Museum of Artillery in the Rotunda* (London, 1864), p. xi
365. *The Visitor's Guide to the Sights of London* (London, 1844), p. 30
366. Ibid, pp. 29-30
367. Ibid, pp. 30-1
368. *The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge*, vol. 27 (London, 1843), p. 559
369. Lefroy, *Official Catalogue*, p. xi
370. Kaestlin, *Catalogue*, p. vii
371. *Saturday Magazine*, 22 December 1838, p. 234; see also *The Penny Magazine of the Society for the Diffusion of Useful Knowledge*, 23 March 1839, pp. 105-6
372. *The Visitor's Guide to the Sights of London*, p. 29
373. TNA WO 33/9, p. 238 (Ordnance Select Committee minutes, 19 November 1859)
374. *Records of the Royal Military Academy, 1741-1892* (London, 1895), pp. 143-4
375. R. H. Vetch, 'Lefroy, Sir John Henry (1817-1890)', rev. Roger T. Stearn, *Oxford Dictionary of National Biography* (Oxford, 2004); online edn, January 2008
376. Kaestlin, *Catalogue*, p. viii; Colonel Hugh C. B. Rogers, *Artillery through the Ages* (London, 1971), p. 93 and p. 96

377. Kaestlin, *Catalogue*, p. viii
378. *The Kentish Independent*, 17 October 1857, p. 1; *ibid*, 24 October 1857, p. 1
379. It should be noted that 'The Rotunda' – a document of c. 1975 which accompanied an application (dated 15 January 1975) for a Heritage Year Award, and now held in the Firepower Archives (Royal Artillery Museum) – states that the lead roof covering had been 'substantially repaired in 1856'. The source for this statement is unknown. It may be that work began in 1856, explaining the reference to 'completing' in the newspaper notices, but it was surely not simply a process of repair.
380. *Nottinghamshire Guardian*, 25 July 1861, p. 2
381. *Illustrated Times*, 23 November 1861, p. 10
382. *The Kentish Independent*, 3 May 1862, p. 1
383. *Ibid*, 30 May 1863, p. 1
384. TNA WO 33/10, f. 390 (Abstract of Proceedings of the Ordnance Select Committee for the year 1860 [*sic*], printed and indexed, Army Vote 13, Civil Buildings 1861-62, p. 4)
385. TNA WO 33/13, f. 364 (Ordnance Select Committee Minutes, 30 December 1863)
386. *Evening Standard*, 16 May 1864, p. 5
387. For the material, see, for instance: *Sheffield Independent*, 23 August 1851, p. 7. For the stamp on the sheets, see: *Dublin Evening Mail*, 7 June 1841, p. 1
388. Vincent, *The Records of the Woolwich District*, p. 414
389. TNA MPH1/362 (5) (Plans of the Royal Military Repository, surveyed 1867, published 1868, revised 1888)
390. 'The Rotunda at Woolwich', *Chambers's Journal* (11 July 1868), p. 446
391. *Ibid*, p. 448
392. Lefroy, *Official Catalogue*, p. 1
393. *Ibid*, pp. 1-2
394. TNA SUPP 6/3 (Abstracts of Proceedings of the Ordnance Select Committee, 1 October-31 December 1861, minute 5289, 6 November 1861)

