Life on board H.M.S. *Thunderer*

Annotated by Ian Sturton

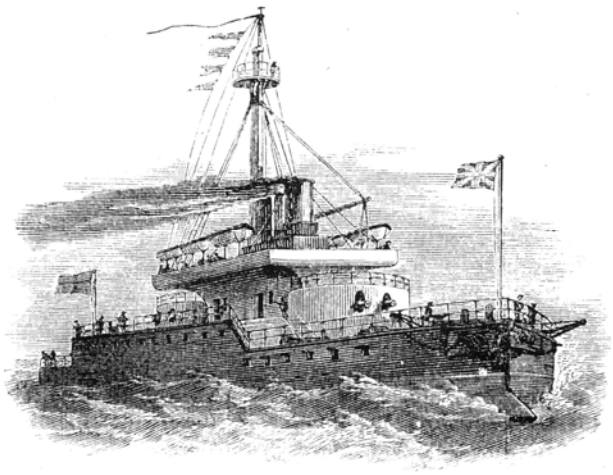


Figure 41. A contemporary woodcut of H.M.S. *Devastation* as built; H.M.S. *Thunderer* was very similar. Vertical proportions are distorted; under normal conditions the ram would be 10 ft under water.

H.M.S. *Thunderer*, the second ship of the *Devastation* type, was laid down in Pembroke Dockyard on 26th June 1869, and launched 25th March 1872. She was ordered to Portsmouth at the end of March 1873 for final fitting out, with a year's work to complete on her. However, because of intense debate in Parliament and the Press in 1872-73 as to whether ironclads of this type were 'proper' first class battleships, *Thunderer* was delayed until *Devastation* had been thoroughly tried at sea. Further delays were caused by the decision to modify her armament and by a boiler accident, as discussed below. She was eventually commissioned 26th May 1877 for the Reserve Fleet and based in Portsmouth. The *Devastation* and *Thunderer*, the Royal Navy's first sea-going 'mastless' turret ships, were viewed with suspicion after the sea-going turret ship *Captain* capsized and sank in a gale in September 1870. All three had low freeboard, but only the *Captain* had a full set of masts, yards and sails.

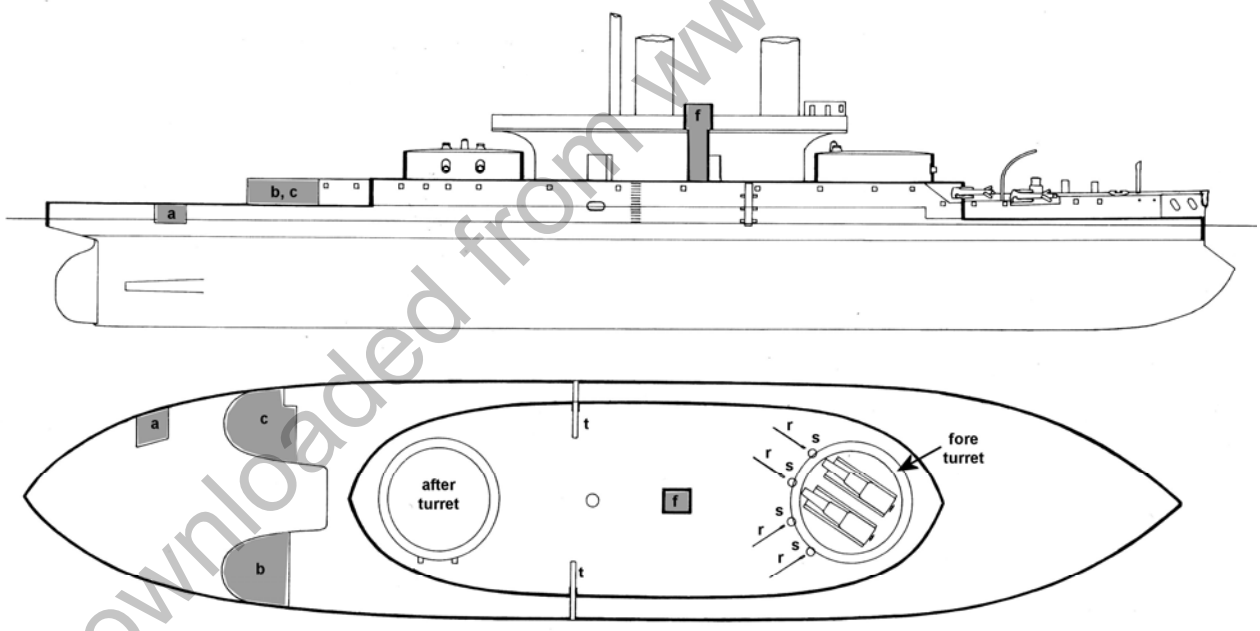


Figure 42. Elevation and schematic plan of Thunderer. In plan, the fore turret is trained for loading. The loading positions were 33º either side of the centre line behind the turret.
Key: a = captain's 'fighting cabin'**, b** = captain's main cabin, **c** = wardroom, **f** = 'fighting tower', **r** = ramrods, **s** = shell hoists, **t** = torpedo tubes. The **thick** lines show the extent of the armour belts.

In 1877 or 1878, R. M. Ballantyne (1825-1894), author of *'The Coral Island'* (1858) and many other adventure stories for boys, was invited for a ten day stay on board Her Majesty's ironclad turret-ship *Thunderer*, Captain J C Wilson. This account of his stay is condensed and edited from his book *'In the Track of the Troops: A Tale of Modern War'*, James Nisbet & Co., London [1]. Ballantyne is careful to stress the veracity of his account and my annotation confirms a high degree of accuracy.

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"During my stay I inhabited the captain's 'fighting cabin', so styled because it may be inhabited in safety while the ship is in action, being within the ship's tremendous armour plating. At other times the captain occupies a large handsome cabin on the deck, which, although made of iron capable of resisting winds and waves, is nevertheless liable to be swept bodily into the sea if hit by the giant shot of modern days. A corresponding cabin on the port side of the ship constitutes the wardroom, and might also be blown to atoms if a shell were to drop into it.

"A large proportion of what meets the eye above the waterline of this ironclad, and looks solid enough, is of this comparatively flimsy build; not meant to resist shot or shell; willing, as it were, to be blown away, if the enemy can manage it, though proof against rifle bullets [2]. There is a huge central erection, the 'flying' or 'hurricane' deck, from which enormous davits project with several boats pendent therefrom. Out of this flying structure rise the great iron mast – with a staircase inside leading to the 'top' – and the two smoke-funnels of the engines. In the heart of it rises 'the fighting tower', an armoured core, as it were, from which the captain and officers may survey the aspect of affairs while fighting, steer and, by means of electricity, etc., work the monster guns of the ship. If all the flimsy ironwork about the vessel were blown into the sea, the *Thunderer*, with her low armoured hull, her central fighting tower, her invulnerable turrets with their two 35 ton and two 38 ton guns, and all her other armament and men, would still be there, as able and ready for action as ever – although with her aspect mightily changed for the worse.

