London’s industrial archaeology

A personal look back over five decades

David Perrett

Although only joining GLIAS in 1974 I have now seen the Society arrive at its 50th anniversary. This article started as a lecture given at the London Archaeologist’s 50th Anniversary Conference in 2018 and follow-up lectures to various societies in and around London. However, my attempts to convert a one-hour lecture into an article originally for the *London Archaeologist* and then *London’s Industrial Archaeology* grew uncontrollably, threatening to become a book on London’s industrial archaeology. So, giving up I decided to write a personal reminiscence of my time in GLIAS where I made lifelong friends and visited countless places, many long gone or now in-accessible. This article misses out much and many things will have been overlooked but I hope that it adds to the history of GLIAS in its fifth decade.

Introduction

It is generally accepted that the term ‘Industrial Archaeology’ was coined by Michael Rix, an extra-mural lecturer at Birmingham University. In 1953, he spoke on the BBC Home Service about the Archaeology of Industry and two years later wrote a short article entitled Industrial Archaeology in the Amateur Historian.[1] He argued that there was a need for greater study and active preservation of 18th & 19th century relics and sites of our industrial past, especially since Britain had led the world in what had been termed the Industrial Revolution. In 1967 Rix enhanced his view in a monograph Industrial Archaeology that was distributed to members of the Historical Association.[2] In 1959 the Council for British Archaeology (CBA) established an industrial archaeology research committee and 1963 saw the first book on Industrial Archaeology, written by Kenneth Hudson (an early Vice-President of GLIAS) published.[3] Those interested in IA started to meet at conferences such as those organised by the late Angus Buchanan in Bath. Michael Bussell in a recent London’s Industrial Archaeology[4] described how these became the Association for Industrial Archaeology (AIA) and the background to the AIA and its journal has been outlined by Marilyn Palmer.[5]

To many, London lacking ‘satanic mills’ was not seen as having a significant role in the Industrial Revolution; that was to be found in the North including my native Yorkshire, the Black Country, South Wales and lowland Scotland. This view is not only misleading but totally incorrect. On the cover of the first GLIAS town trail I quoted from Dodd’s Days at the Factories that said that in 1843 Southwark was as noted for its chimneys as the City was for its church towers.[6] Peter Hall, an economic geographer, states that from 1861 to 1961 a third of the U.K.’s industrial activity was in London.[7] London has always been the great provider and a significant centre of industries both large, such as shipbuilding and armaments, and small, in a multitude of craft industries.

In 1967 Aubrey Wilson’s London’s Industrial Heritage was published although detailing just 58 sites it remained for the next four decades almost the only book on London’s IA.[8] In 1957 The Thames Basin Archaeology Observer’s Group (TBAOG) was formed by Francis Celoria, a traditional archaeologist but keen on local history including industries. He later became Director of the Gladstone Pottery Museum in Stoke-on-Trent. In February 1966, he encouraged the formation of a small TBAOG sub-group interested in industrial archaeology. The group, included John Ashdown, Michael Bussell and Paul Carter, started to compile a gazetteer of London’s Industrial Monuments. Apparently independently Denis Smith, who taught engineering at West Ham College (now part of the University of East London) had started to compile information on IA sites in East London and the Lea Valley. On December 1st 1968 a meeting was called at the Science Museum, South Kensington to gauge the interest in London’s IA. Some 130 attendees heard lectures

Figure 1. A GLIAS party including Bet and John Parker recording in Clink Wharf, Bankside in 1978. *Photographer unkown*

by Dr Norman Smith of Imperial College, the IA photographer Eric de Mare and Nicholas Farrant, the Editor of the London Archaeologist. Denis Smith, who chaired the meeting, showed a film made with the help of his college of the Lilleshall beam engines at West Ham Pumping Station in steam. It was resolved that there was sufficient interest to form an IA society for London. TBAOG wound up on 15th March 1968 with the Greater London Industrial Archaeology Society (GLIAS) being officially constituted at what was termed an 'annual general meeting' on 12th April 1969. That meeting was chaired by Michael Robbins, General Manager of London Transport and a well-known transport historian. GLIAS' first chair was Alan Thomas, with eight committee members and Michael Robbins accepted the role of Honorary President. The meeting saw the launch of the TBAOG's *Industrial Monuments of Greater London Survey*, a 64-page booklet listing the major IA sites in each London Borough.[9] Some 330 sites are detailed plus an appendix by Maurice Bawtree listing the coal duty posts around London. It was illustrated with a few simple line drawings.

GLIAS's early days were outlined by Denis Smith and Godfrey Oxley-Sidey in the Society's 25th Anniversary booklet[10] and in Michael Bussell's account in LIA17[4]. From its start, members received a bimonthly newsletter covering a wide range of IA topics. These have been digitised and are on the Society's website.[11] They have proved remarkably useful to researchers worldwide since they often provide the only reference to buildings and industries now lost. In 1979, the Society commenced London's Industrial Archaeology, which after an erratic start, is now published annually with articles from both members' research and professional archaeology groups. Over the decades, GLIAS also published a range of publications ranging from a series of IA walks in London to site surveys such as the detailed report on the beam engine surviving at Wrotham Park.[12]

IA in London in the mid-1970s was totally different from today. The docks were starting to close, the Thames east of Tower Bridge was lined with emptying warehouses, many craft-based workshops still operated and a number of public utilities still ran steam powered pumps even beam engines. A number of significant sites, such as Tower Bridge and the Thames Tunnel were not listed. The London Hydraulic Power Company was supplying water at 700 psi to equipment in central London and Docklands, including Tower Bridge, until its closure in 1977. Almost the first recording activity undertaken by GLIAS was a training day in St Katharine Docks, which had closed in October 1968. The result was an article in *London Archaeologist* by Paul Carter then Secretary of GLIAS. A recording group was established to make a photographic record of this changing landscape. Attention was focused initially on the riverside warehouses where, in the pre-Health & Safety era,

access was usually readily given. Figure 1 shows a GLIAS team recording machinery in Clink Wharf, Southwark in 1978.

From the late 1960s a small number of IA classes ran in London. Having attended a short course in spring 1974 in Croydon where I lived at that time, I realised that IA was something that combined many interests. I joined both GLIAS and the industrial history section of my native Yorkshire Archaeology Society that summer. Come autumn I set about finding a suitable evening class to extend my knowledge. In Autumn 1972 Denis Smith, who was running a WEA class in NE London, was asked by London University extra-mural department to start a course at Goldsmiths' College. It was this class I joined in 1974 and there met some 25 keen students of IA from varying age groups and with many interests. Members of this class are still active in GLIAS. Before I joined, the class had been recording in Woolwich Dockyard, an activity that included saving Rennie's cast-iron anchor forge building of 1814, which now houses the working wrought iron rolling mill on the Ironbridge Gorge Museum's Blists Hill site. The survey of IA sites in South-East London compiled by this class was published in 1982.[13] By the end of the decade other classes were running, Denis asked me to teach one in Richmond, Bryan Woodriff ran one at Kingston Polytechnic and in Central London GLIAS members ran courses at City Lit, Morley College and Birkbeck College.

