

Fig. I: One of the five massive fragment of the Gresham Ship raised from the Thames in 2004 (photo by Jens Auer, © Wessex Archaeology)

# London's Elizabethan shipwreck: the Gresham Ship Project 2007–2012

## Gustav Milne

In May 2012, an armed Elizabethan merchant ship began its final voyage. Some 400 years after it sank in the Thames estuary, its remains were carefully stacked onto two low-loaders, and were driven overland to its final resting place. It is now part of a unique underwater museum display in the National Dive Centre at Stoney Cove, Leicestershire, where it also serves as the main focus for training the next generation of nautical archaeologists. But how did this remarkable exemplar of London's maritime history, a 16thcentury sea-going ship from the golden age of Drake, Raleigh and Frobisher, end up in a disused guarry?

This particular tale begins, not at the beginning, but in 1846, when a protracted underwater excavation took place in the Thames Estuary. This pioneering project used hard-hat dive technology, newly developed at ports such as Whitstable by Charles and John Deane. The new methodology had been put to work in Portsmouth in the 1840s, clearing wrecks such as HMS *Royal George* and even Henry VIII's flagship the *Mary Rose*, tasks for which explosives were also used.<sup>1</sup>

The focus in the Thames estuary was another Tudor shipwreck, the aim being simply to salvage as much of its valuable metal cargo as possible. A contemporary comment noted "It had been known long since there was a wreck on the Girdler Sand (off Herne Bay) but no one took any notice of it, not knowing what wreck it was, until this spring when divers went down and examined and recovered some iron guns, of very ancient date, also some of those curious ingots and some iron, lead in pigs and red lead in cast iron casks, covered with wood. .... At the date of this letter, the operations were being conducted under the orders of the Duke of Wellington, as Lord Warden of the Cinque Ports, and the men had then recovered about 2,700 of the ingots, and more iron, pig lead, red lead, together with some stone shot."<sup>2</sup>

The historic significance of the discovery was not completely overlooked, however, for at a meeting of the British Archaeological Association in December 1846, a handful of items recovered from the wreck were discussed. They included a tin ingot stamped with the royal mark (a rose surmounted by a crown); a knife with a double fleur-de-lis stamped on the blade; a round-toed leather shoe

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Fig. 2: the bow section of the Gresham Ship

and a silk doublet of late 16th-century type.<sup>3</sup> Provisional assessment of the material recovered therefore suggested an Elizabethan date for the ship. However, once sufficient metalwork had been recovered and recycled, interest in the site waned and the precise location lost.

But when the Port of London Authority (PLA) began clearance work in the Princes Channel in 2003, to facilitate the passage of modern shipping in the Thames, the remains of the 16th-century ship were dramatically rediscovered. The site lay some 11km NNE of Whitstable on the Kent coast and 22km SE of Southend (Essex). A second underwater excavation project then began, but this time, 150 years later, with rather different aims, technologies and no explosives. Maritime archaeologists from Wessex Archaeology led by Jens Auer (now Assistant Professor of Archaeology at the University of Southern Denmark) were called in to evaluate and record the hull remains and associated artefacts. Iron bars, ingots of lead and tin, pottery and leather were also recovered, together with four guns, one of which had the 'TG' insignia on the barrel as well as the moulded emblem of a grasshopper. This is the

mark of Thomas Gresham (1519–1579), the famous London financier, merchant and gunfounder. The gun is a rare example of an English saker, presumably made at Gresham's foundry in Mayfield, which was in operation from 1567. Further confirmation of an Elizabethan date for the ship was provided by Nigel Nayling's assessment of twelve dendrochronological samples from the hull, suggesting that the timbers were felled in England (probably in Essex or East Anglia) in or shortly after 1574.4

Once the fieldwork in the Thames estuary was complete, the five substantial sections of the carvel-built hull were raised from the sea bed (Fig. 1). They represented a c. 5m section of the bow (Fig. 2), and a c. 15m length of part of port side of the vessel from the keel to the level of the orlop deck (Fig. 3), and included elements of two gunports. The remains were initially transported to Denton Wharf (Gravesend) where further recording took place, and then to a brackish water lake owned by the Ministry of Defence in Horsea, Hampshire. Deliberations then began as to how such an important but unexpected find should be dealt with. Appreciating the unique significance of the discovery for nautical archaeology as well as for London and the long history of its port, the PLA generously agreed to support an innovative five-year research programme coordinated by University College London. Studies of the hull and the ships contents were to be integrated into graduate teaching and dissertation programmes, so that Masters students would be provided with real, relevant hands-on experience to complement and extend their lecture-based studies. UCL was selected as the host, given the Institute of Archaeology's long association with maritime archaeology, with the Nautical Archaeology Society, and with the study of London.