"Stretched above my head and diagonally across the bunk in the 'fighting cabin' was an object which caused me no little surprise and much speculation. In appearance it resembled a giant flute with finger-holes that no man of mortal mould could have covered. Not till next morning did I discover that this tube was part of a system of air-distributing pipes, supplied by fanners worked by steam, whereby fresh air is driven to every part of the vessel [3]. I felt soothed by the reckoning of about thirty inches of solid comfort – armour-plates, of from ten to twelve inches thick, affixed to a timber backing of eighteen inches in two layers – between me and 'death', and dropped asleep.

"The day following, a Sunday, was begun by a careful and minute inspection of the crew and ship. First the men were mustered by bugle on the upper deck, - marines on one side, blue-jackets on the other. The captain, followed by all his chief officers, walked slowly along the front ranks and down the rear, with critical eyes. I followed in their wake. After inspection, the men were dismissed, and the captain with his following descended to the interior of the ship. We went along the sides of the vessel, where the arms were ranged, and any speck of rust or appearance of careless treatment of the polished and glittering weapons was noted, and the responsible officer called then and there to account. So was it in every department. Every order given was emphatic yet considerate; it was evident that the captain, in cases where 'departments' were so well managed that no fault at all could be found, found a pleasure in 'giving honour to whom honour was due.'

"Having completed the inspection of the main deck, we descended to the lower deck, where the men lived and messed, and where a clean and trim blue-jacket – 'cook of the mess' for the day – stood at the head of each table. The tables and cans and tins and platters and men were required to be as clean and bright as a new pin. Then on we went to the berth of the warrant-officers, and after that down still lower to the engine-room. There the chief engineer came to the front and became responsible for the mighty cranks and gigantic cylinders and awe-inspiring beams, and complicated mazes of machinery [4]. Next we went to the lowest depths of all, among the boilers, which appeared to me like an avenue – a positive street – in Pandemonium. It was here that the tremendous explosion occurred in July 1876, when

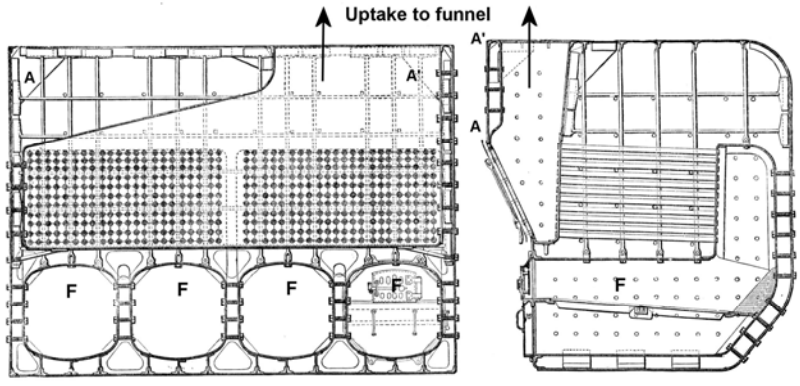


Figure 43. Layout of a typical Admiralty 'box boiler' of the period.
Key: F,F,F,F = furnaces, **A,A'** = top panel which failed in the *Thunderer* boiler.

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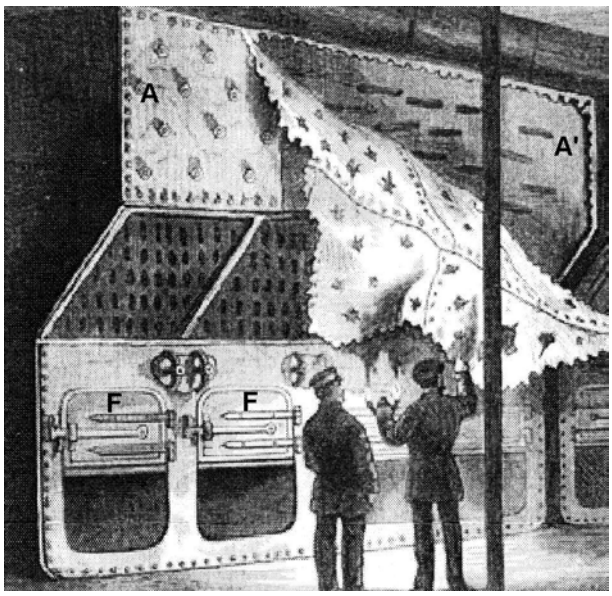


Figure 44. Contemporary woodcut showing damage to the boiler after the explosion.
Key: F,F = furnaces, **A,A'** = failed boiler panel

upwards of forty men were killed and many wounded, the captain himself (who was in the engine-room at the time) narrowly escaping suffocation [5]. Thereafter, the magazines of shot and shell were visited, and, in short, every hole and corner of the ship, and thus in an hour or so the great ironclad was pronounced to be in a healthy state of mind and body. We finally went to the fore part of the ship, where we found the crew assembled, and where, standing at the capstan, the captain read the Church of England service, the responses being effectively rendered by the stalwart crew.

"Next morning I had an opportunity of witnessing the big-gun turret drill. It was an imposing spectacle, a fine display of the power of mind over matter. Force, might, weight, appeared to have attained their culminating exemplification here, and yet the captain said to me that his 35 ton and 38 ton guns [6] are mere pistols to the things which are being prepared for vessels of our navy yet to come. The length of each 38 ton gun is nineteen feet (5.8 m), and its range about 6000 yards (5.6 km). Each gun costs between £2000 and £3000, and the expense of firing each shot is £12-10s (£12.50). The 80 ton guns which are to supersede these will, it is said, cost upwards of £10 000 each [7]. The cartridge which holds the gun powder (propellant) is a pillow, an absolute bolster, of some three feet (0.93 m) in length and twelve inches (305 mm) in diameter [8]; the shell which it is meant to propel weighs 614 lbs (280 kg) [9].

"The drill and working of these guns is magnificent. Nearly everything in the fore-turret is worked by steam and hydraulic power, so that comparatively few men are required to move the iron monsters. Some are inside the turret, and as guns and turret move in concert the men inside move with them. Others outside the turret stand at its base, below the iron deck and protected by the iron sides of the ship. The insiders revolve, aim and fire the gun; the outsiders load. The first lieutenant, standing at the base of the turret, close to the hole by which it is entered, so that he may be heard by both out and insiders, shouts, 'Close up'.