Docklands

Without doubt the biggest challenge facing GLIAS in the 1970s was the closure of London's deep-water docks and the associated infrastructure e.g. ship repairers, chain-makers etc. In 1974, the Port of London Authority (PLA) covered nearly 5000 acres, dozens of docks and basins, hundreds of warehouses, miles of roads and railways and many utilities such as pumping stations. At first the docks stood empty and relatively quiet but in 1981 the London Docklands Development Corporation (LDDC) was established and started the mammoth task of opening up docklands by facilitating massive developments. The nearer the docks were to the City of London, the more attractive they were for commercial development whilst the more easterly docks were considered for shopping and related developments. The biggest developments were in the West India Docks where most of the historic docksides have been given over to the giant skyscrapers occupied by major corporations.

Building the docks had led to many developments in both engineering and industrial architecture. The basins themselves were heroic feats of civil engineering with novel services such as pumping and impounding stations. New concepts in both wood and cast-iron framed structures, of fireproof construction, and high security were developed in the London Docks. In the late 1970s few were interested in recording the changes. Ron Fitzgerald, then at the London Museum, and then Chris Ellmers from The Museum of London (opened in December 1976) started to collect artefacts dumped in dock buildings as well as the PLA's archives. The idea of a large industrial museum, as in many other industrial centres, to showcase London's industrial heritage never materialised though many Dockland-linked artefacts are now displayed in the much smaller Museum in Docklands. Paul Calvocoressi from GLC Historic Buildings stressed the importance of recording the riverside buildings. Denis Smith raised support from sources including the LDDC and GLC to establish the Docklands History Survey based at North East London Polytechnic and Dr Bob Carr was appointed survey officer. A preliminary report was published in 1982 followed by the full report in 1984. Except for a few preserved structures such as the 1802 warehouses in West India Dock some now housing the Museum in Docklands, a few characteristic cranes and of course the docks themselves. Docklands is now unrecognisable being covered in either high-rise office towers or, as on the south bank, in high-density housing. Almost every surviving riverside warehouse is now luxury accommodation.

Public utilities

In some ways, public utilities presented less of a challenge than Docklands since sites were more compact and secure. Some water pumping stations such as Addington in Croydon, and Kempton Park employed steam engines well into the GLIAS era. I arranged many tours to these stations for GLIAS and other IA societies visiting London including the 1982 AIA conference hosted by GLIAS. Even during WWII the Metropolitan Water Board retained relics from earlier times. In particular, Kew Bridge pumping station

Figure 2. One of the surviving Humphrey pumps at King George V reservoir. September 2017. *David Perrett*

including two giant Cornish beam engines was kept secure and interested groups could arrange visits. By the mid-1970s plans were being formulated for a Trust to open Kew as a museum and bring the engines back into steam. This was achieved with the re-steaming in 1975 of the 1820 Boulton & Watt beam engine and the 90-inch Cornish engine the following year. The Trust then started to acquire other engines, such as a horizontal engine from Waddon pumping station on Purley Way, Croydon, after it stopped in 1983. GLIAS made VHS recordings of Waddon and Kempton Park as they stopped. The two massive triples at Kempton, arguably the large steam engines in the world, stopped in 1980 but one has been re-steamed by a Trust. In North-east London in the pumping station on the King George Vth reservoir, which opened in 1913 TWA preserves four Humphrey pumps. (Figure 2). The main part of the pump is below ground so there is little to see in the pump house. These gas-driven pumps were very efficient and are unique in Europe although a still workable one survives in Australia. However, pumping stations even those with architectural merit continue to be demolished. In 2014 we failed to save the Southwark & Vauxhall pumping station of 1845 that stood in the very shadow of Battersea power station then starting to be re-developed. More recently a campaign to save the 1892 Longwater pumping station in Haringey failed.

Sewage pumping stations, for obvious reasons, fared less well. In 1971, GLIAS won the BBC Chronicle prize for IA and the TV film showed Bazalgette's Crossness Pumping Station, with its four Boulton & Watt beam engines and magnificent ironwork, in a very sorry state (Figure 3). This situation continued until a Trust was formed with GLIAS support in 1987. One engine, Prince Consort, was re-steamed in 2003. The other stations on Bazalgette's main drainage system had been modernised since the 1930s so buildings such as Abbey Mills, Western and Deptford are well maintained but now house electric and diesel equipment. Until the privatisation of water systems, Bazalgette's main drainage system was always maintained and operated by local bodies, firstly the Metropolitan Board of Works, then from 1889 the London County Council and finally the Greater London Council until 1989 when Thames Water was established. Some local authorities in London had built pumping stations to solve local drainage problems. In 1895 West Ham built a station very close to Abbey Mills that now houses two very derelict Woolf Compound rotative beam engines by the Lilleshall Company of Shropshire. Other early projects were the Markfield Road Pumping station in Tottenham, where the rotative beam engine by Wood Brothers of Sowerby Bridge, Yorkshire, built in 1886

Figure 3. A rusting Cathedral of Sewage. Crossness February 1978. *David Perrett*

had worked until 1964, and is now preserved and steamed regularly, and the sewage pumping station at Low Hall Farm built for Walthamstow Urban District Council in 1877 now housing a museum of steam and transport. The storm water pumping station in Shad Thames that used gas engines was professionally filmed with GLIAS's help and a digital version of the film can now be seen via the BFI archives channel.[14]

Gas industry

London was once the world centre of the gas industry. The world's first street gaslights were demonstrated in Pall Mall by Winsor in 1807. Throughout the Victorian era the industry grew rapidly but the multiple early concerns came to be dominated by two giants: South Metropolitan Gas Company (south of the Thames) and the Gas Light & Coke Co to the north. Until the conversion to natural gas in the early 1970s both companies produced coal gas from giant sites in London storing the gas in large numbers of characteristic gas holders. Due to the pollution risk, on closure gasworks were rapidly demolished and the sites decontaminated. The O2 dome stands on land once occupied by the South Met's giant works. Although the works themselves disappeared, their gas holders continued as storage for natural gas until recently. An important article in LIA[15] by Brian Sturt drew attention to these significant townscape features with dozens sited around London. GLIAS vice-president Malcolm Tucker was commissioned by English Heritage around 2005 to survey the holders remaining in London and report on their significance but this report is unpublished. GLIAS and others have battled to preserve some at least of the most notable holders. The holders outside Kings Cross were dismantled, their ironwork restored and now form a shell around a housing complex. At Fulham gasworks the future of the world's oldest surviving holder (constructed 1829–30) is currently being challenged with a planning application to build a large number of homes on the site. Local opposition to the demolition of the giant No 1 holder at East Greenwich built 1884–88 was strong but it occupied a valuable site near to the Blackwall Tunnel and in 2020 was removed. It is unlikely that more than a small number of holders in London will be preserved.

