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The Historic Landscape of Waltham Abbey Royal Gunpowder Mills

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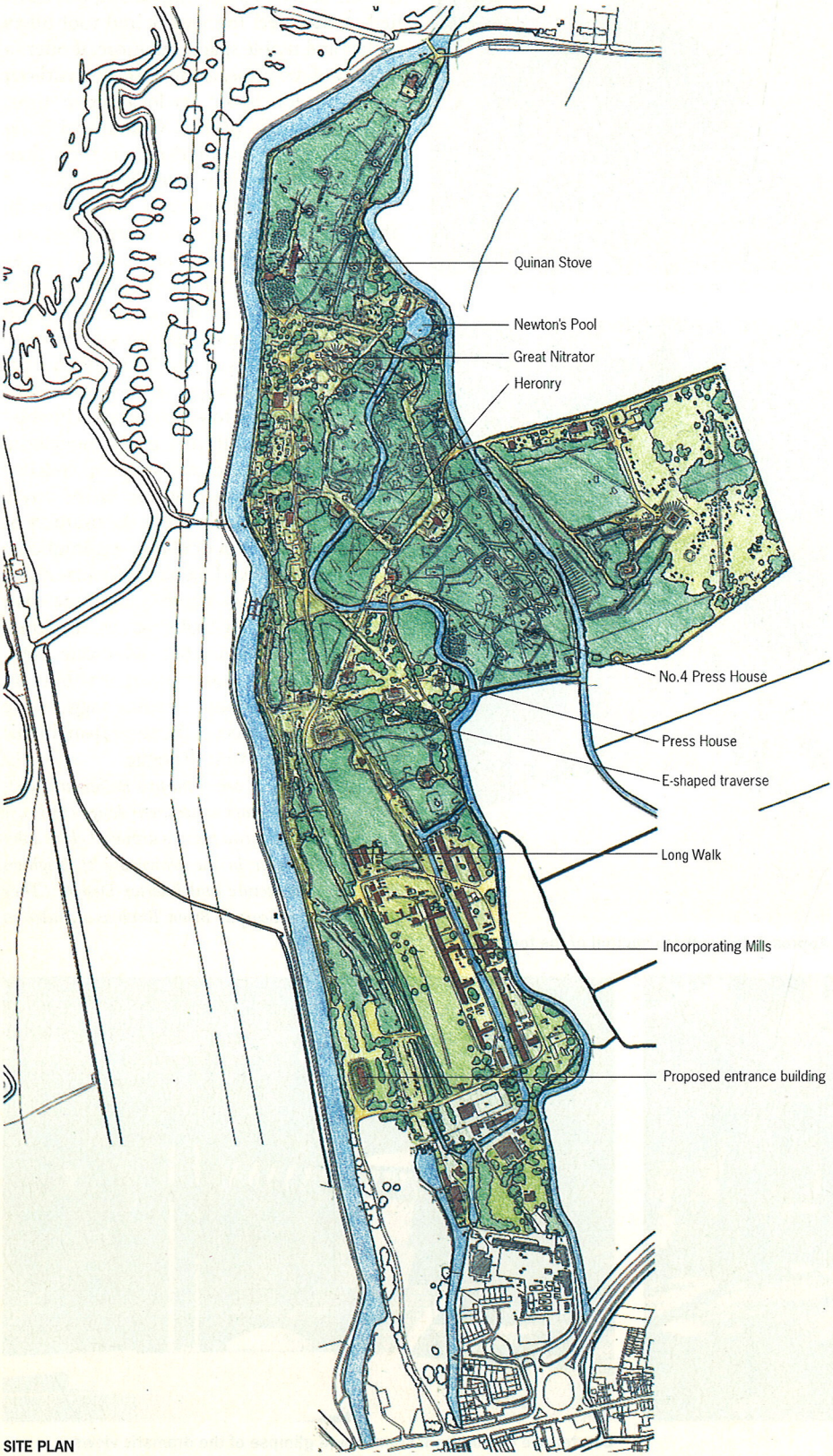
Secret world on the edge of London

The historic landscape of Waltham Abbey Royal Gunpowder Mills will soon be made accessible to the public

BY ANDREW MEAD. PHOTOGRAPHS BY MARTIN JONES



SITE PLAN

Waltham Abbey is a small town on the north-east fringes of London, too close for comfort to the busy A121. The abbey itself, much mutilated though with a sturdy Norman nave, is the only obvious lure for visitors, but that is set to change. Last October the Heritage Lottery Fund announced a £6.5 million grant towards a project for the nearby Waltham Abbey Royal Gunpowder Mills (WARGM). This former MoD site, decommissioned in 1991, presents an extraordinary fusion of landscape, architecture and industrial archaeology. The key challenge for its new owners, a charitable trust, is to foster public access – the estimated 80,000 visitors a year that financial viability demands – but keep its current character essentially intact.