395. Ibid (Abstracts of Proceedings of the Ordnance Select Committee, 1 January-31 March 1861, minute 3232, 1 February 1861)
396. Kaestlin, *Catalogue*, p. x
397. Ibid, p. viii
398. J. P. Kaestlin, 'Tale of a Tent', MS notes: Firepower Archives, RAM; Royal Artillery Committee Minutes, 6 August 1870: Firepower Archives, RAM
399. Ernest R. Suffling, 'Around Woolwich Rotunda', *Chambers's Journal*, 1901-2, p. 398
400. Ken Timbers, 'The Museum of Artillery in the Rotunda', *Journal of the Ordnance Society*, vol. 6 (1994), p. 88
401. *Official Catalogue of the Museum of Artillery in the Rotunda, Woolwich* (London, 1934), p. 1. See also: Charles John Ffoulkes, *Arms and the Tower* (London, 1939), pp. 178-9, and J. P. Kaestlin, 'The Spoilation of the Rotunda', 1963 typescript: Firepower Archives, RAM
402. Kaestlin, 'Tale of a Tent', MS notes: Firepower Archives, RAM
403. Kaestlin, *Catalogue*, p. xii
404. E. F. E. Jefferson, *The Woolwich Story, 1890-1965* (London, 1970), p. 290; Kaestlin, 'Tale of a Tent', MS notes: Firepower Archives, RAM
405. The Royal Artillery Institution building was not so fortunate: it was destroyed by a German bomb on 2 November 1940. With it were destroyed all the stocks of catalogues for the Rotunda and many of the records about its history.
406. Sam Price Myers, *London South of the River* (London, 1949), p. 55
407. Kaestlin, *Catalogue*, p. xii
408. *Kentish Times*, 7 August 1964, p. 108
409. Bartelot, 'A Concise History of the Rotunda Museum', pp. 110-111
410. Drawings relating to this scheme are held in the Plans Room of the Historic England Archive (cabinet 17, drawer 9). We are grateful to colleagues in the Survey of London for bringing these drawings to our attention.
411. C. J. Evans, 'Cast-bronze Cannon', *Foundry Trade Journal* (7 October 1971), p. 467
412. Bartelot, 'A Concise History of the Rotunda Museum', p. 111
413. Kaestlin, *Catalogue*, p. xiii

414. Bartelot, 'A Concise History of the Rotunda Museum', p. 113
415. Ibid, p. 113
416. Major-General Basil Hughes, 'The Museum of Artillery in the Rotunda at Woolwich', *Museums Journal*, vol. 74, no. 4 (March 1975), p. 177
417. A large collection of the Dove Brothers' drawings survive in the RIBA Drawings Collection. Sadly, however, the drawings related to the Rotunda are not among them. Furthermore, PSA documentation does not seem to have survived the organisation's break up in the early 1990s, aside from photographs, which are held in the Historic England Archive. Evidence for the restoration works, therefore, comes solely from papers in the Firepower Archives (RAM), which, again, are pretty slender, and do not seem to include architectural drawings (although such drawings did form part of the archives in the mid-1990s; they are referred to in notes made by Roger Bowdler which form part of the HE London Historians' file GRE 49).
418. Hughes, 'The Museum of Artillery in the Rotunda at Woolwich', p. 177
419. 'The Rotunda', description accompanying application for Heritage Year Award, c. 1975: Firepower Archives, RAM
420. Ibid
421. Record of meeting held at the Rotunda Museum on 13 August 1973, p. 3: Firepower Archives, RAM
422. 'The Rotunda', description accompanying application for Heritage Year Award, c. 1975: Firepower Archives, RAM
423. Ibid
424. Ibid
425. Ibid
426. Ibid
427. 'Programme for completion of contract', Rotunda site meeting of 27 February 1974, appendix A; see also programme agreed at meeting of 3 January 1974: Firepower Archives, RAM
428. 'The Rotunda', description accompanying application for Heritage Year Award, c. 1975: Firepower Archives, RAM

