Fig. 1: artist's impression of the New Armouries (left) and Ordnance administrative Office in 1780. The Office was reconstructed after a great fire in 1774 to a design by the Office architect Charles Frederick and the martial arms provided by Elisabeth Coad can be seen in the tympanum over the main entrance on the north side of the building (© Frank Gardiner)

The New Armouries, Tower of London

Geoffrey Parnell

In a recent issue of *London Archaeologist*[1] I drew attention to what I regarded as the notable shortcomings in the Oxford Archaeology/Historic Royal Palaces account of the excavation and interpretation of the Irish Barracks at the Tower of London.[2] In the same report the investigations inside the New Armouries itself, with an historical assessment of the building, are presented. Once again Dr. Jeremy Ashbee struggles with the 'Historical Background',[3] while Julian Mumby provides a readable account of the 'Description of the building'[4] that is brief and provides no information about the architectural context of the structure.

The New Armouries (Fig. 1) is the oldest surviving Office of Ordnance storehouse in the country and its design and construction is, therefore, of some importance in the study of the department's architectural portfolio that continued until 1855 and dissolution at the hands of a vengeful parliament looking for a scapegoat for the shortcomings of the Crimea War. The uniqueness of the New Armouries seems alien to the authors of the report, who make no attempt to place the building in the context of the Ordnance remit and their development at the Tower, while offering no information about the artificers who raised the building and the costs involved. As with the Irish Barracks, the failure to consult the available, very detailed, building accounts, together with the instructions of the Ordnance Board, have led to a published account that is inadequate and at times misleading.

The Buildings and Works of the Office of Ordnance at the Tower

As early as 1454 the Master of the Ordnance was granted 'all manner of housing and other appurtenaunces' set upon the eastern end of the Wharf.[5] This section of the Wharf had been constructed under the supervision of Geoffrey Chaucer, no less, in the final decade of the 14th century and was made exceptionally wide as to suggest that it was intended to accommodate buildings from the outset. Over the years the Ordnance hold on this area was eroded by private development and the extent of this is revealed in an illuminating survey of 1651 where nineteen tenements are recorded on the north side of the road running across the eastern end of the Wharf. They include a barber's shop, a 'smith's shop' a compass maker's shop, a 'pulley maker's shop' a 'strong water shop' a taylor's shop, a tenement called 'the White Tower', a tavern called the 'Three Tuns' and a 'large sailmaker's shop'. On the opposite of the street were a further eighteen houses including a 'large ship-chandler's shop' and various dwelling houses.[6]

The other major area of the fortress that the Ordnance Office occupied, and where life was not troubled by small traders, was immediately north of the White Tower, an area then known as the Green Hill, or the Green. This housed one or more large storehouses in which stands were contrived for Henry VII and his nobles to watch a tournament in May 1501. In 1514 the site received a new storehouse, but by 1533 this was judged to be ready to fall. Consequently yet another building was erected in the years 1545–47 'wherein all the Kinges majestie's store and provicion of artilleries Ordinance and other Municons' could be stored. This storehouse, in plan at least, was the largest building ever erected at the Tower of London. It cost nearly £3,000

and significantly the monies for the work were channelled through Sir Francis Flemyng, Lieutenant of the Ordnance, a new post that had only been created in 1543.[7]

By the reign of Elizabeth I, and with monies being directly voted to the Ordnance by parliament, the Office was beginning to commission its own building works of alteration and repair. The surviving Debenture Books from the final decade of the 16th century show an increasing use of contracted builders and building suppliers. A notable event occurred in April 1610 when the Ordnance Board contracted the master bricklayer, John Morgan and the master carpenter, William Wheateley, to build a new 'powder room' and 'prooffe house' in the Mint.[8] These two buildings, paid for under the privy seal, were possibly the first of their kind to be erected by the Ordnance using its own warranted craftsmen. This work was clearly a substantial operation for the labour and material accounted for nearly £300. It is possible that the facilities were located against the rear of Legge's Mount on the north-west corner of the outer curtain wall, where investigations in 1976 revealed that the open bastion had been enclosed with brick walls and vault. Much of the structure was removed and modified when the Ordnance heightened the great bastion in 1682/3 to accommodate enlarged gun batteries.[9]