That character is very complex. To begin with, more than two-thirds of the 71ha site is designated as a Scheduled Ancient Monument, with some 300 surviving structures and 21 listed buildings. Gunpowder was first produced there in the 1660s, and state ownership dates back to 1787. 'Its importance as a monument is that every significant advance in making gunpowder and later chemical propellants can be shown through its remains,' says Wayne Cocroft, the RCHME archaeologist who led research into the site after it was decommissioned. But the interest is not just architectural and archaeological: English Nature has designated 34ha as a SSSI. With public access long prohibited, rich and varied habitats have prospered. Groves of alder trees, once grown for the charcoal essential to gunpowder production, now

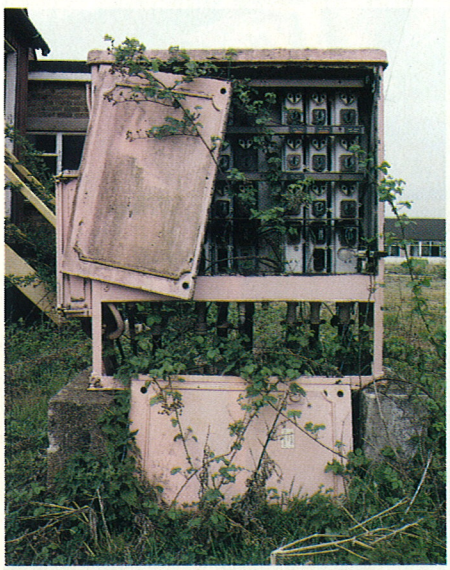
shelter the largest heronry in Essex. Siskin, woodcock and woodpeckers thrive there. Otters swim in the waterways.

Between the decomissioning of WARGM and last autumn's lottery announcement, there were extensive discussions among those with a potential interest in its future. Participants included English Heritage, English Nature, Essex County Council and Lea Valley Regional Park Authority – and, of course, the Ministry of Defence. The key player in taking these discussions forward at both a local and national level was development planners CIVIX, with its director Dan Bone (*see People, page 18*). Meanwhile the MoD spent some £16 million on decontamination.

'When we first visited the site we had no idea what we were going to find,' says Bone. 'We literally had to take machetes and hack our way through the undergrowth.' For the RCHME team, engaged on the most intensive recording project that the commission has yet carried out on an industrial or military monument, came the realisation that WARGM was of international significance – not just for particular buildings but as an entity, 'a historic landscape'.

This landscape was once marshland around the River Lea: what we see now has evolved over three centuries or more, with the channelling of watercourses and the introduction of species – especially alder – that the gunpowder industry required. The site expanded along the river valley from south to north. It has a strong linear character because of a dependency on water-power, and also the need to space out buildings for safety reasons.

The story starts with a former fulling mill which was converted for gunpowder production by 1665. In private ownership the works were described as the largest in the UK; state purchase, shortly followed by the Napoleonic Wars, brought increased activity. In the second half of the nineteenth century came a succession of technological developments: the introduction of steam-power and then (from the late 1880s) a change from producing gunpowder to a more potent, chemically-based explosive – cordite. In the First World War as many as 5000 workers were employed at the site. Inter-war research brought new discoveries, especially the wonderfully-named RDX (Research Department Composition X), half as powerful again as TNT and used in the Dambuster raids. Explosives manufacture ceased at WARGM in 1943 but in the post-war period it gained new life as the sole government laboratory to develop non-nuclear explosives, before closure in 1991. One major consequence of repeated technological change at the site is that buildings have frequently been adapted to new uses. 'Some structures have had up to six changes of function in a matter of decades,' says Cocroft.



Top: the Grade I-listed Incorporating Mills, 1861. Above: vegetation invades a switchboard

Asked to single out from the 21 listed buildings, and many other surviving structures, ones of particular interest or importance, Cocroft points first to the Grade I-listed Incorporating Mills (1861) – 'in architectural terms the grandest gunpowder mills in Britain'. Gunpowder was made of saltpetre, sulphur and charcoal: this was where those constituents were ground and combined. The building, of yellow brick laid in English bond, is T-shaped in plan, with a central engine house and adjoining boiler house roofed in slate. Incorporation was carried out in big iron mixing-pans in the wings to north and south, originally with insubstantial canvas/timber roofs, and each divided into three bays by brick partition walls to minimise effects of an explosion. It set the model for later incorporating mills at WARGM (mostly Grade II*); together they form a long canalside line by Queen's Mead, a wide-open space at the south of the site. All

Top and above: the Grand Nitrator – hub of the nitroglycerine factory

were subsequently converted for making cordite.