429. 'Programme for completion of contract', Rotunda site meeting of 27 February 1974, appendix A: Firepower Archives, RAM. See photographs in the Historic England Archive.
430. 'The Rotunda', description accompanying application for Heritage Year Award, c. 1975: Firepower Archives, RAM
431. 'Programme for completion of contract', Rotunda site meeting of 27 February 1974, appendix A; see also programme agreed at meeting of 3 January 1974: Firepower Archives, RAM
432. Bartelot, 'A Concise History of the Rotunda Museum', p. 113
433. 'The Rotunda', description accompanying application for Heritage Year Award, c. 1975: Firepower Archives, RAM
434. Bartelot, 'A Concise History of the Rotunda Museum', p. 113
435. Hughes, 'The Museum of Artillery in the Rotunda at Woolwich', p. 177; Bartelot, 'A Concise History of the Rotunda Museum', p. 113
436. Cherry and Pevsner, *London 2: South*, p. 290
437. Myers, *London South of the River*, p. 55. Earlier, W. T. Vincent had been more dismissive of the Rotunda's architectural integrity, though he too mentioned the ropes. He wrote in 1888-90 that 'The only portion remaining of the original materials are the ropes which radiate from the crown, and support the roof. These were formerly gilt, each with gold to the value of £15, now under a coat of paint': Vincent, *Records of the Woolwich District*, p. 414
438. Hughes, 'The Museum of Artillery in the Rotunda at Woolwich', p. 177
439. E. F. E. Jefferson, *The Woolwich Story 1890-1965* (London, 1970), p. 290
440. Bartelot, 'A Concise History of the Rotunda Museum', p. 113
441. Hughes, 'The Museum of Artillery in the Rotunda at Woolwich', p. 178
442. Bartelot, 'A Concise History of the Rotunda Museum', p. 104
443. Ibid; Report by John Pound, 'Museum of Artillery Woolwich', 27 April 1973, p. 1: Firepower Archives, RAM
444. 'Museum Manoeuvre', *Architects' Journal*, March 1989, vol. 189, pp. 26-9
445. Gordon Winter, 'Gunners' Target: New Museum', *Country Life*, 6 June 1991, p. 111
446. Leaflet of 1995 on Historic England London Historians' file GRE 49

447. Firepower website, www.firepower.org.uk/about/ (acc. 19 February 2009)
448. Articles published within the last ten years include that by Jonathan Clarke, 'Cones, not Domes: John Nash and Regency structural innovation', *Construction History*, vol. 21 (2005-6), pp. 43-63
449. For example, J. P. Kaestlin noted 'the central pillar was in fact erected during the winter of 1819, after the structure was reassembled and boarded over, to take the additional weight of a lead covering': Major J. P. Kaestlin, 'Tale of a Tent', Firepower Archives, RAM (ref. MD 939/17 (2), p. i)
450. The documented decision of April 1819 that, 'for the perfect security of the building ... in the exposed situation...' '...the walls should be of greater strength than in the sheltered spot where it originally stood' may have been accompanied by a similar (but unrecorded) one to erect a central column, on similar grounds. *The Penny Magazine* (23 March 1839), in its brief description of the building, offers some corroboration for this: 'At first [i.e. at Carlton House] wholly unsupported in the centre, but not being considered perfectly secure, a pillar was subsequently erected as a central support'.
451. *Encyclopædia Britannica*, 2005: 'building construction', Encyclopædia Britannica Online, <http://search.eb.com/eb/article-60125>
452. See James W. P. Cambell and Robert Bowles, 'The Construction of the New Cathedral' in *St Paul's: The Cathedral Church of London 604-2004*, eds Derek Keene, Arthur Burns and Andrew Saint (London, 2004), pp. 215-17; George L. Hersey, *Architecture and geometry in the age of the Baroque* (London, 2000), pp. 69-70 and pp. 134-137
453. e.g.. E. Weisstein, 2005. <http://mathworld.wolfram.com/Catenary.html>; www.2dcurves.com/exponential/exponentialhc.html
454. D. T. Yeomans, *The Trussed Roof: its history and development* (Aldershot, 1992), pp. 131-35
455. Plausibly, the boarded cladding, nailed onto the upper chords, and the canvas covering may have also helped restrict outward spread of the roof structure through tensile membrane action.
456. TNA WORK 6/27, f. 239
457. Yeomans, *The Trussed Roof* (Aldershot, 1992), p. 171
458. For instance, marquees including a giant bell tent were erected for an event for the Kentish military volunteers at Mote Park in Kent in 1800, in the presence of the royal family. See: Clarke, 'Cones, not Domes', Fig. 15