In 1636 the Ordnance craftsman were converting part of the White Tower into another powder room[10] and three years later in another move to increase their storage capacity the leading officers of the Ordnance petitioned the Privy Council for permission to convert the 'old hall' into a convenient storehouse for guns, carriages, match and other provisions, at an estimated cost of £300 or £400.[11] Though no locations are given it is tempting to identify this old building as the medieval great hall in Coldharbour.[12] No decision in favour of the Ordnance petition is reflected in the accounts, and in June 1641 the master carpenter, Mathew Banks, was paid £783 08s 04d for constructing a new storehouse in Coldharbour. This was a three-storied, timber building which, with each floor comprising a surface area of 39 squares and a roof containing four principal trusses, perhaps occupied a modest ground plan of say 30ft × 13ft. The account indicates that the storehouse was erected on difficult ground (evidently with archaeological interest) by reason of the 'many vaults being formerly buried there'. The posts supporting the first floor were therefore made to rest on foundations of stone 6ft deep and 4ft square, which in turn were set upon timber piles. A notable feature of the building must have been its very steep roof, which, with 2ft wide eaves, was intended to maximise the storage potential of the attic floor. The storehouse was entered via a pair of great doors with a window set overhead. There were only three other (transom and mullioned) windows

Fig. 2: the New Armouries viewed from the north-west in the 1920s. The original casement windows were replaced with sash opening during the 19th century and the high security brick wall that once screened the entrance and formed a courtyard in front of the building has all but disappeared (© Royal Armouries)

lighting the building, presumably one on each floor. Access between the floors was provided by a pair of 4ft wide staircases, while stores could be hoisted into the upper floors by means of a large crane operated by two men.

By the time of the Restoration the Ordnance had acquired the old medieval hall in Coldharbour and in 1685 finally carried out considerable alterations to improve its storage capacity.[13] However, these works, like those listed above, appear insignificant compared to those involving the New Armouries.

Fig. 3: nineteenth-century cast of the late Tudor/Stuart trophies of arms bearing the Ordnance motto SUA TELA TONANT[I] (i.e 'thundering his arms') (© Royal Armouries)

The Building of the New Armouries
In the wake of the Restoration, and with a determination to recall arms and munitions from the localities, the Privy Council considered the state of the Tower storehouses in March 1661.[14] It is probably as a result of their subsequent deliberations that an important decision was made nearly two years later. A royal warrant dated 17 January 1663 recited:

'Whereas wee have received information of the great want of convenient Roomes in the storehowses belonging to the office of our ordnance within our Tower of London ... Our will and pleasure is ... that the void peece of ground within our said Tower comonly knowne or called by the name of the wardrobe Garden bee assigned ... toward the erecting and building of a Storehowse for laying up our said Armes and provisions'.

The storehouse was ordered to be built 'as soone as the season will permit', and 'to the best convenience and advantage the said ground will afford'.[15] During February and March the first of several imprests of money were made to John Scott, carpenter, and Thomas Norfolk, bricklayer from an enormous sum of £93,897 18 09d that had been advanced to the Ordnance under the privy seal the previous November.[16] The early clearance of the site saw 505 loads of rubbish being carted to the Wharf for disposal.[17] In May 'Traitors bridge Gate', the tunnel through the Wharf before St Thomas's Tower, was ordered to be cleared to enable provisions for the new storehouse to be brought through the watergate and into the basin, while in July the ragstone paving of a road to the new building, and a court before it, was ordered (Fig. 2).[18] Further imprests were made to the mason in August and December, the plasterer, Bartholomew Clarke, in October and the smith, John Wise, in December, by which time the main body of the three-storied building had been raised.[19]

The detailed building accounts that the authors of the HRP/OA report failed to examine are found in the Ordnance Treasurer's Ledgers. Some of the Bill Books for this period are missing, but the Treasurer clearly copied the bill entries as any comparison between the two will demonstrate. The accounts are too long and detailed to be presented here, but the following summary may be helpful.