Cocroft mentions two other Grade II* buildings in the vicinity – an engine house/mechanics' shop and a boiler house, again in yellow brick and with hipped slate roofs. Both date from 1857 and relate to one of the most important developments at WARGM. They drove the very first steam-powered mills – demolished now, and different in plan (six interlocking trapezoidal bays) to their surviving successors. An explosion here made a cautionary engraving in an 1861 issue of the *Illustrated London News*.

Some of the most intriguing remains are towards the northern end of the site, where a nitroglycerine factory was established in the late nineteenth century. The Grand Nitrator, the factory's hub, is particularly striking – and sinister. This large circular mound, 42m in diameter and 6m in height, is of earth, partly revetted in concrete at its base. At its centre, reached by a curving passageway, is a brick-lined chamber. Here, in tanks supported on a free-standing timber structure, was where the nitration process took place. Sunk into the floor is an oval pit – a 'drowning tank' into which nitroglycerine would be discharged if the nitrator threatened to overheat.

The extreme sensitivity of nitroglycerine ruled out any manhandling, so the work in this area depended on liquids flowing by gravity between the various structures. Close by the Grand Nitrator, linked to it by lead-lined gutters in brick tunnels, are two more earthwork mounds, where acids which collected during nitration were washed out of the nitroglycerine; and then it could flow on into still another earthwork mound, the mixing house, for the next stage of production.

Also at this northern end is a building unique to WARGM: the Quinan Stove (1936). It is a long, steel-framed structure divided internally into a series of small bays where guncotton was dried. The frame is infilled with cement-covered wire mesh, the idea being that in the event of an explosion it would disintegrate rather than form dangerous flying fragments. While it marked an advance on earlier, circular stoves on the site (being both faster and safer), it was, says Cocroft, 'a technological dead-end'. Drying guncotton would shortly be superseded by new treatments discovered elsewhere.

These buildings mentioned by Cocroft, and many others, have considerable intrinsic interest – but it is their landscape setting that really makes them memorable. As you walk northwards through the site, its character gradually changes from being relatively open to enclosed, wooded and mysterious. The obvious route to follow is the Long Walk, an avenue running beside and then beyond Queen's Mead. Straight for several hundred

Above and above right: the Quinan Stove, 1936. Below: E-shaped concrete traverse beyond the Long Walk bend

metres, it eventually curves to the north-east. Suddenly the sense of enclosure is strong. You feel that you are trespassing in a private domain, a sensation doubtless more intense because of the secrecy that so long surrounded all activity here.

In front of you as you round this bend is a formidable E-shaped structure of moss-covered concrete: a blast wall, or *traverse*, which surrounded two buildings now reduced to their brick foundations. Considerations of safety informed the WARGM site at every level, large or small: flimsy roofs to minimise damage from flying debris, for instance, and bronze nails, locks and hinges to prevent any accidental sparks. But these traverses are among the most distinctive features of the site. This E-shaped one, dating from the 1880s, is of solid concrete, a type soon discontinued as it would shatter into dangerous chunks with an explosion. The later preference was for earthwork traverses, as at the nitroglycerine factory, while earlier examples are of brick, or earth and brick. With battered walls and stark profiles, their form reminiscent of Egyptian pylons, they punctuate any visit to the site. One has a clock attached at its apex, the hands frozen at five-past-eight, as ominous as a painting by De Chirico.

Past the Long Walk bend it becomes clear how extensive and ramified is the system of canals and connecting waterways at WARGM. Some of these waterways are viscous and motionless, others silted-up. A charred but still-recognisable barge is trapped in one dry bed. There are skeletal bridges, rickety and corroded, and cast-iron aqueducts (of types not recorded before by the RCHME). Buildings that front these canals often advertise their ruin: brick revetment to an old steam stove has shattered to reveal the hollow concrete core beneath; fissures in a concrete embankment, presumably caused by subsidence, indicate the poor subsoil (gravel of the River Lea) on which these structures stand. Breeze-block additions to a battered brick wall remind you of the continual changes that WARGM structures underwent.