459. Keith Raynor, 'British Army Bell Tents of the Napoleonic Period', *Napoleonic Notes and Queries*, No. 5 (1992), pp. 20-28
460. David T. Yeomans, 'Early carpenters' manuals 1592-1820', *Construction History*, vol. 2 (1986), pp. 13-33
461. Francis Price, *The British Carpenter, or A Treatise on Carpentry*, (London, 2nd ed., 1735), p. 32
462. Peter Nicholson, *The carpenter and joiner's assistant ... To which are added, examples of various roofs, etc.* (London, 1797), p. 66
463. Editions of 1805, 1810, 1815 and 1826
464. Michael Angelo Nicholson, *The Carpenter and Joiner's Companion in the geometrical construction of working drawings ... Improved from the original principles of ... P. Nicholson* (London, 1826)
465. *Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge* (London, 1843), p. 147
466. Summerson, *The Life and Work of John Nash*, p. 10
467. J. Nash, autographed letter to the Earl of Caledon, Co. Tyrone, dated 25 November 1815: <http://manuscripts.co.uk/stock/20442.HTM>
468. Appendix to the second report from the Select Committee on Windsor Castle and Buckingham Palace, 14 October 1831, as quoted in R. J. M. Sutherland, 'The Age of Cast Iron 1780-1850: Who Sized the Beams?', *The Iron Revolution: Architects, Engineers and Structural Innovation 1780-1880*, Essays to Accompany an Exhibition at the RIBA Heinz Gallery, ed. Robert Thorne (June/July 1990), p. 8
469. John Summerson, 'Introduction' in Michael Mansbridge, *John Nash: A Complete Catalogue* (New York, 1991), p. 15
470. Hunt, *Exemplars of Tudor Architecture*, p. 97
471. For a biographical sketch, see H. M. Colvin, *A Biographical Dictionary of British Architects 1600-1840* (3rd ed., London, 1997), p. 707. Of this Nixon (1760-1824), *The Carlisle Journal* of 6 March 1824 noted: 'At Chalk Lodge on the 2nd instant Mr Wm. Nixon, in the 64th year of his age; his mild and unassuming deportment through life, and his excellence as an architect, rendered him one of the brightest ornaments of society, and an honour to Cumberland'.
472. Hunt, *Exemplars of Tudor Architecture*, p. 97. There was no mention of Nixon in the final edition of the book (London, 1841).
473. W. Holden, *Holden's Annual Directory for London* (London, 1808)

474. TNA WORK 19/11/5, f. 2 (4 March 1815)
475. TNA PCC B 11/1725. 'the probate of the late Mr William Nixon's will' was recorded as being deposited with the Office of Works on 7 May 1827: TNA WO 4/28 p. 283
476. Summerson, *The Life and Work of John Nash*, p. 106
477. Colvin, *A Biographical Dictionary of British Architects 1600-1840*, p. 707; ed. Colvin, *History of the King's Works, Vol. VI*; Malcolm Pinhorn, *The Diaries of John Nash architect: 1832 and 1835, Part Two, introduced by John Summerson, edited and annotated by Malcolm Pinhorn* (Calbourne, 2000), pp. 122-3
478. TNA WORK 19/11/5, f. 39
479. Treve Rosoman, 'Nicholson, Peter (1765–1844)', *Oxford Dictionary of National Biography*, Oxford University Press, 2004: <http://www.oxforddnb.com/view/article/20147> and pers comm.
480. See Patrick Conner, 'Unexecuted designs for the Royal Pavilion at Brighton', *Apollo*, vol. 107, no. 193 (March 1978), pp. 192-199
481. See, for instance: Gervase Jackson-Stops, John Nash, *Views of the Royal Pavilion* (London, 1991), p. 28
482. E. W. Brayley, *Illustrations of Her Majesty's Palace at Brighton* (London, 1838), p. 16
483. Dora Wiebenson, 'The Two Domes of the Halle au Blé in Paris', *The Art Bulletin*, vol. 54 (1973), pp. 262-79
484. W. L. Beiswanger, 'Jefferson and the Art of Roofing', *The Chronicle*, vol. 58 no. 1 (2005), pp. 18-25
485. For an appraisal of Nash's structural iron and timberwork at Brighton Pavilion, see: John Dinkel, 'Royal restoration', *Architects' Journal*, vol. 186, no. 27 (8 July 1987), pp. 24-27; and Edward Diestelkamp, 'Architects and the Use of Iron', in *The Iron Revolution: Architects, Engineers and Structural Innovation 1780-1880*, Essays to Accompany an Exhibition at the RIBA Heinz Gallery, ed. Robert Thorne (June/July 1990)
486. I am grateful to Dr Steven Brindle for bringing this (demolished) building to my attention.
487. Donald Mallett, *The greatest collector: Lord Hertford and the founding of the Wallace Collection* (London, 1979), p. 25
488. Certainly Burton used laminated timber for the dome of the Colosseum in Regent's Park (1824-27, demolished 1875). Although no mention of the technique is made