Hydraulic power

Before the arrival of City-wide electricity, the supply of a ready source of energy to businesses was difficult. Hydraulic power had been used in the docks from the 1850s to drive winches and hydraulic jiggers and to move lock gates and bridges with pressurized water stored in accumulators. GLIAS opened the accumulator tower at Regents Canal Dock, now owned by the Canal & Rivers Trust for London open house events for many

Figure 4. Robin Brooks throwing the switch in Dorset Rise D.C. converter station in December 1983.
David Perrett

years. In 1871 a public utility to supply water at a minimum of 700 psi through iron pipes below the streets was started. In 1883 it was renamed the London Hydraulic Power Company (LHP) and eventually operated five pumping stations and 184 miles of mains. LHP closed its last working pump house at Wapping in 1977. This station complete with its electric pumps was then used as a restaurant until closure and now stands unused. Another station in Renforth St, Rotherhithe is now residential. Like the docks, Tower Bridge had an independent hydraulic system to raise the bascules etc. The two magnificent steam engines driving the hydraulic pumps, date to the Bridge's construction 1898 are now electrically turned for the public to view. In 1974 a third engine, now in Norfolk, was removed when the bridge was connected to LHP for three years prior to its modernisation.

Electricity supply

Electricity generation in London was ending by the 1980s since the sites and plant were inefficient compared to the giant coal fired stations built near the coalfields in the 1960s. Due to their sheer size recording power stations has been a notable failure of both national bodies and local societies. GLIAS made a single visit to the pioneering Ferranti power station at Deptford just prior to its demolition in 1992. It had visited Battersea Power Station in the early 1970s but was later involved in the struggle to save the iconic building following its closure in 1983. The other iconic station, Bankside (closed 1981), has become the internationally renowned Tate Modern Art Gallery.

London Transport continued to generate its own electricity until Lots Road closed in 2002.[16] TfL's station in East Greenwich, originally built to supply London's tramways between 1902–1910, is still a standby station housing remotely operated gas turbine generators. A few local plants such as the combined heat and power station at Deptford have opened recently. For a period, artefacts relating to the electricity industry were kept in a warehouse on the Old Kent Road. The collection was moved out of London in the 1980s and has since been dispersed.

Without doubt though, my most memorable visit to an electrical station was one to Dorset Rise sub-station organised by Robin Brooks, GLIAS member and LEB engineer, in December 1983. Here high voltage AC current was converted to DC current to drive the presses of the Mail on Sunday newspaper. The station housed two 2.5MW mechanical converters and two banks of 2.5MW mercury arc rectifiers. The outputs from these terminated on a magnificent DC control panel, dominated by enormous air circuit breakers and the associated knife switches. Only one of the converters was in regular use but the station engineers decided to run both for our visit. When the standby converter was turned on there was a massive explosion and molten copper showered around the building. GLIAS members including myself ran in all directions through equipment carrying many thousands of volts to avoid the molten metal. Fortunately, there were no casualties but the shorted-out converter never ran again. (Figure 4)

Transport

The canals of the 1820s passed through countryside outside the then City. The Grand Junction Canal coming from the Midlands and the north entered the Thames at Brentford whilst the Regents canal ran from the Paddington Arm of the Grand Junction to the Thames at Limehouse basin. On the whole this system, at least north of the Thames has remained untouched although it attracts more and more walkers and possibly too many cyclists. Equally canalside structures have changed or been demolished and only this year the battle to preserve the Bethnal Green Gasholders failed. Denis Smith arranged trips on the Jenny Wren canal boat in the 1970s including for the 1982 AIA conference from Camden Lock to Regents Canal Dock, then up the Limehouse Cut returning via Ducketts to Camden. This was a rare event since the canal was a dumping ground for everything so passage required removing ropes from the propeller and much more.

London's first railway was probably one used in constructing the West India Docks ca.1800. The better-known Surrey Iron Railway that ran from Wandsworth to Croydon opened in sections between 1802 and 1803. It was a horse drawn plateway and some remains survive such as stone block sleepers but are rapidly being lost. The plateway was later extended to the stone mines near Godstone and remains such as cast-iron rails were found in the quarries. Member, Paul Sowan, would lift a manhole cover to the side of the A22 and our party would disappear into the underground quarry. I wonder what the passing drivers thought?

In 1808 Richard Trevithick, the Cornish pioneer of high-pressure steam, demonstrated his steam locomotive on a circular track near what is now Euston Station. A plaque to record this is on the wall of University College Gower Street. Science Museum Curator and GLIAS member, John Liffen has questioned how true this location is. Standard gauge railways arrived in 1836 with the opening of the London & Greenwich Railway originally running from Spa Road, Bermondsey to Deptford before being extended to first London Bridge and later Greenwich. To avoid having to purchase too much land the railway was built on a brick viaduct that with 878 arches claims to be the world's largest brick structure. Although widened frequently much of the original structure can still be seen by those, who walk its length. The carriage access ramp onto the viaduct at Deptford station was for years 'lost' in a scrapyard and guarded, as I remember well, by vicious dogs (Figure 5). It was renovated in 2015 and now forms part of a lively entertainment area. The mainline railways of the 1840s terminated on the then outer boundary of the developed land but offered different solutions to crossing the pre-existing Regents Canal. Maybe only the cut-and-cover Metropolitan underground railway system of 1864 caused obvious construction problems. In the 1860s some railways penetrated the central area but their sites were restrictive and their stations e.g., Charing Cross, relatively small. Although the great termini have been threatened with demolition over the decades many retain their Victorian appearance. Waterloo is a rebuild opened in 1922. The GWR started to redevelop Paddington Station in the 1930s in an Art Deco style but fortunately only the office block was completed. The demolition of the Euston Arch became a *cause célèbre* in the 1960s leading to the formation of the Victorian Society and influencing the development of the new subject of IA. Now the 1960s 'new' Euston is being re-modelled for HS2 but without apparently being formally recorded unlike nearby archaeological sites. Although many termini continue others e.g., Holborn Viaduct, Broad St have been lost. However, the biggest unrecorded losses were the railway infrastructure e.g., engine sheds, loco and carriage works, goods depots, hydraulic power system, horse stables, suburban railway stations etc. GLIAS was able to record some sites in the King's Cross Goods Yard

Figure 5. Deptford Railway Carriage Ramp in 1987. *David Perrett*

but the structures were simply too many for our resources. Recently we pressed for fuller recording of King's Cross Goods Station and are very pleased to see the publication of *The Archaeology & History of the Great Northern Railway's Goods Yard at King's Cross* by Pre-construct Archaeology.[17]