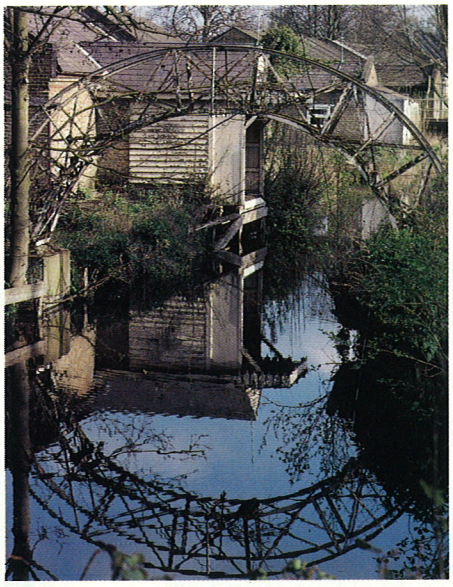
Occasional embellishments catch the eye – the red-brick cornice and dressings to the No 4 Press House, or the incised plaque that records this building's function and its date (1879). Later constructions, inter- or post-war, may be more nondescript: anonymous, utilitarian brick boxes, paint peeling on their gaping doors, and the remnants of former services – pipes, cables, telegraph and electrical systems – their only decoration. Once functional elements are perceived anew. Tiered metal racks forming an almost-perfect circle in an old guncotton stove look like an enigmatic sculpture; rough cubes of concrete scattered on the floor of the demolished acid factory seem, in low sunlight, as premeditated in their placement as any artist's installation.

In these northern reaches especially, the site has a powerful hold on the imagination. At times the impression is of stumbling into the landscape of an early Auden poem – a world of derelict industry, narrow-gauge railways, choked pathways and malign woods. At others, especially as foliage grows denser with the onset of summer, the associations may be more exotic: you remember stories of ruined cities discovered in Central American jungles. Moreover, the mounded forms recall long barrows and other funerary archetypes; scientific activity at WARGM was, after all, as

strange to most of us as the rites of any vanished cult. It is easy to fall into reverie here – but then the sound of a heron flying overhead returns you to reality.

Bone and his colleagues are deeply aware of this imaginative dimension to future visitors' experience. The site will be presented as 'an interpreted landscape', but exactly what information is provided, and where and how, is still being discussed. 'There are so many bewildering things at WARGM. It isn't legible,' says Bone. 'But people will have different requirements. At one level a visit here should just be a pleasant walk in the woods, which you don't easily get in this part of Essex.' Initial orientation will be given in the former explosives magazine (Grade II*) at the south-west of the site, the new entrance; and a fuller exhibition in another building nearby. Intrusive plaques in the landscape will be resisted; one possibility is to install a fibre-optic ring-main for touch-screen consultation of TV monitors, perhaps built into occasional seats. A 'museum designer' will soon be appointed to take these ideas forward.

With interpretation comes the question of future landscape management. Stuart Pearson, landscape architect for the project, points out that the woodland character of WARGM has changed in recent years, with sycamore trees increasingly displacing alder (because of a reduction in the water-table):

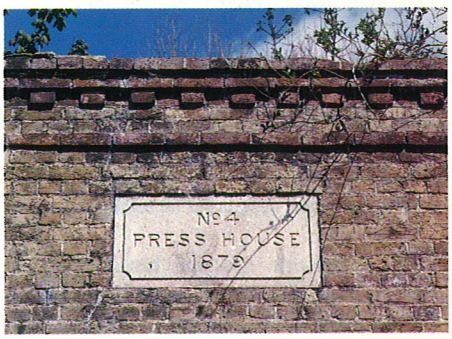


'There is a qualitative difference between walking through alder woods, which support rich habitats, and sycamore woods, which tend to suppress other species – just as there is a qualitative difference between walking through young and mature alder woods. It's important to provide routes which offer a variety of such experiences – and there needs to be a *spatial* sequence, sometimes enveloping, sometimes opening out.'

Just as Pearson hopes that visitors will come to understand a variety of habitats (woodland, grassland, waterside, marshland), he wants as many stages as possible in the site's evolution to be intelligible, not omitting the most recent one of decontamination. But in some instances decontamination has seriously affected the quality of the landscape, as at Newton's Pool on WARGM's northern fringe. Formerly secluded and screened by vegetation, this was discovered only at the last moment by anyone approaching. Pearson wants to restore the screening and the surprise.

Of course, visitors will not be free to wander and explore in quite the same way as now. Some habitats must remain undisturbed; and health & safety requirements will demand that certain structures be approached but not entered. Pearson anticipates considerable use of raised timber boardwalks, which would steer people on defined routes without removing them too much from the immediacy of the landscape.

Those involved in the future of WARGM are at the point where speculations must stop and decisions be made. It is hoped that the first visitors will be admitted in 1999. Up to now this has been a (rare) text-book disposal of an MoD estate, with CIVIX successfully co-ordinating the multi-disciplinary approach that such complex sites surely demand. If the intricacies of public access are handled as adroitly, this unusual, evocative place should continue to cast its spell. □



Opposite page, top: dried-up canal in the southern part of the site. Bottom left: nature at work – brick wall fractured by a sycamore. Bottom right: traverse with stopped clock. This page, top: steel bridge over still-full canal. Left: floor of demolished acid factory. Above: red-brick cornice of No 4 Press House, 1979

CREDITS

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CIVIX
ARCHITECT
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