in Ralph Hyde's *The Regent's Park Colosseum* (London, 1982), see 'A Chapter on Curved Beams' in *The Building News*, 22 March 1878, p. 286

489. TNA MPHH 1/571 (An Accurate Survey of the Ground adjoining to the Barrack Field at Woolwich, on which the Royal Artillery was Reviewed the 9th July 1788); TNA MPH 1/235 (Survey made by some of the Gentlemen Cadets of the Upper Academy under the Direction of Mr. [Isaac] Landman, Professor of Fortification to the Royal Military Academy': plan of the Review Ground west of Barrack Field, Woolwich, Kent 1788)
490. S. Marsh, 'Woolwich' in ed. Peter Dietz, *Garrison: Ten British Military Towns* (London, 1986), p. 108; Vincent, *The Records of Old Woolwich*, vol. 2, p. 413
491. TNA MPH 1/562 (Survey of Several Fields belonging to Edwd Bowater Esqr By Order of the Right Honble the Board of Ordnance, 1st March 1773); TNA WO 47/81 (Minutes of the Board of Ordnance, 16 March 1773)
492. TNA WO 47/81 (Minute Books of the Board of Ordnance, 7 May 1773)
493. Letter of 25 Jan 1775 from General James Pattison to the Board of Ordnance: Firepower Archives, RAM (ref. RAI 53/111/4)
494. Peter Guillery, pers. comm.
495. Duncan, *History of the Royal Regiment of Artillery*, p. 307
496. TNA MPH 1/752 (Plans of the different apartments of the Royal Military Repository which His Majesty was pleased to approve of the 21st of May 1781)
497. TNA MPHH 1/180 (Woolwich Warren [now in London Borough of Greenwich]; sections of Woolwich and Charlton Commons, 1803). An OS Surveyors map of 1799 suggests an even earlier date. It should be noted that the map evidence appears to suggest a gap of at least seven years between approval and construction.
498. TNA WO/47/2,573, p. 1047 (Extracts of Minutes of the Board of Ordnance, 16 September 1802)
499. TNA WO55/2355 (Ordnance Office Statement of Lands and Buildings, 1 July 1806)
500. TNA MPHH 1/189/4 (Rough Plan of Ground in the Vicinity of the Barrack Field Woolwich, 1808); Greenwich History Centre, *Plan shewing the Ordnance Ground and parts adjacent at Woolwich*, March 1810
501. TNA WO 44/642, ff. 358-9 (letter of 7 December 1818 from Sir William Congreve to R. H. Crewe)

502. Letter from George III to Lord Townshend 15 May 1778, cited in: Bartelot, 'A Concise History of the Rotunda Museum (1778-1978)', *Journal of the Royal Artillery*, vol. 105 (September 1978), no. 2, p. 104
503. Ibid
504. Kaestlin, *Catalogue*, p. iv; Firepower Archives, RAM, ref. AL/27
505. TNA MPHH 1/189/4
506. TNA MPH 1/507/3-4 (Plan showing the Buildings wherein the Quick Travelling Mortar Brigades were recently deposited, 1815)
507. Ibid; TNA WO 55/2703 (Ordnance Office Statement of Lands and Buildings, 1830)
508. Brayley, *The Beauties of England and Wales*, vol. 3 [Kent] (London, 1808)
509. TNA MPHH 1/180
510. TNA MPHH 1/189/4; TNA MPH 1/5073-4; Firepower Archives, RAM, ref. AL27/40-48
511. TNA WO 55/756 (letter from R. H. Crewe to Ordnance Office, 19 January 1810)
512. HEA MD 96/124 (plan of the Royal Artillery Barrack Grounds, Woolwich by C. G. Grey 1839); TNA WO 44/642, ff. 358-9 (letter of 7 December 1818 from Sir William Congreve to R. H. Crewe)
513. TNA WO 55/756 (correspondence between Royal Engineers and Office of Ordnance, c. 1809)
514. TNA WO 44/642, f. 358 (letter from Sir William Congreve to R. H. Crewe, 7 December 1818)
515. Ibid, ff. 358-9
516. Firepower Archives, RAM, photograph by J. Spiller, c. 1858, ref. AL112/9
517. Ibid, AL112/7
518. Wayne Cocroft, pers. comm.
519. TNA WO 44/642, ff. 358-9
520. TNA WO 44/642, f. 370 (letter of 18 June 1819 from Sir William Congreve to R. H. Crewe)