The largest single payment of £950 07s 02d was made to Thomas Norfolk, a master bricklayer with a long association with the Ordnance and the Tower, that included the conversion of the former royal Wardrobe on the east side of the White Tower into a powder house in 1650. His 'Brickworke in the whole of the building', came to just over 114 Rods and accounted for two thirds of the bill at £640 40s 07d. The tiling of the roof was the second most expensive item at £140 07s 02d.[20]

The master carpenter, John Scott, received two payments: £829 00s 06d for the framing of the building and £428 17s 03d for fitting out the interior,[21] which was one of the final warrants that, together with those relating to the painter, Thomas Bayley and paviour, Richard Williams, was issued in May 1664. Interestingly his first bill includes for the ground floor a payment for '11 whole Poosts or pillars of Oake for supporters of the Summers' priced 11s. each. This refers to the large octagonal columns that support the first floor and feature carved bases with decorative stop-chamfers. The mannerist, almost Tudor-looking, appearance of the pillars has led to suggestions that they might have originated from the buildings of the former royal palace lying to the west of the New Armouries, but the accounts confirm that the were made for the new building. In association with installation of the columns, the mason, Anthony Ellis, provided the 'greate Bases for the Pillows' that support the columns and interestingly provided

Fig. 4: the earliest known photograph of the Tower of London taken from the highest point of Tower Hill. It was taken by the artist and photographer George Hilditch and exhibited at the Society of Arts exhibition in London of 1852; it might have been taken the previous year (© Royal Armouries)

'Purbeck stone for paveing the ffoundation' which indicates, perhaps, concerns about ground conditions.[22]

By July 1664 the principal accounts with the builders had been settled at a cost of just over £4000. Shelves and presses were installed, racks for guns, ladles and sponges erected and hundreds of wooden pins provided to hang holsters. By the autumn 2232 yards of 'Broad Bullrush Matts' had been laid in the 'small Gunn Office Roome', next to the 'View Roome' and six furbishers paid for 'oyleing ffixinge and Cleaneing the Armes', which were removed from the White Tower and old Small Gun Office.[23] A few weeks later on 8 November Pepys surveyed the Tower storehouses in the company of the King and various officials, and considered that 'with the addition of the great Store house' they were 'a noble sight'.

In his description of the building Julian Munby refers to the presence of carved coats of arms mounted on the south side of the storehouse and states that little is known about them; this is not the case. The larger of the two (Fig. 1) was in fact made and installed by Elizabeth Coad for the sum of sixty guineas for the new Ordnance administration office in Coldharbour and after the Board approved her estimate on 31 December 1779.[24] This relatively early Coad Stone device survived the fire that gutted the new building on 23 July 1788 and was moved to a new position overlooking the Thames after the office was converted into a storehouse and given extra floors in 1854. It was moved to its present location after the building was demolished in 1882.

The second device is, in fact, a late 19th-century Portland Stone cast, but is nevertheless of considerable interest (Fig. 3). It comprises a shield bearing the Ordnance arms of three field cannon and three cannon balls, with Cyclops supporters either side wearing Roman armour and carrying hammer and forceps. Beneath the shield a wreath bears the Ordnance motto SUA TELA TONANT[I] ('thundering his arms') and above is a crest comprising a crown with a hand grasping a thunderbolt. The mannerist style of the carving and the early appearance of the guns suggest a 17th-century date, but a late Tudor origin, perhaps coinciding with the formation of the Ordnance Board in 1597, cannot be ruled out. That said, it might be supposed that the original arms embellished the Elizabethan administrative office that stood behind the Chapel of St Peter ad Vincula or the one that replaced it in 1672–3 within the carcass of Anne Boleyn's apartment in Coldharbour.[25]

The New Armouries, so expeditiously erected, has no obvious architectural parallel in the extant remains, or surviving drawings, of post-Restoration Ordnance storehouses. Perhaps the Great Storehouse at Plymouth Citadel, built in stone to a design by Sir Bernard de Gomme in the late 1660s, is the closest contemporary. Although there is a similarity in size (i.e. 100ft × 48ft as compared to the main body of the Tower structure, which is 128ft × 43ft) the Plymouth example has a simple rectangular plan, as opposed New Armouries half H-shaped foot print. The individual form and appearance of Ordnance storehouses at this time reflects the more flexible approach to building design that existed within the department until the setting up of the Ordnance Drawing Room (the genesis of the present Ordnance Survey) in the White Tower annexe in 1716.[26]