The London Underground is justly renowned worldwide for being the pioneer system and increasingly its architecture has been restored. Featured examples of its rolling stock are preserved in the LT Museum in Covent Garden, for which much credit must be given to GLIAS's first President Michael Robbins. What is now the London Overground line runs from Rotherhithe to Wapping through Marc Brunel's Thames tunnel. Built between 1825 and 1843 it is generally considered to be the world's first underwater tunnel. The 1990s saw a major campaign by bodies such as the Institution of Civil Engineers to stop LT lining the tunnel in concrete and preserving Brunel's arch structures between the two tunnel bores. Five unrestored arches were kept at the Rotherhithe end and at Wapping station the original stairs are still in use. The pump house at Rotherhithe was by 1970s roofless and a scrap yard. The Goldsmith's IA class recorded the derelict engine house and then helped to establish a museum in the building. The museum has recently improved access to the original shaft at Rotherhithe and this is now a unique public visit. Tunnel engineering was much improved by the development of the Greathead tunnelling shield. This circular shield 7ft 3in (2.2 metres) in diameter was first employed in 1869 to drive the Tower subway from Tower Hill to Southwark. This cable hauled passenger carrying line was not entirely successful so by the end of 1870 it had been converted to a pedestrian tunnel. From 1894 it was used by LHP to take its hydraulic mains under the river and now carries vital electronic communication fibres and access is not permitted. The entrance on Tower Hill, a small circular structure, is still labelled London Hydraulic Power Company but I know of no one who has been able to gain access. Variants of Greathead's shield were subsequently used in the construction of all further deep tube lines in London right up to today's Crossrail. Particularly memorable visits were made to the disused City & South London Railway's King William Street tunnel. LT staff would unlock a rather non-descript door in the then forecourt to London Bridge Station and you would descend to just above the Northern Line platforms, from where it was possible to walk north to the City. The route did require some climbing above the flooded sections until you memorably came to the remains of WW2 shelters still adorned with *Careless Talk costs Lives* posters. I understand that access is no longer possible and the posters have been vandalised.

Figure 6. The early iron framed Albion Sugar building is rather lost in other remains of Woolwich Dockyard, October 1974. *David Perrett*

Naval and military sites

Deptford's Naval sites

For centuries the Thames was the centre of Britain's naval and military might but decreased in importance as ships increased in tonnage and were constructed of iron. Following the closure of the Royal Victualling Yard in Deptford in 1961, the Rum Warehouses were converted to local authority housing and some other buildings were retained and restored. Shipbuilding at the adjacent Royal Dockyard ceased in 1869 and the site plus most of the buildings were acquired by the City of London, becoming the foreign cattle market until requisitioned by the War Office in 1914. It continued in Government ownership until 1981 when it was acquired by News International for newsprint importation and storage. Now this extensive site is to be developed for housing but the planning process has gone on for some 10 years. All other buildings that GLIAS visited in the 1980s were demolished and archaeological investigations of only the Tudor dockyard were undertaken. Only the two massive shipsheds of 1844–45[19] along with the Master Shipwright's House (1708) now privately owned and outside the dockyard boundary survive.

Woolwich Dockyard

More remains of another Royal Dockyard to the west of central Woolwich. The Dockyard opened in 1512 to build Henry VIII's flagship *Henri Grâce à Dieu.* Like Deptford it was modernised for steam engineering in the 1830s but similarly the increasing size of iron ships in the Victorian era led to its closure in 1866 when its shipsheds were moved to Chatham Dockyard where they remain. As well as remains of docks, a number of buildings survive including the Clock House (Dockyard offices, 1783–1784) and the very tall Dockyard chimney still dominates the area. The important building later occupied by Albion Sugar was older than the now disused boat store at Sheerness Dockyard that claims to be the world's earliest multi-storey iron-frame and panel structure. Except for a few photographs taken on visits to Albion Sugar the building was demolished unrecorded in the 1990s (Figure 6).

Woolwich Arsenal

More recording took place at a second Woolwich site, namely the Arsenal. At its height the Arsenal occupied 1285 acres and employing some 100,000 workers was the largest industrial concern in Europe, possibly the World, during WWI. After a life of nearly three centuries most of the Arsenal closed in 1967, although many buildings continued in Government use for another 30 years. Its impressive stock of historic structures has been well recorded starting with GLC Historic Buildings, with GLIAS member Paul Calvocoressi as one of the team. The task was eventually taken on by English Heritage, who showed that given the resources surveys and recording can be successfully done on large and complex sites. New uses are being found for many of the most historic buildings whilst others are being converted to flats. The use of some of the buildings for a Museum of Firepower as well as Greenwich's local history library was short lived and they were closed in 2018.

Food and drink

Throughout the 1980s most of the historic breweries in London sold off their sites that were often sited both close to the City and near roads and later railways bringing their raw materials in from the countryside. Some merged, some closed down whilst others were encouraged to build new breweries away from London. Only one traditional brewer namely Fullers in Chiswick brews in London and in 2019 they sold the brewing business to a Japanese concern. It was always a pleasure to arrange visits to Young's Ram Brewery in Wandsworth where we were often welcomed by John Young himself. In 2006, Young's in Wandsworth left their historic riverside site, which is now being developed for houses but the historic brewhouse that still houses two locally-made beam engines by Wentworth and Co. has been retained. The engines had been irregularly in steam until about 2000. In 2018 they were once again made to turn using an electric friction drive. In 2020, the brewer Sambrook's were planning to move their brewery to the site. Brewing needs hops and a number of hop merchant buildings e.g., the magnificent Hop Exchange, can still be identified by their agricultural adornments in and around Borough Market.

A related activity, Sarson's vinegar brewery was next to the lines entering London Bridge Station, a journey I made most days on my way to my laboratory in Barts. GLIAS made a detailed study of the brewery on Tower Bridge Road before closure in 1992.[19] The brewery, now converted to offices and homes forms a pleasing complex but unfortunately none of the giant oak fermentation vats made in Peckham have been retained. London became the centre of the notorious gin craze depicted so vividly by Hogarth in his Gin Alley engraving. Distilling on a large scale could be found to the north and east of the City e.g. at Three Mills and Islington and still continues in Kennington where Beefeater Gin is made. However, like the growth of micro-breweries, there has been a massive increase in the number of small gin distilleries in London in the 21st century.

As elsewhere in Britain early flour mills in London were water or wind powered. Tide mills were found on rivers flowing into the Thames such as the Lea and the Ravensbourne in Deptford. House Mill built in 1776 is the largest tide mill complex in the World with 4 waterwheels and Clock Mill rebuilt 1817, just over the lane, houses another 3 wheels. Judging by the numerous place names containing 'mill', there were many windmills in the London area although not all grinding corn. There are relatively few survivors. The tower mill at Brixton has been restored for a second time and in 2020 during the Covid-19 pandemic, ground corn for flour again. Shirley and Wimbledon Mills can be visited. Partial remains of mills can be found on Wandsworth and Clapham Commons and in Plumstead and a new cap is being placed on the windmill in Upminster as I write. Mills for other purposes survive on the River Wandle. Liberty's silk mill, with its intact waterwheel featured on the cover of a London Transport guide to London's Industrial Archaeology distributed in the 1970s, is now part of a craft centre.

Steam power was first applied to flour milling by Boulton & Watt in 1786 in the Albion Mills, sited near the southeast end of the present-day Blackfriars Bridge. Fire and flour dust are not good bedfellows and the mill burnt down only five years later. With the arrival of harder grains from Eastern Europe newer types of milling machinery were needed. Roller mills were built all along the Thames. On Deptford Creek, Mumford's Mill was recorded by English Heritage with help from GLIAS members including myself in 1999. Spillers' giant

Millennium Mill in Silvertown is being prepared for development.