Work commenced in 2007, and a steering group was set up to oversee the programme, chaired by Professor Clive Orton, with Gustav Milne and Dean Sully as project managers for UCL, and Jens Auer from the University of



Fig. 3: part of the port side of the Gresham Ship (scale: Im)

Southern Denmark. There was representation from the PLA (Gill Andrews), the Receiver of Wreck (Alison Kentuck), the Nautical Archaeology Society (Mark Beattie-Edwards), the Museum of London (Hazel Forsyth and Roy Stephenson), the Royal Armouries (Phil Magrath) and Gresham College (Geoff Pavitt).

#### **Hull studies**

Research on the detailed records of the five substantial sections of the vessel itself were conducted at the University of Southern Denmark, using computers and 1:10 scale models, through a series of graduate projects supervised by Jens Auer. These studies show that the vessel was of about 160 tons, 24.5m in length, with a keel length of 19m, and an internal width (beam) of 7.4m. The hold was some 3.4m deep, and the carvel-built hull was strongly framed, furnished with integral gunports.<sup>5</sup> It seems clear that the vessel was reworked during its initial construction to increase the beam and capacity of the hull, a process later referred to as "furring":6 this is the first time such a procedure has been identified archaeologically.

Although the largest vessels of this period were twice this size, the Gresham Ship would not have been considered as a small ship: it was the broadly the same size as the "*Golden Hind*", which successfully circumnavigated the globe in 1577–80, for example. It is known that at least fifteen vessels of a similar size were built in London and the East coast region from 1574–7,7 and thus our ship should be seen as a typical, hardworking armed merchantman of this era.



Fig. 5: the pewter salt holder



Fig. 4: the powder chamber

#### **Cargo and concretions**

The majority of the finds assemblage was transferred to UCL in April 2009 from the English Heritage facility at Fort Cumberland, Hampshire. The work then focused on investigative conservation revealing the contents of twenty-two marine concretions (extensive deposits that have developed around artefacts on the sea bed), followed by the stabilisation of the recovered artefacts. This work was supervised by Dean Sully, with notable contributions by Kelly Domoney,8 Libby McCormick and other UCL graduates working in the Conservation Labs.9 One of the largest concretions contained a powder chamber (Fig. 4), representing an additional gun, while painstaking work on another concretion revealed part of a wooden gun carriage. Other significant (but rather smaller) finds that have now been cleaned, processed and conserved include ceramics, a pewter salt holder (Fig. 5), a silver spoon (Fig. 6) and a copper alloy dish. Organic materials such as leather have also recorded, including part of a seaman's boot, perhaps hurriedly kicked off as its owner struggled to leave the sinking ship.

Meanwhile, Marcos Martinón-Torres supervised the analysis of the metal cargo. Two types of bar iron were recovered, one folded once, the other folded four times, which would form a bar some 5m in total length. The manganese content of some of these bars suggests they may have originated in Sweden. This particular type of bar iron, which is folded so as to be transportable by packhorse, is sometimes referred to as 'voyage iron', since it was used as currency exchanged for slaves from West African coast in the 17th century.<sup>10</sup> The stamped lead ingots were boat-shaped and measured 600 by 220 by 120mm, each weighing *c*. 56kg, while the tin ingots were 520 by 18mm. The isotopic signature suggests the tin is most likely of British origin, but the best provisional match for the lead ingots appears to be Sweden, like the bar iron, although work to confirm this continues.

The guns are currently in the care of the Royal Armouries at Fort Nelson, undergoing a long desalination treatment supervised by their curator, Phil Magrath.

#### Public outreach

With generous support from Gresham College (the London institution founded as a bequest in the will of Thomas Gresham), a series of public lectures on aspects of the Tudor Port of London was held, together with a full-day conference in the Museum of London in Docklands. This was supported by a major display put together by a team of UCL's Museum Studies graduates, under the direction of Theano Moussouri and Ian Carroll, but led by Victoria Kinahan, with additional funding from the Mercers' Company.