Aftermath

In conclusion, it seems quite extraordinary that Historic Royal Palaces has deployed considerable resources on a sequence of

archaeological investigations and documentary research that ended in a published report that is both inadequate and misleading. Further evidence for the lack of understanding of the building that they are responsible for is revealed in the infantile description of the building that lurks in the former Viewing Room area on the ground floor of the storehouse (now a fast-food outlet). It is highly unlikely that HRP will acknowledge any mistakes and despite what has been described on the pages of the *London Archaeologist* their published account will doubtless stand as the principle source of inaccurate reference.

To excavate the site of England's first purposely designed barracks and to doubt the existence of what was actually found is a disturbing achievement. The poverty of the documentary research extends to the New Armouries where even the surviving building accounts were not consulted. As a matter of interest I found them at the old Chancery Lane office of the Public Record Office in the late 1970s before the onset of family history mania and when the building was frequented by wonderful, elderly, academics with satchels and riveting conversations. In the good old days of the old Ancient Monuments Branch of the Department of the Environment (the ancestor of English Heritage) the modest staff was expected to do its own documentary research – a far cry from the workings of Historic Royal Palaces where thousands of pounds are evidently frittered away on consultants who cannot detect the whereabouts of important manuscripts recording the monuments that the quango is responsible for.

Archaeological work at the Tower and the other unoccupied palaces is the responsibility of HRP's Curator's Department. The section was downgraded after Edward Impey was elbowed out a few years ago. The Impey flight was accompanied by some of the more able members of his team and since then the curators have put in a rather lacklustre performance. Nowhere is this better illustrated than at the Tower where serious research and intelligent presentation has given way to a celebration of the 19th-century hoax, with its concentration on prisoners, torture and punishment and endless historic title-tattle that would never have been entertained when the building was managed by a more enlightened and publicly accountable civil service. Meanwhile the mythical ceremonial side of Tower History has been augmented by the invention of a gate-opening farce to entertain and deceive the public.

Pay a visit to the Tower now and you may get caught up in noisy disorder as period-styled actors yell and rush about on asphalt to recreate the drama of Col. Blood interfering with the crown jewels. Walk down the hill from this bizarre scene at the Martin Tower, however, and the remarkable remains of the late-4th-century Roman riverside wall that I had the privilege to excavate in 1976 lie neglected and without any signage (at the time of my flight in January 2009) to inform the visitor of the importance of what he or she can see. To this day the wall remains the latest piece of official Roman military engineering so far identified in the country. I asked one of the less than academically-minded deputy governors in 1994 where the signage panels had gone, only to be told that they were removed because that did not sit well with the new Historic Palaces brand! Sixteen years later the wall was still waiting to be branded.

The lack of knowledge of the Tower's buildings, its institutions and its historical *raison d'etre* is often exhibited by the present management and is a source of concern. Recently a number of healthy Virginia creepers that adorned the curtain wall between the Bloody Tower and Bell Tower were poisoned and removed. These plants were already mature in 1861 when Dages & Harman carried out the first detailed photographic survey of the Tower.[27] Combined with the delightful iron grills that protected their bases the plants were clearly part of a regular Georgian planting scheme and the only surviving fragment of historic garden planning at the Tower that should have been explained to the visiting public and not destroyed. When I approached the HRP officials responsible for this act of vandalism it was clear that they knew nothing about the history of the plants or even the existence of the earliest photographic study of the Tower! With that depth of knowledge the fabric of historic buildings are always going to be at risk.