Noxious industries were nearly always situated east of the City where Thames tributary rivers were essential for their processes and prevailing winds would blow the smells away from the City. Tanning and leather manufacturing were centred on Bermondsey until the mid-1980s and some of the last remaining sites were recorded by GLIAS. The superb Leather Exchange and the adjacent leather market are little known survivors of the trade. The chemical trades, often associated with by-products from the gasworks were found along the Lea and on the south-eastern banks of the Thames. Those on the Lea have been described in Jim Lewis's series of books.

Markets

Working all my scientific career in Barts Hospital adjacent to Smithfield Meat Market I could not help but become fascinated by markets, especially those in Victorian structures. When established in 1123 Barts was placed outside the City Walls to avoid mixing healthy and sick citizens and so a few years later the 'Smooth Field' in front of the hospital was considered the best place to slaughter and butcher animals. There may also have been a link between butchery and surgery!

Markets both wholesale and retail have been a feature of London's trades for centuries. Street names in the City such as Cheapside, Bread St and Milk St reflect their earlier purpose that pre-date the Middle Ages. The City closely controlled street markets in London since it charged fees to the stall holders and subsequently built covered wholesale market buildings.

The market on London Bridge, dating from 1014, was owned by Southwark Cathedral. With the dissolution of the Monasteries, the City received a royal charter in 1550 to control all markets in Southwark and earn fees from them. The London Bridge market has been in several locations, but moved to its present site in 1870. Prior to 1999 when the Farmers Market started, GLIAS walks in the area were always atmospheric with shut-up stalls and boxes of fruit. The cast iron buildings date from ca.1870 but only one now housing the Fish! restaurant is dated (1897) . The market was threatened by the construction of what was then termed Thameslink 2000 but this is now finished with little effect on the market. The re-siting of part of the E M Barry-designed cast iron Floral Hall (1858), from the Royal Opera House at Covent Garden, in 2004 enhanced the area. The Market and its surrounding streets are still a mecca for Victorian street furniture.

With the exception of Smithfield Meat Market, the other City wholesale markets were closed over recent decades. In 1982 Billingsgate Fish Market was moved from its historic site to Docklands but the 1872 buildings designed by Sir Horace Jones were converted to an office and conference venue. Spitalfields, a complex of market buildings dating from 1887, was threatened with total demolition on closure in 1991 but a major preservation movement was started. The outcome was a compromise of new city office building and the saving of the 1887 building as a craft market. Leadenhall Market with its ornate roof structure and cobbled floors was designed by Sir Horace Jones in 1881 but, although its last food shop closed relatively recently, is now a bustling eating and drinking quarter for City workers. At the time of writing Smithfield Market is still a working wholesale dead meat market although the interior of the very impressive cast iron building by Horace Jones opened in 1868 was substantially changed to comply with the latest food safety requirements in the 1990s. I missed dodging bummarees with their meat laden trolleys on my way from Barts Hospital to the Medical School in Charterhouse or to the Cock Tavern below the market buildings. To the west of the market various additional markets were built and some of these are presently being converted to form a new home for the Museum of London. Most of the meat trade buildings in the streets around Smithfield have been converted to other uses. Red House, a massive early cold store with an interesting history near to Holborn Viaduct, is being prepared for conversion and Malcolm Tucker and myself were asked to help identify surviving features in 2018. In 2019 the City announced plans to close Smithfield and move it along with its other markets to a new complex near the M25.

Other commodity and financial markets continue in the City but a particularly tragic loss was the Coal Exchange situated opposite Billingsgate Market. Described as 'a landmark in the history of early iron construction' it was demolished in 1962 although the newly established Victorian Society fought for its

preservation. Outside of the City, Covent Garden Market saw a campaign to remove its Victorian iron roof and return it to a simple Georgian structure in the 1970s but, fortunately, this did not occur. GLIAS visited the restoration works taking place in 1980. It is now a prime tourist attraction sheltered from the rain. Another survivor of a Georgian market although now a home for craft stalls and street food vendors is in Greenwich and is still run by the Greenwich Hospital Trustees. Other suburban market halls have been slowly closing, Brentford and Stratford have been demolished, Woolwich market hall is of unusual construction but is very run down, even developments of the 1960s are being redeveloped though others such as Tooting continue to thrive.

Thames crossings

GLIAS' first decade saw the total rebuilding of London Bridge and reconstruction of its predecessor in Lake Havasu City in Arizona, USA. In 1536 the City petitioned to own the Bridge. It has since been managed by the Bridge House Estates Trust now one of the Britain's richest charities with assets of some £1.5 billion. Originally the sole use of its funds was the maintenance, purchase and/or rebuilding of the City's road bridges namely Blackfriars, Southwark, London Bridge and Tower Bridge to which has been added the Millennium (Wobbly) bridge. Recently the Trust has supported other causes. Tower Bridge opened in 1894 a steel structure with stone cladding to blend with the Tower but its IA importance relates to its hydraulically powered bascules. Throughout the 1970s GLIAS frequently visited the bridge including walking the high-level walkways then unglazed and without glass floors (Figure 7). Three steam engines drove the hydraulic pumps: two by Armstrong Mitchell & Co were from 1894 but a third by Vickers Armstrong installed in 1941 was removed to at Forncett St Marys steam museum in 1974 when modernisation of the bridge started. A small vertical 10 h.p. Tangye steam engine drove the Bridge's workshop which was recorded by a GLIAS party led by David Thomas in 1976.[20] The large engines stopped in 1978 when the boilers were declared unsafe. The Bridge Master, Commander Rabbit, phoned my laboratory to say that he would run the engines under steam one last time so I was privileged to be one of very few people to see them running under steam for the last time. The Bridge is now a major tourist attraction with the engines turned by electric drives.

Engineering trades

Many small metalworking and millwrighting sites such as blacksmiths and coppersmiths must have existed in the City from the earliest periods. The Hatton Garden area just outside the City became the centre for jewellery manufacture from Tudor times and still is. The streets here comprise a mixture of many small manufacturing workshops as well as suppliers of jewellery sundries. Clock-making became centred on Clerkenwell and continued there into the 1980s. A few watch repair shops survive there still. The manufacture of stills and coppers for brewers was a major trade and also appears to have centred on the east bank of the River Fleet with the works of Pontifex & Wood starting in 1788 being a major maker. The company developed provincial branches but its toxic lead works moved to Millwall. Other lead works continued on the south bank of the Thames until the 1970s. A shot tower featured in the Festival of Britain site. London did not have the art foundries such as Coalbrookdale and MacFarlanes of Glasgow but the work of the many jobbing metal foundries in London can be found here and around the World. Even after the scrap drives of WWII, coal hole covers, pavement lights and cast-iron fences remain ubiquitous in central London and need serious study.