#### In conclusion

In May 2012, the five sections of the hull were individually craned out of

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Fig. 6: the silver spoon

Horsea Lake and transported overland from Hampshire to Leicestershire, to become a major exhibit in the National Dive Centre at Stoney Cove. This complex operation was directed by Mark Beattie-Edwards for Nautical Archaeology Society and by Martin Woodward for the NDC. This major move ensures that the remains will be in a secure but accessible location, forming part of a major new heritage attraction for which underwater diver trails are being developed. The Gresham Ship is thus now on public display, albeit 6m underwater, where the unique Elizabethan exhibit will be enjoyed by the c. 30,000 divers of all ages who use the centre every year. The reconfigured 'wreck site' will also be used by the Nautical Archaeological Society to inspire and train the next generation of maritime archaeologists.

The finds from the ship are being transferred to the care of the Southend Museum Service. They will ultimately be displayed in a purpose-built gallery with a theme focused on wrecks from the Thames, appropriately in a brand new museum building overlooking the estuary from whence the Gresham Ship was recovered. Although that lies some years in the future, a temporary exhibition that featured some of the

4. J. Auer and A. Frith 'The Gresham Ship: an interim report on a 16th-century wreck from the Princes Channel, Thames Estuary' *Post-medieval Archaeology* **41/42** (2007) 222–41.

5. K. Alexiou Two 16th Century ships: their hull form and performance (2011) unpublished dissertation for USD MA in Maritime Archaeology; Ni D. Chiobhain The arming of late 16th century merchantmen (2011) unpublished dissertation for USD MA in Maritime Archaeology; C. Thomsen Reconstructing the lines of the Princes Channel Ship (2010) unpublished dissertation for USD MA in Maritime Archaeology. Gresham's artefacts has already been presented in the Central Museum at Southend, from June–October 2012.

The results of the five-year collaborative research programme are being brought together in two volumes, to be published in the Nautical Archaeology Society's monograph series. The first volume will deal with the vessel itself, the second considers its contents and sets the discoveries in a wider context.11 The Gresham Ship Project's studies have thrown new light on shipbuilding and gun-founding, on traffic and trade, and on the port of London in the late 16th century, a 'golden age' of English sea-faring. This was a time when armed merchantman like the Gresham Ship robustly pioneered new trade routes, explored new worlds, circumnavigated the globe and took on the Spanish Armada. For good or for ill, such ships and their redoubtable crews were the making of Elizabethan England.

### Acknowledgements

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7. M. Oppenheim A History of the Administration of the Royal Navy 1509-1660 (1896) 172-4.

 K. Domoney Managing the maritime cultural heritage: a conservation perspective (2007) (unpublished MA dissertation in Principles of Conservation, UCL);
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 K. Domoney Gresham Ship: Princes Channel, Thames Estuary: conservation of an Elizabethan shipwreck assemblage (English Heritage Research Dept Report

Cumberland (Hampshire) and the Royal Armouries based in the neighbouring Fort Nelson, as well as staff from the Museum of London, the LAARC and the Museum in Docklands, not to forgot the teams from the Southend Museum Service and the National Diving Centre at Stoney Cove. The project would not have progressed without the generous spirit of the staff at the University of Southern Denmark and at University College London or without the facilities those institutions provided: but most of all it relied on the professionalism and dedication of their remarkably talented students.

Gustav Milne worked as a rescue archaeologist in the City from 1973, principally on Roman and medieval waterfront sites, initially for the Guildhall Museum, and then for the Museum of London (see p 192). Began lecturing at UCL Institute of Archaeology in 1991, from where he also directed the "Thames Archaeological Survey" and then the "Thames Discovery Programme". Dean Sully is lecturer in Conservation at UCL Institute of Archaeology and the National Trust Advisor for the Conservation of Archaeological Artefacts. He previously worked as a conservator at the National Heritage Board Singapore, Museum of London, British Museum and Monmouthshire District Council Museums Service. Jens Auer worked as maritime archaeologist in Germany and the UK since 1996, directing the excavation of the Gresham Ship in the Princes Channel wreck (Thames Estuary) for Wessex Archaeology in 2004. Joined the Maritime Archaeology Programme at the University of Southern Denmark as associate professor in 2007.

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<sup>1.</sup> P. Marsden Sealed by time : the loss and recovery of the Mary Rose (2003) 21–9.

<sup>2.</sup> Journal British Archaeological Association 2 (1847) 361–2.

<sup>3.</sup> Journal British Archaeological Association 2 (1847) 362.

<sup>6.</sup> C. Wagstaffe 'Furring' in the light of 16th-century ship design (2010) unpublished dissertation for USD MA in Maritime Archaeology.