In 2007 Historic Royal Palaces was advised by UNESCO that the World Heritage status of the Tower might be moved to the List of World Heritage in Danger after its World Heritage Committee expressed concerns that included the encroachment of modern developments. Had this happened HRP would have been bathed in a unique limelight. That said, it is worth recording that the only building of any significance that has been erected in the Tower since the rebuilding of the Main Guard in 1898, immediately north of the Wakefield Tower (whose gutted shell was removed after the end of the Second World War) is the large kitchen block that HRP erected on the site of the Irish Barracks in 2005. This large, and arguably uninspiring, edifice has obscured from view most of the curtain wall between the Salt and Broad Arrow towers, including the important, well-preserved, postern gate of *c.* 1240 that so clearly demonstrates the ground level of the fortress during the reign of Henry III.

Another one of the 'modern developments' was HRP's own ruthless treatment of Tower Hill. The view of the fortress from Tower Hill was, until its destruction in 2005, virtually the same as when the artist and photographer

Fig. 5: composite photograph showing part of the blocked crenellations of Edward I's surviving in the Outer West Curtain Wall immediately south of Legge's Mount. The view shows the rear of the upper parts of these remarkable features and includes the arch of an arrow loop in one of the merlons (the upstanding part of the crenellations) (© author)

Festival of British Archaeology 2011:
discovery, creativity, spectacle

According to organisers of some of the 40 events that took place in July, this year's Festival of British Archaeology was the most successful yet.

Just one event alone, the annual access to the Tower of London 'beach', organised by Historic Royal Palaces, City of London Archaeological Society, Thames Discovery Programme and others attracted over 600 to explore the foreshore, handle finds and get involved in archaeology.

Local societies from Bexley to Enfield devised activities for children and adults, whilst sites from an ice house in Camden to a bath house in Orpington opened for a rare viewing. The Museum of London's Roman-themed events, including the spectacular gladiatorial games at the Guildhall, were a huge hit. London Archaeologist's stand at the Museum was overrun with children from as far afield as Switzerland, Korea and

LEFT Maia shows off her sun mosaic.
ABOVE LA committee members Jane Esden and Josephine Brown help hoards of children create *marsupia* to hold their *defixiones*.

Argentina having a go at creating a mosaic masterpiece or devising cunning charms and magical wishes to put in their Roman pouches (*marsupia*). If baby brothers, world peace and enchanted pets turn up unexpectedly this year it will doubtless be down to the children's *defixiones*.

George Hilditch took the earliest snapshot of the Tower known to man and exhibited it at the Society of Arts exhibition in London of 1852 (Fig. 4). The almost 'prehistoric' credentials of the view are confirmed by the fact that the Beauchamp Tower shows no evidence of the 1852–3 'restoration' at the hands of the Office of Works and their appointed architect Anthony Salvin.

A careful examination of the original print strongly suggested that the outer curtain was topped with crenellations. After the faces of the curtain wall were cleaned the positions of the blocked crenellations were revealed and my composite photograph shows in publication for the first time part of these remarkable features that belong to the late 13th century and the reign of Edward I (Fig. 5).

In the foreground of the Hilditch photograph may be seen the iron railings that were erected in 1829 to replace wooden fences that had stood here for hundreds of years (where are the railings now?). Behind them are the embryonic gardens that were planted on the glacis – the outer slope of the Moat – at the same time. Together with a paved path and seating these leafy environments were created for the benefit of the public so that they could perambulate the edge of the moat and perhaps dwell on the great fortress and imagine what had gone on behind its walls during a prolonged history.[28] Sadly, this benevolent piece of planning, together with the attendant medieval road that made its way up Tower Hill, was all swept away in 2005. Deprived of its historic setting the whole of Tower Hill has been converted into a wind-swept plaza that acts as a lorry park for elephantine trucks and huge cranes that help service ice rinks, corporate events and pop concerts that now take place in the moat. On the Hill, where Hilditch took his seminal photograph, now stands a gaunt, grey, slab of a building that serves as a ticket office. As daylight wanes, and cockcrow waits, red lights appear and the tomb-like structure seems to offer a whiff of the Fuhrer's Bunker. I wonder whether George Hilditch would have bothered to photograph the Tower if it looked like it does today?

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19. Painter: WO 47/3, f. 38: Plasterer: WO 48/3, f. 39; Glazier: f. 40; Smith: f. 41.
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28. For an outlined of these developments see G. Parnell 'Getting into deep water?' *London Archaeol* **7** no 15 (1995) 387–390.