The world's first steam engine manufactory is known to have been in Blackfriars, where in 1702 Thomas Savery placed a notice in the *Post Man* broadsheet saying his engine for draining mines could be viewed in his Blackfriars workhouse on Wednesday and Saturday afternoons. Later, parts for the much more successful Newcomen (atmospheric) engine may have been made there too. The site later became a gasworks and then the City of London Boys school. Regrettably when what was formerly the school playground was cleared in the 1990s the archaeological investigations focused on the Roman riverside with no investigation of these very significant remains. Although a number of Boulton & Watt engines operated in London it was not until after the expiration of Watt's Patent in 1800 that engine building, especially marine engines, became a major London trade. An amazing survival of a B&W beam engine from Whitbread's Chiswell St Brewery can be seen

Figure 7. Tower Bridge walkway. GLIAS party visit March 1977. *David Perrett*

in Australia, where the 1785 engine can still be steamed in Sydney's Powerhouse Museum. Probably the most famous early London engineer is Henry Maudslay, who trained in Woolwich Arsenal, Maudslay, the pioneer of precision engineering, had constructed the famous block making machinery designed by Marc Brunel for the Royal Navy. Nothing remains of Maudslay's various works even his tomb in Woolwich was dismantled in the 1960s. Some of this machinery survives in Portsmouth Dockyard and more is in the Science Museum. A number of Maudslay steam engines survive but the beam engine of 1838 at Kew Bridge Pumping station steamed for the last time on 25 July 2019. Many makers of fine small engines established their works in London. Engines by various other London makers survive both in situ and in museum collections. Two engines by Wentworth and Co. of Wandsworth are still in the historic buildings of the former Young's Ram Brewery in Wandsworth (see above). A lesser-known engine by this company is being restored in Beeleigh Flour Mill in Essex (Figure 8).

London was a centre of locomotive building and repair with the GER having substantial works at Stratford. I was particularly pleased in 1978 to help record the railway works of George England in New Cross, where removed from any railway lines England and his son-in-law Robert Fairlie built their unique narrow-gauge locomotives some of which are still at work on the Ffestiniog Railway in North Wales.

Large engineering works focused on the docks and ship building trades and few significant sites remain. Adjacent to Deptford Dockyard and recently restored is a former works of John Penn, engineer, who supplied marine steam engines. An engine built here in 1841 still powers the paddle steamer *Diesbar* in Dresden. The massive Thames Ironworks and Shipbuilding Co. operated at the mouth of Bow Creek on the River Thames from 1837 to 1912.[21] Parts of this site were excavated and recorded during the building of Crossrail.

Kirkaldys Testing & Experimenting Works in Southwark St has been a focus GLIAS activities since the mid-1970s. Denis Smith was spotted photographing the building in 1974 and an occupant invited him to come inside. The interior was not only a complete Victorian engineering workshop but contained a unique and giant tensile testing machine designed by David Kirkaldy in 1863. Denis put together a short presentation for

Figure 8. Wentworth of Wandsworth rotative steam engine in Beeleigh Flour Mill, Essex in August 2012. *David Perrett*

his Goldsmiths class and on the 18th January 1975 a class visit to start recording the building took place. Further visits were made over the next months and, at the AIA conference in Durham, Denis made a presentation on Kirkaldys that excited much interest among Government and Museum attendees including Neil Cossons, then Director of the Ironbridge Gorge Trust. Denis developed a plan for a museum and this achieved charitable status in 1983. It has been regularly open to the public since then.[22]

To my particular fascination when travelling both in Britain and abroad, I see that towns of all sizes have preserved their old fire-engines, especially the steam powered ones. No doubt influenced by fires in the City, London became a centre of fire engine manufacture and engines from Shand Mason, established in 1860 in Blackfriars and Merryweather (also noted for tram engines), established in 1690 in Covent Garden, but moved to Greenwich in 1897 where their works survived until recently, are found worldwide.

Craft industries

Many much smaller concerns from craft workshops to small manufacturers have operated in London. Patronage by the Nobility, the State and the Church led to the success of such small concerns. No particular trade is associated with London in the way that say lace manufacture was centred on Nottingham. Their premises usually have no distinguishing features and recording such works often had to rely upon the local

knowledge of members, serendipity and sharp observation by those walking the streets. Maybe the only obvious example was the silk industry of Spitalfields. Here the rather derelict properties in especially in Fournier Street just east of the City were in multi-occupation. The houses had been the homes and workshops of wealthy Huguenot refugees and their magnificent doorways and the silk weavers' loom workshops were still intact. Throughout the 1970s and 80s GLIAS members led tours around this then lesser-known area. Brick Lane was dominated by Truman's Black Eagle Brewery but some small workshops related to furniture making and similar trades continued in side streets and alleyways. I remember taking a party from a regional IA society around Spitalfields one Sunday in 1980 when we were stopped by the police since they suspected we were a National Front march! Now the silk weavers' houses sell for many millions and the ethnic restaurants of Brick Lane feature in tourist guidebooks. The silk industry was also to be found in the suburbs. Liberty's silk mill with its undershot waterwheel powered by the River Wandle stood neglected for many years but is now a popular craft centre. For many years I lived in Streatham and was very familiar with the P. B. Cow gum works at Streatham Common since it was next to a favourite Young's pub. It was only when plans were submitted to clear the site in the 1980s that the significance of the building was recognised. The gum works occupied a Georgian building that was probably built around 1820 to house the first Jacquard-type silk weaving looms in Britain. As a result of GLIAS' representations, the mill was 'listed' and a public enquiry was held in March 1987 to consider Sainsbury's application to demolish it. Both GLIAS and English Heritage produced schemes to show how the mill could form an attractive facade to their proposed supermarket. David Thomas along with the late Brian Bloice led this very successful campaign so you can still shop in a silk mill (Figure 9). A similar silk mill in Lewisham was lost beneath a Tesco.

Most histories of silk weaving in London say that the craft had died out prior to WWII so I was very interested to receive a phone call one evening in January 1981 from a Mr Sindall. He said that I might be interested to visit the textile works he and his twin brother owned in Hackney since they were retiring and the business sold. On 15th January I paid a lunchtime visit for a reconnaissance and to my great surprise the door in a non-descript back street opened on to a complete fine textile business still at work. A narrow-fabric hand loom weaver was weaving silk in the attic using a loom purchased in the 1870s and a ropeyard making tassels and cords occupied the ground floor. Over the next weeks a number of recording visits were made to the firm. Denis Smith recorded the brothers' reminiscences[23] and the Museum of London collected some looms etc. that I hope are still in their store.

Too often small works are just part of the streetscape, they are always there and then overnight they disappear un-noticed and unrecorded. For years there was a small measuring scale works next to my station in Brockley and I kept saying that one day I'd knock on the door. In the blink of an eye, it became a second-hand car lot. A better fate befell the nearby workshop in Borland Rd, Nunhead, occupied by the Gandolfi Brothers, who supplied their hand made wooden cameras to Scott's expedition to the South Pole. In 1974 they featured in one of then-GLIAS Vice President Kenneth Hudson's *Industrial Grand Tours* videos, now on YouTube, and a centenary exhibition at the Science Museum in 1980. A GLIAS member, who lived abroad, said that the printers he used in Peckham were still letter-press printing. A visit in 1990 found the Cutts Brothers pleased to show us around. Nearby in Peckham, Carty & Co manufactured the large vats used by brewers and many were also in use in Sarson's Vinegar when GLIAS recorded the site (see above). A book about Carty was published by the Science Museum in 1998 just as the firm closed. and only the Georgian office building survives.