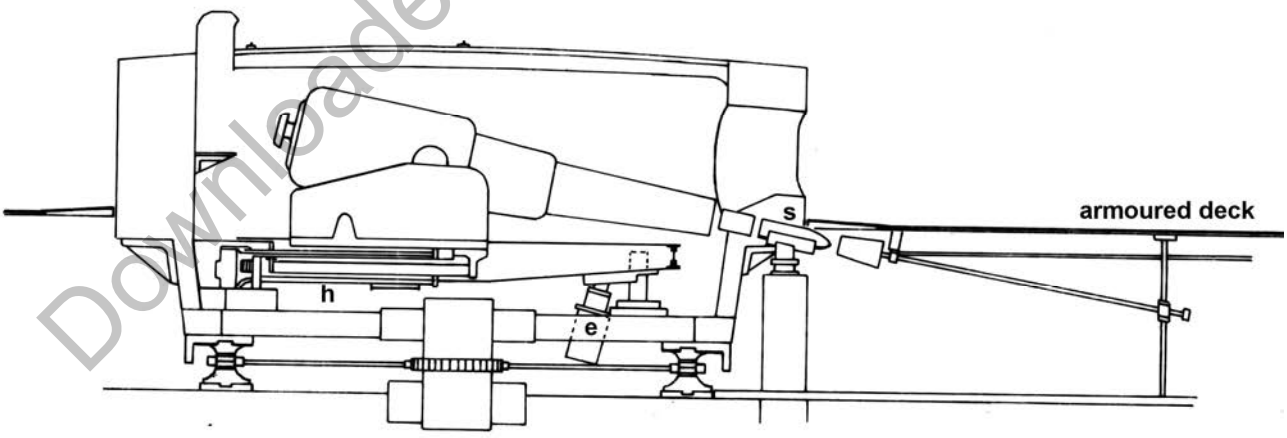


Figure 45. Simplified section of fore turret showing the external hydraulic loading system. The detailed arrangements for training the turret and running out and elevating the guns are not shown. For loading, the guns were depressed at an angle of 13° below the horizontal.
Key: e = hydraulic ram to elevate gun, **h** = hydraulic cylinder to absorb recoil of gun and also run it out, **s** = shell on hoist.

"At this, some men grasp levers, others stand by wheels which let on respectively hydraulic power and steam. The captain of the turret, seated in an elevated position, puts his head through a man–hole in the roof of the turret, which hole is covered with a bullet-proof iron hood, having a narrow opening in front. He

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surveys the supposed enemy, and his duty is to revolve the turret, take aim, and release the firing mechanism. The outsiders stand by the locking bolt, levers, shot-racks, etc. Then, in the attitude of ready-for-action, all become motionless attentive statues.

"The first lieutenant orders, 'Cast loose'. To my ignorant eye energetic confusion ensues. The captain of the turret is causing it to revolve this way and that, with its crew and guns, by a mere touch of his finger. Lever and wheel-men do their duty; the guns are run in (or out when required) with the ease of pop-guns, till certain marks on carriages and slides correspond; then they are laid, firing-gear is cleared and made ready, while the outsiders take out the tompion, open the port and scuttle of the gun about to be loaded, bring forward a bolster of powder (or a representative mass of wood), and place a giant shot on a 'trolly', which is just a little railway-carriage to convey the shot on rails from its rack to the gun. Meanwhile the captain of the turret gives the order, 'Starboard (or port) loading position,' turns the turret until the gun is opposite its 'loading-hole,' and then depresses its muzzle to the same point, jams it against the hole, and the turret is 'locked.'

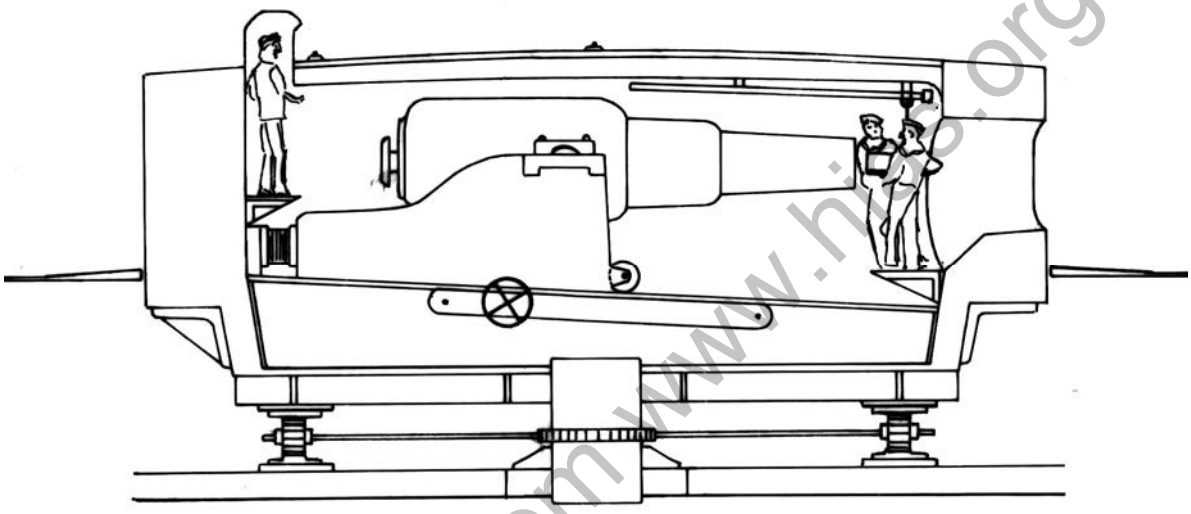


Figure 46. Simplified section of after turret showing internal hand loading system. The recoil is absorbed by friction slides and buffer; run out is by gravity.

"The order 'Sponge and load' is now given, but not by the first lieutenant. The forces at work are too great in some cases to be left to the uncertain human voice. A piece of mechanism, called a 'tell-tale,' communicates with infallible certainty that the monster is quite ready to feed! A hydraulic ramrod thereupon wets his whistle with a sponge, on the end of which is a small reservoir of water. The monster is temperate. This withdrawn, a wad is placed on the end of the ramrod. Three men shove a bolster of powder into the gun's mouth. The huge shot is then hydraulically lifted to the muzzle. No mortal man could move that shot a hair's-breadth in the right direction, but the hydraulic ram is brought to bear, and shoves the delicious *morceau* not *down* but *up* his throat with an ease that would be absurd if it were not tremendous[10]. The 'tell-tale' now intimates to the insiders, 'Gun loaded.' The captain of the turret gives the order, 'Run out.' Hydraulic power works again. In a few seconds the gun muzzle is raised, and projects through its port-hole. When the object and distance are named, the captain of the turret takes aim, and then follows, in more or less rapid succession, 'Elevate,' 'Depress,' 'Extreme elevation,' or the reverse, - 'Ready!' – 'Fire!' when the *Thunderer* is shaken to her centre, and twelve pounds ten shillings sterling go groaning uselessly into the deep, or crashing terrifically through the armour-plates of an unfortunate enemy. All this can be done by the captain of the *Thunderer* himself, by means of speaking tubes and electricity and a 'director' [11], so that he can, while standing in the fighting tower, aim, point and fire, as if with his own hand, guns which he cannot see, and which are forty feet or so distant from him. The ship also has a number of Gatling guns. This latter weapon is simply a bundle of gigantic muskets which load and fire themselves by the mere turning of a handle at the breech – a martial barrel-organ, in short, which sends a continuous shower of balls at a foe. Our largest Gatling can be hoisted to that platform on our mast, the 'top,' where, as one man turns the

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handle, another keeps supplying the self-acting cartridge box. As the handle is turned, the cartridges drop into their places and explode, raining bullets without intermission.