521. TNA MFQ1/1274 (Plan explanatory of the Return 'of all the Lands & Buildings belonging to the Ordnance at Woolwich' made in Compliance with the Master General's and Board's order, dated 6 June 1821)
522. TNA WO 55/757 (various letters dating to 1824 between Office of Ordnance and Royal Engineers)
523. TNA WO 55/2703 (Plan of the Rl. Artillery & Rl. Sappers Barracks, Woolwich Common, the Veterinary & Hospital Establishment, the Repository, & R.M. Academy &c. to accompany the Returns ordered by the Board's circular of the 14th May 1830)
524. Firepower Archives, RAM, ref. AL27/14, AL27/35 and AL112/7 (c. 1858)
525. TNA MPH 1/362/4-6 (Royal Military Repository, Woolwich, surveyed 1867 under the direction of Lieutenant Colonel John Bayly, RE, by the Ordnance Survey)
526. TNA MPH 1/362/4-6; Ordnance Survey 1st Edition 25 inch, 1869
527. Firepower Archives, RAM, ref. AL27/34
528. TNA MPH 1/362/4-6; Ordnance Survey 1st edition 25 inch map of 1869; Firepower Archives, RAM, ref. AL27
529. HEA MD 96/124; Ordnance Survey 1st edition 25 inch map, 1869
530. For further details see Sarah Newsome, Jonathan Millward and Wayne Cocroft, *Repository Woods, Woolwich, Greater London: An Archaeological Survey of the Royal Military Repository Training Grounds* (English Heritage Research Report series, no. 14-2009)
531. Congreve, *Detail of the Different Models, Arms, Trophies and Military Machines of every description contained in the Rotunda and the Grounds of the Royal Military Repository at Woolwich*, pp. 1-2
532. *Saturday Magazine*, 22 December 1838; see also: *The Penny Magazine of the South for the Diffusion of Useful Knowledge*, 23 March 1839
533. *The Visitor's Guide to the Sights of London*, p. 29
534. Sears, *A New and Popular Pictorial Description of England, Scotland, Ireland, Wales and the British Islands*, p. 312
535. 'Photography Applied to Military Purposes', in *The Photographic News*, ed. Sir William Crookes, 24 December 1858, p. 184
536. Firepower Archives, RAM, ref. AL27 and AL112