Hatton Garden continues to be the jewellery quarter but the related trades of watch, clock, and scientific instrument making have vanished. In the 1970s when I started at Barts I could break equipment such as laboratory glassware, walk into nearby streets with their glass-blowing workshops and come back with repaired items. Similarly, electric motors could be rewound over a lunch break and, of course, it was easy to get stopwatches and timers repaired. But these workshops vanished with the changing character of Smithfield and Clerkenwell in the 1980s and little recording other than some by Chris Ellmers from the then new Museum of London. I puzzled over why the Tesco wholesale butchery offices opposite Barts had a Lion statue in its first-floor alcove. Only recently when speaking at a conference in the Museum of Docklands a fellow speaker said he had been born there, which was the Herbert weighing scale manufactory that had

Figure 9. Streatham Silk Mill. August 2019. *David Perrett*

been established in the City ca.1740. His family lived on the top floors, the saleroom was on the ground floor and the metal scales were cast in the basement. His family firm left Smithfield in 1959 and their factory making electronic scales is now in Haverhill. A set of fishmongers' scales complete with a Lion statute now sits in my front room.

GLIAS visited and recorded many workshops east of the City. These ranged from skin processers off Brick Lane to Bryant & May's match works and cricket ball makers. A particularly interesting visit was to Englefields Pewterers in Wapping in 1983 where wooden moulds dating to the 1750s were still in use to make its Rose & Crown cast tankards (Figure 10). The firm was acquired by Selangor in 1987 and production was moved to their ultra-modern premises in Kuala Lumpur, Malaysia that I visited two years ago but still using traditional methods. One of GLIAS' earliest members, George Arthur, worked in a similar small workshop, Lowne Instruments, in Lewisham and arranged for the works to be recorded in detail before it closed in 2002. The company had been in existence for over 150 years[24] and much of their equipment was of a similar age. They had specialised initially in the manufacture of air flow meters for mines etc. but later also made electric clocks and timepieces (Figure 11)

A major challenge in 2018/9 was the campaign around the closure of the Whitechapel Bell Foundry with high profile efforts to keep the foundry working appearing in the media. The foundry owners rapidly sold off most of the contents via the web leaving the more recently rebuilt foundry buildings relatively empty. The attractive early office front remains at Whitechapel but a plan to include it in a hotel development is about to be the subject of a planning enquiry. The campaigners seemed unaware that a larger bell foundry, visited on a GLIAS coach trip in 1986 still casts in Loughborough, and Gillet & Johnson cast bells in Croydon from 1844 until moving to Bletchingley, Surrey in 2012 where they still cast bells.

Recording in London has become more difficult with a phenomenon in development appearing from the mid-1980s. Government, government bodies, local government and private developers acquired sufficient amounts of land to request the wholesale re-development of vast areas, which nearly always consisted of relatively cheap industrial or brownfield sites. The scale of these massive developments presents new challenges to both official and amateur bodies in recording the archaeology of these areas. Development of the Olympic site with the need to open in 2012 moved so fast that little recording took place. GLIAS tried to make a photographic record but even that was too much for us. Not surprisingly many of the photographs taken then appear to be unique and with many requests for copies since.

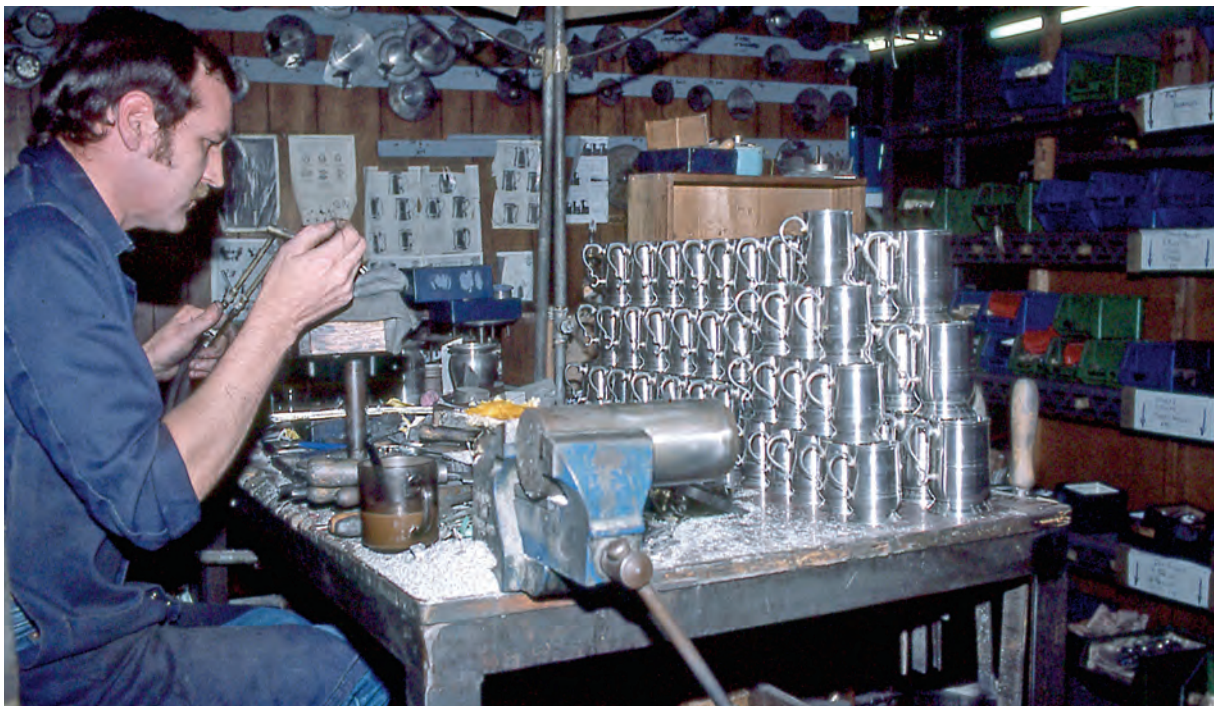

Figure 10. Finishing cast pewter tankards in Englefields Pewterers. Whitechapel 1983. *David Perrett*

GLIAS post-2000

Lectures and conferences

From the very beginning an annual lecture was delivered after the Society's AGM had been held and many members gave *ad hoc* lectures on IA to others such as local history societies. However, it was only in 1976 when a member offered the regular use of a lecture theatre in the City of London Polytechnic that a series of IA lectures started, from a few miscellaneous dates in the late 1970s to our regular series of lectures on the third Wednesday of the month. Moving first to City & Islington College and then for many years the lectures were held in various lecture theatres at Barts Hospital Medical School. Now our long-time member Alan Baxter generously gives the Society use of the lecture room in the basement of his offices in Cowcross St. Nearly 250 lectures have been given by invited outside speakers and GLIAS members to members as well as the general public. All have been free as part of GLIAS's role as an educational charity. The largest audience being some 150 to hear our chair Denis Smith speak about Sir Joseph Bazalgette at a time when Bazalgette's name was hardly known outside a small group of historians interested in London's infrastructure. GLIAS lectures continue to be given. Details of the lectures from 1976 to 1994 were given in the 25th Anniversary booklet and the list has been updated by Andrew Turner in the Appendix.