"Then there is the Whitehead torpedo [12]. This delicate instrument is elegantly formed of polished steel, shaped like a fish, and has a tail. Its motive power, which is a screw propeller, is in its tail. It has lungs, consisting of a tank for holding compressed air. It has a stomach, composed of a pair of pneumatic engines which drive it through the water. Its body is fourteen feet (4.3 m) long, more or less. Its head contains an explosive charge of 110 pounds (50 kg) of wet gun-cotton, with a dry disc of the same in its heart. One of the peculiarities of this celebrated torpedo is that it can be regulated to travel at a given depth below water. This is not so much to conceal its course, which is more or less revealed by the air bubbles of its atmospheric engine, as to cause it to hit the enemy ten or twelve feet (3 m) below her waterline. When the order is given, a torpedo is lifted onto a species of carriage in the compartment where it is stored and wheeled to the side of the ship. Here a powerful air pump is started, and the lungs are filled almost to the bursting point. The deadly head – brought from the magazine – is at the same time attached to its body. Another instant and a port is thrown open in the *Thunderer*'s side, through which the Whitehead is launched with a sluggish plunge into the sea. While it is in the act of passing out a trigger is touched which starts the pneumatic engines. The screw propeller twirls, and the monster, descending ten feet below the surface, speeds on its deadly mission."

Footnotes:

1. No date, but preface 1878. The book is available as a print-on-demand paperback. Another chapter describes experimental work at the Naval Torpedo School.
2. The shell plating was of 1in (25 mm) iron. In armouring terms, the ship was of the breastwork monitor type; the scheme is shown in Figure 42 where the thick lines show the disposition of the armour.
3. Artificial ventilation was essential in low freeboard ships with external hatches and doors that would have to remain closed at sea. According to the original drawings, the air-distributing pipe in the captain's 'war cabin' had a diameter of eight inches.
4. *Thunderer* had horizontal direct action engines by Humphrys, Tennant & Co. of London, this company's first battleship machinery contract.
5. The accident took place off Portsmouth on 14th July 1876; *Thunderer* had left harbour to start full power trials in Stokes Bay. The upper part of the front of the starboard forward boiler blew out, filling the machinery spaces with steam. Fifteen crew members died instantly, and thirty of the seventy severely injured died later. The enquiry determined that the stop valves had not been opened, the pressure gauge was out of order and had been shut off, and the safety valve failed, possibly through corrosion. Boiler working pressure was 30 p.s.i.g. (200 kPa); the pressure at which the boiler failed was not known. H.M.S. *Thunderer* was the last large naval ship to be fitted with 'box' boilers. Figure 43 shows the layout of a typical 'box' boiler of the period with its maze of stays to keep the flat sides in shape.
6. *Devastation* and *Thunderer* were each designed to carry four 12 in (305 mm) 35 ton muzzle-loading rifled (MLR) guns in two turrets. *Thunderer* was altered while under construction to carry two 12 in 38 ton guns in her fore turret, with, for the first time, full power operation. The turret was rotated by a steam engine, a large hydraulic cylinder was used to run the gun in and out and absorb the recoil, and further hydraulic mechanisms elevated the gun and operated the loading apparatus. The guns were shipped from Woolwich to Portsmouth in January 1875, and two of the four 35 ton guns already sent (but not installed) were returned. The 38 ton gun was three feet longer than the 35 ton gun, and, unlike the lighter weapon, too long to be reloaded in the turret. 38 ton guns bored out to a caliber of 12.5 in were fitted in later turret ships.
7. The 16 in (406 mm) 80 ton gun went to sea only in the citadel ship *Inflexible*, which carried four in two turrets. The largest muzzle-loading rifled guns ever put afloat were the 17.7 in (450 mm) 100 ton Armstrong guns in the Italian turret ships *Duilio* and *Dandolo*.
8. The 'bolster' weighed 112lb (50 kg).
9. This is Ballantyne's only significant error; the weight quoted is for the shell used in the older 12 in 25 ton gun. Shells for the 35 ton and 38 ton guns weighed 706lb (320 kg) and 809lb (370 kg) respectively.
10. After Ballantyne's visit, H.M.S. *Thunderer* was ordered to the Mediterranean in October 1878; the fleet was based for the winter in Artaki Bay, in the Sea of Marmora. On 2nd January 1879, while the

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ship was on gunnery practice near Ismit, there was a second disastrous accident. One of the 38 ton guns in the fore turret burst, killing eleven crew members and injuring thirty. Several theories were considered in the subsequent inquiry at Malta. The shell might have slipped down slightly and jammed in the rifling as the loading ramrod was withdrawn, leaving a space between it and the charge which remained as the gun was elevated. Alternatively, two charges might have been loaded before the shell. The third possibility was a complete double loading of charge-shell-charge-shell, and this explanation, although seemingly very unlikely, was considered the most probable. The supposed sequence of events is given by Seymour:

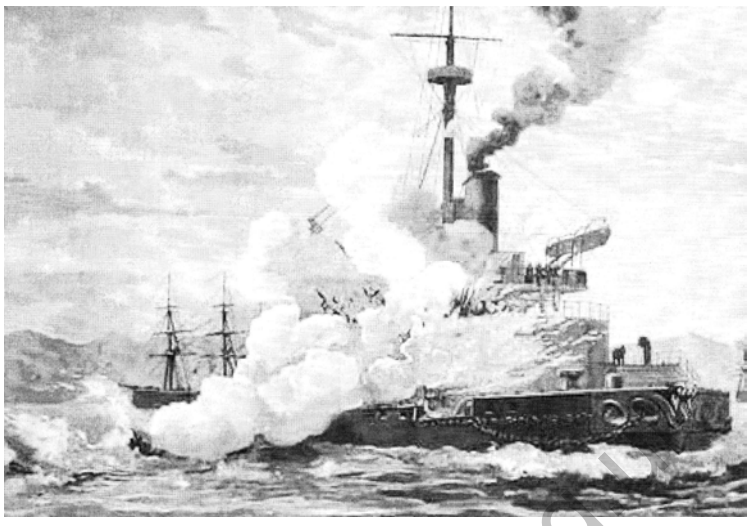


Figure 47. Contemporary picture of the explosion in the fore turret on 2nd January 1879.

"Both turret guns were being fired simultaneously, but evidently one did not go off… The men in the turret often stopped their ears, and perhaps closed their eyes, at the moment of firing, and then instantly worked the run-in levers, [without noticing] how much the guns had recoiled. This no doubt [happened]. Both guns were then at once reloaded, and the rammer's indicator, working by machinery, set fast and failed to show how far the new charge had gone. This, too, may seem unlikely, but no doubt it happened. The gun on being then fired, burst…"

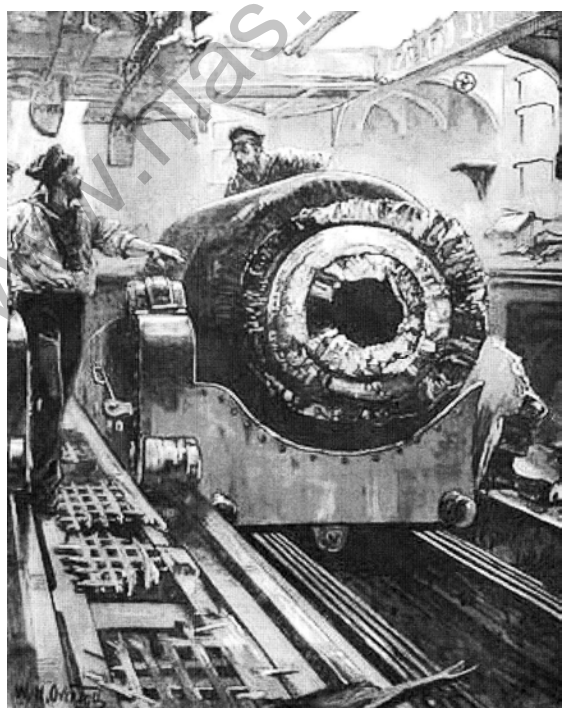


Figure 48. The fore turret and gun after the explosion.