537. TNA MPHH 1/362/4-6
538. Kaestlin, *Catalogue*, p. vii
539. Ed. H. D. Buchanan-Dunlop, *Records of the Royal Military Academy, 1741-1892* (London, 1895), p. 91
540. TNA MPHH 1/362/4-6
541. HEA MD 96/124; OS 1st edition 25 inch map, 1869
542. Firepower Archives, RAM, ref. AL112
543. M. J. N. Richards in K. Timbers, *The Royal Artillery Woolwich: A Celebration* (London, 2008), pp. 58-59
544. Ken Timbers states 1847 (above), but no reference is given.
545. TNA MPHH 1/362/4-6
546. Burne, *The Royal Artillery Mess*, p. 115
547. Ibid, p. 2; ed. Lady Lefroy, *Autobiography of General Sir John Henry Lefroy, C.B., KCMG, FRS, etc. Colonel Commandant of the Royal Artillery* (London, c. 1895), p. 16
548. Burne, *The Royal Artillery Mess*, p. 102
549. Ibid, p. 3; *Gentleman's Magazine*, March 1842, p. 318
550. TNA MPHH 1/362/4-6; OS 1st edition 25 inch 1869; Firepower Archives, RAM, ref. AL27/AL112
551. HEA MD 96/124; TNA MPHH 1/362/4-6; OS 1st Edition 25 inch map, 1869
552. OS 1st Edition 25 inch map, 1869
553. TNA WO 33/9, p. 238 (Ordnance Select Committee minutes, 19 November 1859)
554. Firepower Archives, RAM, ref. AL27/AL112
555. Ed. Buchanan-Dunlop, *Records of the Royal Military Academy*, pp 143-4
556. Timbers, *The Royal Artillery Woolwich: A Celebration*, pp. 36, 63
557. Dickens jun., *Dickens's Dictionary of London, 1879: An Unconventional Handbook* (London, 1879)

558. J. Peters in Timbers, *The Royal Artillery Woolwich: A Celebration*, p. 115
559. Firepower Archives, RAM, ref. AL932/19
560. Ordnance Survey 25 inch 2nd edition, 1896, and 3rd edition, 1916
561. HEA RAF LA33/4083 14-AUG-1944
562. HEA RAF 106G/UK/916 6112 11-OCT-1945
563. Timbers, *The Royal Artillery Woolwich: A Celebration*, p. 36
564. Burne, *The Royal Artillery Mess*, p. 77
565. *The Times*, 28 July 1830, p. 2
566. Ibid
567. *The Times*, 25 July 1835, p. 5
568. Ed. Lefroy, *Autobiography of General Sir John Henry Lefroy*, p. 16. Lady Lefroy dates this occasion to 24 June 1835, but seems to have been mistaken. It is most likely that it occurred exactly a month later – when a review certainly took place – though William and Queen Adelaide visited Woolwich once again in August of that year.
569. *The Times*, 25 July 1835, p. 5
570. Ibid, 5 July 1838, p. 5
571. Ibid
572. Bartelot, 'A Concise History of the Rotunda Museum', p. 114
573. *The Times*, 23 May 1836, p. 3
574. Ibid, 5 February 1842, p. 5
575. *Illustrated London News*, 14 October 1843, p. 247
576. Burne, *The Royal Artillery Mess*, p. 115
577. Vetch, 'Lefroy, Sir John Henry', *ODNB*; online edn, January 2008
578. *The Royal Military Academy, and the Artillery and Engineer Services* (London, 1855), p. 10
579. Burne, *The Royal Artillery Mess*, pp. 238-9

580. Suffling, 'Around Woolwich Rotunda', p. 400
581. Report by John Pound, 'Museum of Artillery Woolwich', 27 April 1973, p. 1: Firepower Archives, RAM
582. Dickens jun., *Dickens's Dictionary of London, 1879*, p. 276
583. Ibid, p. 278
584. *The Penny Magazine*, 23 March 1839, p. 106. A similar sentiment was expressed in 1901-2 by Ernest R. Suffling in 'Around Woolwich Rotunda', p. 399: 'We now enter the great Rotunda; and, face to face with its wealth of curious weapons and inventions, we pause in wonder as to how we can inspect everything here in a single afternoon. Then at the very outset we give up the hope of accomplishing so much'.
585. Dickens jun., *Dickens's Dictionary of London, 1879*, p. 278
586. Myers, *London South of the River*, p. 55
587. 'The Rotunda at Woolwich', *Chambers's Journal*, p. 448
588. Jefferson, *The Woolwich Story*, p. 290
589. Vincent, *Records of the Woolwich District*, p. 414
590. Kaestlin, *Catalogue*, p. xiii
591. Bartelot, 'A Concise History of the Rotunda Museum', p. 114
592. Suffling, 'Around Woolwich Rotunda', p. 397
593. Kaestlin, 'Tale of a Tent', MS notes: Firepower Archives, RAM



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