Another 38 ton gun was subsequently double-loaded at Woolwich, and burst in the same way as the gun in *Thunderer*. This accident was important in the Navy's decision to adopt breech-loading rifled guns in place of muzzle loaders; breech-loaders could not be double-loaded.

11. Mr Elliott's telescopic 'directors' for sighting the guns were fitted in the pilot house (fighting tower).
12. The *Thunderer* was fitted with 16 in (406 mm) experimental torpedoes, replaced in 1881 with normal 14 in (356 mm) weapons. (Data from David Brown and Oscar Parkes)

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The Times, files 1873-1879.
'As fitted' drawings of HMS *Thunderer* held in the Brass Foundry outstation of the National Maritime Museum, and viewed by courtesy of Andrew Choong.

Crossing Borders - Fareham Chimney Pots

Alan H. J. Green

Hilaire Belloc did not much like Hampshire, denouncing it as being *the waste* that lay beyond the border of his beloved Sussex, but he was probably unaware of the fact (or if he was he chose to ignore it) that the rooflines of many towns and villages in the western half of Sussex, including two of the houses in which he lived in Slindon, are considerably enhanced by a particular product of its neighbouring county. That product is Fareham chimney pots.

As the name implies these pots were made in Fareham, and they are of a most distinctive and instantly recognisable pattern. Fareham was once home to brickworks and potteries drawing on the abundant local supplies of red clay for their products. Fareham bricks were used to build the Albert Hall and they were even exported to South Africa for the construction of colonial buildings in Cape Town.

Surprisingly, although Fareham chimney pots are so widespread in the South, there is little by way of published research about them, but Westbury Manor Museum in Fareham has a display about Fareham's potteries and brickworks and also some rather limited resource material. This material suggests that chimney pot manufacture in Fareham probably started around 1750, but no date is proffered for its demise. It is noticeable that outside their home town, few such pots are to be found on buildings dating from after 1850, but in Fareham itself two late Victorian terraces, in Wickham and Osborn Roads, do sport them in numbers, suggesting that at the end of the nineteenth century some were still being produced for the home market.



Figure 49. A retired Fareham chimney pot now residing in the author's garden. It exhibits the characteristic signs of being hand-thrown and suffering from distortion in the kiln.

Brickworks and potteries in Fareham

The various brickworks and potteries were situated to the north of the town on a wide band of clay which, whilst being a boon to the industry, caused havoc with the railway. Constant movement in the tunnels and clay cuttings on the line to Eastleigh caused a new line, known as the *Fareham Deviation*, to be built as part of the Meon Valley project. This line by-passed the tunnel to the west and rejoined the old line at Knowle. Unfortunately the deviation ended up suffering even more clay subsidence and heave, and had to be abandoned in the early 1970s, with all traffic returning to the direct line through the tunnel, which was actually less troublesome.

The main brickworks was at Funtley (also known as *Fontley*) just to the east of the direct railway line to Eastleigh, to which it was connected. However, from an early twentieth century catalogue, it appears that their output was restricted to bricks and tiles and did not include chimney pots, but it is quite possible that they had made them in the past [2].

The largest pottery was at North Hill. It had been founded by the Harris family but they sold it in 1873 to John Sandy who continued to run it as a family business [3]. In an undated, but characteristically Victorian, advertisement, John Sandy claimed to be "the largest manufacturer of flower pots in the South and South West of England" and states that the pottery was

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established in 1804 [4]. An 1862 billhead for North Hill lists chimney pots amongst its many products. One of the chimney pots in the Westbury Manor collection is stamped 'Fareham Potteries, J Sandy' which suggests that Sandy used alternative names for his establishment. Indeed, North Hill is marked as 'Fareham Pottery' on the 1875 Ordnance Survey map. In the twentieth century North Hill adopted more modern means of production, but when it closed in 1966 it still employed two traditional potters who were engaged on making ornamental flower pots. One of these potters told a newspaper reporter that the business was apparently 300 years old [5] - the verity of this statement is yet to be proven! There was another pottery on Fareham Common, near the erstwhile Maylings House, and a rhubarb forcer in the Westbury Manor collection, decorated in the same manner as a Fareham chimney pot, is stamped 'Fareham Common Potteries'. To the east of this there was another brickworks at Furzehall [6].

All the Fareham potteries and brickworks have long-since closed and the area they occupied has been built over with housing, but here and there road names, such as Kiln Road, Potters Avenue, Kiln Acre and The Potteries, serve as silent reminders of the industrial past.

The Fareham Chimney Pot

Fareham chimney pots are hand-thrown and the usual size, at 32 inches (810 mm) and known as a 'Long Fareham',[7] is much taller than what became the standard in Victorian times, and four inches (100 mm) short of what today is classed as a 'tallboy'. To raise a pot of this size called for particularly long arms, but the taller ones [8] were made in two sections that were amalgamated before firing. They did come in shorter sizes but these less common. The pots fire to a pleasing pinkish-orange colour of a rather Mediterranean hue, and they taper from the base on a convex curve which imparts an almost classical *entasis.* However the most distinctive feature of a Fareham chimney pot is the applied decoration. There is a frill of crimped pie-crust decoration pinched out of the wet clay just below the rim, but the icing on the cake (to continue the baking metaphor) is the application of white slip, firstly painted on the rim and then in up to three bands around the body of the pot; into these bands a wavy-line design is inscribed with a stick before firing.

The inscribed pattern is quite crude but as it was intended to be seen only from the ground this did not matter. The number and width of the white-slip bands varied and this, taken with the fact that the shapes of the pots varied slightly from having been hand-thrown, and subject to minor distortion during the firing process, meant that no two were exactly the same. To add to this variety, some pots, instead of horizontal bands, had the white-slip decoration applied in the form of classical swags.

In Hampshire, as well as in their native town, places where Fareham chimney pots are to be seen include Portsmouth, Portchester, Romsey, Winchester, Alresford, Mottisfont, Gosport, Titchfield, Havant and Emsworth. Over the border in Sussex the greatest number of Fareham pots is to be found in Chichester [9] which is hardly surprising in view of the fact that it has such a high number of pre-1850 buildings and is only 18 miles from Fareham; indeed they are such a feature of the city that they are often – erroneously – referred to as 'Chichester pots'. Elsewhere in Sussex, I have found them in Selsey, Bognor, Arundel, Lavant, Singleton, East Dean, Midhurst, Petworth, Barnham, Yapton, Slindon, Littlehampton, Worthing, Shoreham and Brighton. A walk around Lewes, which has a high number of pre-1850s buildings, revealed no Fareham pots so it would seem that Brighton, 49 miles distant from Fareham, was the farthest east that they travelled, but I stand to be corrected on this. West of Hampshire they are to be found in Wiltshire, particularly in Salisbury which is 39 miles overland from Fareham, whilst 80 miles west along the coast in Dorset they are much in evidence on Georgian buildings in Weymouth. They were also exported to Guernsey where they were used all over the island, and no fewer than 58 are to be seen in St Peter Port itself [10]. Another "overseas" destination for



Figure 50. A lone Fareham chimney pot on 3 Vicar's close, Chichester. Instead of horizontal bands the decoration consists of classical swags. It has a cowl which is also decorated with white slip.

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Figure 51. A fine regiment of Fareham pots on 30 North Street, Chichester. They are all different, and the one third from the left has its decoration in the form of classical swags. The second pot from the left is a modern machine-made replacement that provides a sharp contrast to the hand-made originals.

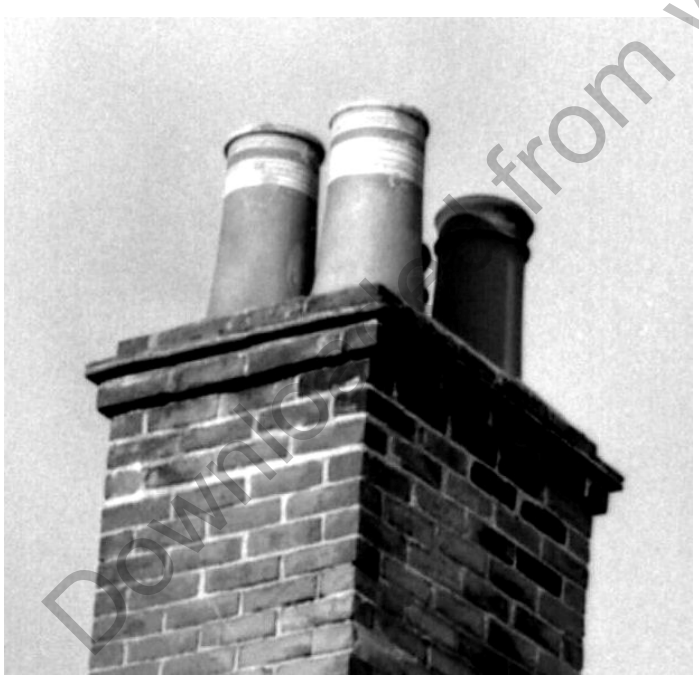


Figure 52. A pair of chimney pots on 13 East Pallant, Chichester. With their concave sides and decoration consisting of groups of narrow parallel bands instead of wavy lines, these might not be genuine 'Farehams' but imitations.

Fareham chimney pots was the Isle of Wight, where they can be found in Ryde and Shanklin

Although the Fareham pots were so decorative their use does not seem to have been dictated by status as they are to be found on stately mansions and humble cottages alike. The question has to be asked as to why, in the pre-railway age, Fareham cornered so wide a market in chimney pots; a market that extended far beyond the Hampshire borders and even overseas. This is particularly curious with respect to Sussex where, with its abundant supplies of clay and many brickworks, quality chimney pots should have been produced economically and much nearer to hand. One edge Fareham may have had over its competitors was its Stamshaw clay, which was particularly plastic and thus conducive to raising large hand-thrown items [11], including large rhubarb forcing pots. Possibly this property also reduced the risk of expensive losses in the kiln. In addition Fareham was then a port so its products could be transported easily by sea.

The rapid spread of the railway system through the country after 1850 inevitably made the importing of machine-made chimney pots from industrialised areas of the country more economical than sourcing a hand-made local alternative. As such, local manufactories suffered and the export of Fareham chimney pots to neighbouring counties probably ceased about this time.

When is a 'Fareham' not a Fareham?

When the Harris family sold North Hill to John Sandy in 1873 they dispersed; some to Dorset and some to Wrecclesham near Farnham in Surrey where, apparently, they continued to make similar products to before [12]. Indeed Fareham-style pots are to be seen in Farnham and it is possible that those in Weymouth were actually made in Dorset by an *ex-pat* Harris rather than at Fareham itself. Also it is inevitable that other potteries would want imitate the 'Fareham' style that had proved so popular, and over in Sussex, in Chichester and Midhurst, are to be seen a few pots which do not seem 'quite right', being shorter, of a slightly darker hue, with concave curves to their sides and white slip decoration consisting of groups of closely-packed, narrow parallel bands. Could these be the product of a rival pottery? Interestingly I found no examples of this variant in my walks around Fareham.

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In the erstwhile Arundel Museum in Sussex was a display consisting of two very different chimney pots labelled as having originated from the nearby Poling Pottery. One of these was a short, rather nondescript, pot but the other appeared in every respect to be a thoroughbred 'Fareham'. Mollie Beswick, in her excellent *Brickmaking in Sussex,*[13] states that the Poling brickworks began making pottery from the 1880s with flowerpots being a speciality, and she includes a 1930s photograph of the works in which chimney pots can be seen sitting on a wall in the distance. It is impossible to tell from this photograph whether they are in the Fareham style and, so far, I have been unable to find any firm evidence that they did make them in this form; indeed it is strange that Valentine Fletcher's seminal work *Chimney Pots and Stacks*, published in Arundel in 1968 [14], although including Fareham pots, makes no mention of Poling. Before Poling Pottery closed in 1957 some workers had moved to Fareham, but by then chimney pot manufacture had ceased, except for the occasional special order [15].

Some Fareham pots are helpfully stamped with the name of the pottery but this practice was not widespread, making positive attribution tricky. A further identity problem may of course lie in the possibility that not all genuine Fareham pots carried the white-slip decoration – there are several pots to be seen of the right proportions and colour but lacking the 'icing'.

Envoi

As we have seen, from the middle of the nineteenth century, the migration from Fareham of these delightful chimney pots ceased, and chimneys were then topped with those soulless, mass-produced, buff-coloured efforts imported from London and the midlands, that are to be seen everywhere and belong nowhere. However, Fareham pots have been revived. When Uppark, high on the Downs above Petersfield, was destroyed by fire on that fateful afternoon in August 1989, its ranks of Fareham pots perished as the chimneys collapsed. The National Trust took the decision to rebuild, but by using only traditional materials and craftsmanship, so 43 new 'Fareham' pots were commissioned from the West Meon Pottery and, in the process, an old custom of inscribing the same with historical anecdotes was revived. One pot bears the momentous inscription '*Margaret Thatcher resigned as I was making this pot'* [16]. West Meon Pottery will make Fareham pots – with or without inscriptions - to special order.



Figure 53. A pair of Fareham chimney pots on 21 South Street, Chichester. Both have wavy-line patterns in their decoration but one has two bands and the other only one. Could one be a corporal and the other a mere lance-corporal?

Chimney pots constitute one of the most vulnerable elements of a building's fabric, being prone to toppling during severe storms and at risk of being replaced with an alternative design in attempts to cure down-draught problems. As such, the number of Fareham pots that have survived in situ, whilst remarkable, is undoubtedly much smaller than the number originally installed. My listing of the instances of Fareham chimneypots can really only be considered as perfunctory, consisting as it does of observations made in my general travels, so I would very much welcome news of sightings in other places, either via the Editor or by email (agreenzone@aol.com). I would particularly welcome any positive information relating to the manufacture of Fareham-style pots elsewhere in the South.

The fascinating subject of brick, tile and pottery manufacture in Fareham is worthy of a large-scale and detailed study from primary sources, and it is to be hoped that someone might be inspired to undertake the research. Meanwhile I trust that your walks around towns and villages in the south will never be quite the same as you gaze heavenwards hoping to catch a glimpse of these beautiful examples of the potter's art.

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[Alan Green is a member of Sussex Industrial Archaeology Society (SIAS) and the first version of this article appeared in SIAS Newsletter No 141 in January 2009, entitled *A Cross-Border Affair – Fareham Chimney Pots.* He has produced this extended version for the HIAS Journal, in which he has included material on the Fareham potteries and given the text something of a Hampshire orientation.]

Acknowledgements

The author would like to thank the staff of Westbury Manor Museum in Fareham for their assistance in granting access to the material on Fareham's brickworks and potteries.

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Waste across Time: impacts on the environment

Roger Hedge

Most of us are now familiar with the travails of recycling, landfill and incineration. This is nothing new. Starting with the earliest elements of archaeology 'proper', I plan to outline how a kernel of 'an industrial archaeology of waste' existed, even from the Neolithic, at the very least. Most of this early waste was not a nuisance, nor an environmental burden, but does give us the first signs of man's presence and impact.

My first appreciation of the existence of past waste was on an extramural flint knapping course run by the Department of Adult Education, Southampton University, embracing a working visit to Down End Quarry near Fareham. The site was chosen deliberately as one with no known archaeological deposits, to avoid contamination by our studies [1]. The debitage and waste left behind by knappers is a common feature of tool production during the Stone Age. It is probably the oldest waste available and is arguably an industrial waste, even though most commonly dealt with by mainstream archaeology. A wider appreciation of sites showing Stone Age remains in Hampshire can be got for the Palaeolithic, the Mesolithic and the Neolithic [2].

Archaeologists coyly refer to periods called pre-pottery A and pre-pottery B. So it is fitting, perhaps, to consider what followed next, i.e. pottery waste. For anyone not happy with the idea of flint debitage marking the beginnings of waste, as a topic within Industrial Archaeology, then one can hardly deny that pottery brings together a range of materials, including glazes, once introduced, sources of energy and process equipment. The Age of IA has begun.

I moved on to excavating Roman pottery kiln sites around Fritham, in the New Forest, with the Hampshire Field Club and Archaeology Society. This waste is the broken discards of failed and misfired pots, unused clay and general residues. These are not the myriad pots and shards dug up from occupation dwelling sites in the widest sense, but may embrace broken pots in middens and back-fill, which were surely discarded. This habit bears a similarity to the time before a universal rural waste collection service, when householders commonly dumped their household waste in middens that were emptied only occasionally by the local councils, with attendant fly and rodent problems. Alternatively, or as well, they formed mounds along their furthest boundaries, as found by me at Milford on Sea, and by a friend, at Downton. This practice by individuals foreshadowed above ground 'landfill', such as the assortment of sites along the eastward limb of the M27, with those at the junction with roads into Portsmouth being the most prominent.

Another very early commonplace waste is shell-fish remains, especially oyster shells. Man spread along the shores and upstream in the UK after the last Ice Age, finding sea food very easy to come by. However, he had little use for the shells except as decoration. Some may have served as oil light holders. Such shells are as much a waste as the discarded fish guts in fishing ports and kipper factories.

Such shells and pottery were found at the Brooks site in Winchester, though, despite reference to it as the large industrial area, Allen [3] does not mention industrial waste, nor do other Winchester City publications [4], though oyster shells are referred to in the 1987 booklet. He does refer to the latrine attached to the de Tytyng merchant house. This waste pit provided a wealth of information on food types and intestinal disease. Intriguingly, jewelry and pottery found their way into this pit, suggesting it was open. From an IA angle, at what point does the treatment of human excrement become an industry? Do septic tanks, as later adopted, count?

One wonders if Emsworth was one of the sources for the oysters found in Winchester at this time, as well as later [5]. Nor should one overlook Southampton as a source, with its well-founded Fish Market [6]. However, the earlier Saxon site of Hamwic, in the Six Dials / St Mary's area of Southampton, also had its fair share of such residues.

Many readers will be familiar with the archaeological record showing piles of oyster shells, accumulated over probably millennia, especially in the context of the above Saxon "city" predating modern Southampton. However, the following 'curiosity' [7] provides an example of such practices, as recorded concerning Australian Aborigines, persisting into very recent times.

> *In those days, all along the southern sand dunes ran the kitchen middens of the blacks* [this was the late 1800s] *, piles of empty shells of all kinds and, if anyone had taken an interest, probably containing tools or weapons of the lost race* [the aborigines of South and South East Australia were particularly harshly treated by the colonists]. *They are long since covered with drifted sand .... and these last relics of a vanished race have disappeared forever.*

It is difficult to be fully systematic over time but I now turn back to early stone quarrying. Egyptian quarries for their spectacular monuments and cities in the Nile Valley are not often close to the point of use. Like many similar activities anywhere, they leave great gashes in the landscape and no end of damaged and unusable piles of stone around and about. The nearest equivalent for us, perhaps, is Salisbury Cathedral with its quarry at Timsbury.

In Hampshire, we do not have large spoil heaps as in coal and slate mining areas. However, HIAS and SUIAG had many enjoyable tours to Wales under the leadership of Edwin Course. The Welsh slate industry provided much of the roofing for Hampshire homes, without the local eyesore of waste tips [out of site, out of mined!] [8]. The same could be said for coal from many areas of the UK.

Stone walls surrounded Southampton. Much of the stone came from the Purbeck hills and even as afar afield as Caen, in Normandy [9]. These will have their own quarry spoil but, more locally, there is evidence of construction, reconstruction and re-use that must have led to heaps of stone being littered around. The earlier Roman site at Bitterne shows evidence of Bembridge Stone, as well as Purbeck stone. The Roman control of the Isle of Wight is well-known. Brevity requires no further dealings with Southampton stone origins.It is natural to turn next to another building material, brick. Hampshire has an abundance of clays of varying

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quality relevant to brick making, so brick making was widespread and local, from the early times. Even small villages such as Milford on Sea, where I live, once had a tiny brickworks. The Beaulieu brickworks is well-known to HIAS members, as is the area on Hayling Island where hand-making of bricks was long-established. Bursledon Brickworks remains to remind us of the industry. The despoliation caused by clay extraction around Eastleigh has been partially remedied by making an environmental site there. One wonders if there is a line of clay slurry waste, traced across the land below the line of the overhead cable transport system. It is believed a number of Roman tileries [a usage preferred by archaeologists because of the size and shape of Roman "bricks"] existed around Hampshire but the only recorded details are given by Graham Soffe and colleagues [10].

I now go back in time to outline the emergence of metals, mining and use of their ores, and where the environmental impacts of their wastes may be found. During the pottery stage of the Neolithic, glazing techniques emerged. Whilst the first spur to the use of copper probably came from finding nodules of the metal, it has been argued [11] that observations during the firing of powdered metal oxides as glazes, provided the route to larger scale metal use, including the adventitious discovery of bronze. This was based on two principal lines of reasoning, firstly, the thermodynamics and kinetics of the reactions and, secondly, the fact that pottery kilns were the only high temperature industry known at the time.

Whatever the truth of this, it is well-documented that metal technology spread, alongside sedentary farming life styles, from the Near and Middle East, across Turkey and up the Danube basin, ultimately reaching Central Europe. There is a hillside, by the Danube, where the tailings from mining malachite, the principal copper ore, from antiquity, have blighted the soil and stunted plant growth to this day.

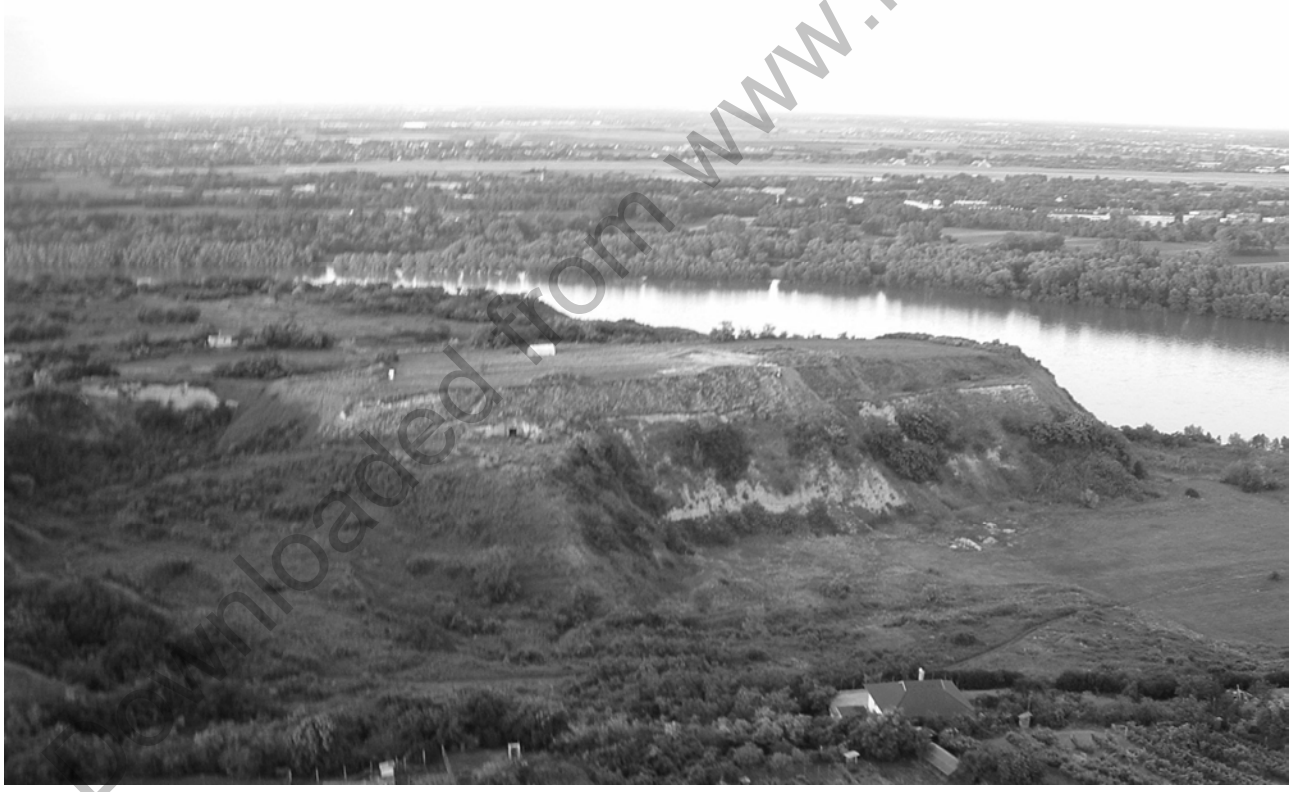


Figure 54. The remnants of metal mining on the banks of the Danube in Hungary.

The nearest illustration I have of this is of a Bronze Age site close to Budapest, at the Matrica Museum. The scene is one of stunted plant development and an 'untidy' landscape, where metal working and occupation went on side by side over millennia. It is a tell site, i.e. built up upon the accumulated debris of occupation. Don't bury it, flatten it and build on top. A process that continues to this day! The nearest UK equivalent may be Dartmoor, where shallow mining up to the Mediaeval Period has left humps and hollows not too dissimilar to the above.

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Finally, I come to the disposal of our mortal remains. Whilst we show reverence to such material, which is treasured and wanted, it has many of the features of 'waste' in that much space is occupied and much time and effort is consumed. It leaves a legacy of solid detritus often lost over time. I do not include the monuments as waste but more as markers of a site, even though they stretch over time to include Egyptian pyramids, continental catacombs and ossuaries, dolmens, cists, barrows and tumuli, around the UK. In more 'modern' times we get crypts and mausoleums. One thing such monuments imply is the material presence of bodies across the millennia. The monuments, as well as the graves of the general population, by the type of legacy left, show the changes in the processes used, i.e. inhumation, incineration (cremation) or more rarely, excarnation and ultimately exhumation. The type of 'waste' left differs, depending on the prevalence of the selected method of disposal.

In the slant of this paper, all of these are industrial buildings. Many of these burials yield 'grave goods' without which our knowledge of past cultures would be poorer. In such a way will our landfill enrich future archaeological understanding! Whilst there is no way of judging the importance of belief systems, as opposed to pragmatic needs, at all times in history, clearly incineration demands less disposal space than burial, for the 'masses'. Indeed, the Victorians were driven to set up satellite cemeteries around London, especially, and to set up rail systems to transport bodies and the attendant coffins from London to such places as the Brookwood Necropolis. The Brookwood Necropolis Company is surely the epitome of private capital applied to a public need; it built its private Necropolis Station on the south side of Waterloo to run special trains to Brookwood. The station was effectively destroyed during the Blitz in 1940.

Whilst cemeteries consume a lot of land this is not always a disadvantage. Many that are full act as wildlife reservoirs. Indeed, in SE London, Camberwell Cemetery was recognised as a Nature Reserve as early as the 1980s.

This seems a fitting note on which to end this short essay, with reclamation being the watchword of the age.

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Winchester City Mill. Ian Clark replacing the wooden teeth in the great spur wheel.
The replacement teeth are cut from hornbeam.
The stone-nut is in the foreground.



Fareham Chimney Pots. A detail from the author's Fareham chimney pot.
It has a white rim, a frill of crimped decoration and one band of white slip
into which a wave pattern has been inscribed whilst it was still wet.

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