In 1981 some GLIAS members along with the secretaries of other IA and related societies in South East England met at the home of Brenda Innes in Bromley to discuss a regional grouping of IA societies. It was readily agreed that an annual IA conference should be established in the region along the lines of those already running in other parts of the country. The annual conference, entitled SERIAC, would rotate around the region. The first SERIAC was held in April 1983 at The University of Surrey and has been held annually since. On behalf of GLIAS and in conjunction with a few fellow members I have arranged all the SERIACs hosted by GLIAS. The first of these was in 1987 at the Museum of London, in 1991 at the Science Museum arranged with Sir Neil Cossons then Director of the Museum, in 1997 at University of Greenwich (Avery Hill), in 2003 at University of Greenwich (Old Naval College), in 2008 at University of East London (Docklands) with SERIAC's largest attendance (280 delegates) and in 2014 Royal Russell School, Croydon arranged with Paul Sowan. Unfortunately, the conference for 2020 that was also to commemorate GLIAS@50 and was to be held at Goldsmith's College, had to be cancelled close to the date due to the Covid-19 pandemic. Over the decades SERIAC had made an accumulating financial surplus that is offered as research bursaries but there have been few applicants.

Figure 11. George Arthur operating a very old gear cutting lathe. 2002. *David Perrett*

Oddly the 25th Anniversary Booklet does not mention GLIAS hosting the Association for Industrial Archaeology in 1982. This proved to be a massive organisational challenge for the Committee and the organising group. The week long conference was residential at Imperial College, South Kensington and there were over 200 delegates from around the world including the Smithsonian Museum in Washington. As well as the standard lectures we ran many visits to working sites around London. We even had a preserved RT bus to take delegates around. The RT was a god-send for the unique visit I arranged to walk through Brunel's Thames Tunnel after the evening tube services had finished at 1am. How do you get 100 delegates without cars back to Imperial from Rotherhithe at 3 o'clock in the morning? – pile them on to an over-filled RT bus of course. Unfortunately, this conference was held before the AIA published regular guides to the IA of the area being visited. I also helped arrange some of the visits that touched on South London for the AIA Kent conference in 1999. This event was followed by some of our members organising an AIA conference based at the Hatfield Campus of the University of Hertfordshire in 2004 focusing on Hertfordshire and the Lea Valley in East London. Tim Smith and Bob Carr compiled that region's guide.

London visits

In the early years, visits in London were relatively easy to organise and we were always welcomed by the staff but the rise of stricter Health and Safety requirements plus the loss of suitably interesting factories e.g., newspaper printworks and breweries in the region made visits more difficult. In addition, many visits that we made regularly such as Tower Bridge, Crossness and the Post Office Railway became museums and open to the public. GLIAS had since 1972 organised daytrips further afield. In May 1976, I organised a rail trip to look at IA sites in Exeter where I had been to university. I still have the documentation that shows that I made a group booking for 40 people with BR for just £3.50 each! The day memorably finished with the consumption of rough cider direct from the barrels in a back-street pub I knew. A trip in July to Liverpool followed and then in June 1977 one to Birmingham. After that I organised two coach trips each year to IA sites around Britain, some such as to Elsecar in South Yorkshire a long way in a day! A list of the trips I ran from 1976–1994 can be found in the 25th Anniversary booklet. After that I ran just three more: to Warwickshire (July 1994), to Somerset (Sept 1995) and Suffolk (July 1996). Changes to the coach driver's permitted hours limiting the distances we could travel, the difficulty of pick-ups in central London and increasing restrictions on the numbers that could be shown round sites led me to stop what had been immensely popular outings

London's IA in print

Unlike many regions in Britain, few general books on London's IA have appeared. Wilson's 1967 *London's Industrial Heritage* with photographs by Joseph McKeown used market research tools to identify its sites. This book[8] is now a collector's volume. The TBAOG booklet has already been mentioned. The Goldsmith's College IA group compiled a detailed survey of IA sites in south-east London excluding Southwark. Affectionately known as SELIA, this booklet was published in 1982. Sadly, similar volumes for other London areas have not been forthcoming. The challenge of writing comprehensive books on Britain's regional IA was taken up by many local IA societies around 1980. Batsford started such a series but very few volumes came out and the series transferred to Manchester University Press, who produced even fewer. GLIAS had taken on the challenge and signed contracts with both publishers and with Derek Holliday, who died very sadly at an early age, and Julia Elton, as general editors. Individual members with particular expertise wrote comprehensive chapters on particular topics such as railways, public utilities. As previously mentioned, Docklands had already been well documented. These chapters were to form half the book, the rest being a major borough by borough listing of IA sites. The scale of the task proved too much for the authors, who all had full time jobs, and the manuscript was never completed. In 2001, Denis Smith's *London's Civil Engineering Heritage*[25] was published and drew upon some of the work done for the Batsford's book. Much of what was written still sits in my office!

The gazetteers compiled for the Batsford's book along with SELIA found use as the basis of the GLIAS computer database, developed by Chris Grabham around 2000, received the AIA recording award in 2002. Subsequently this version was significantly developed by members of the YAS Industrial History Section under the guidance of our late member Robert Vickers. We are now populating that new database.

Over the lifetime of GLIAS many books on London's railways including the underground system have appeared, as have a few books on specific topics relating to London's industrial heritage e.g. The Thames Tunnel, Crystal Palace etc. From about 1999 two authors started to write detailed but specific book series. Jim Lewis has written extensively on the technological developments that occurred in the Lea Valley and Stephen Halliday has focused his books on Bazalgette and wider aspects of London's main drainage. Recently a number of books on London's industrial heritage have appeared. One by Geoff Marshall[26] using the same title that Wilson used in 1967 provides an overview of many of the main industries found in London but does not include site details. Recently a similar volume by Mark Amies was published.[27] A book on the power stations and gasworks[28] has also appeared.

The value of the information in our journal *London's Industrial Archaeology* and the GLIAS Newsletter cannot be ignored. Writing this article, I would often need to check facts about sites using Google and what would usually be top of the hits but our publications – a mark of our success over the last five decades.

Preservation in London

When my interests in London's IA first developed, other than the Science Museum, there were no museums of interest in the area beyond a couple of preserved windmills such as Brixton Mill. GLIAS has always taken a view that it would not directly be involved in preservation projects but would support the formation of Trusts to help open the site. This was the model at Crossness, the House Mill and Kirkaldy's among others. There are now a number of industrial museums in London, which I hope will survive the current Covid-19 pandemic. Many though are run and operated by volunteers, who are aging and maybe unwilling to continue even when the pandemic has passed. With their departure there will also be a loss of operational and engineering expertise. The need for new blood to join the industrial heritage field is becoming essential; London needs these sites to continue to truly reflect the importance of London's industrial heritage to all.

The author

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Appendix
Twenty-five years of GLIAS lectures, October 1994–May 2019

Compiled by Andrew Turner

1994–5 *Lecture Theatre 3, St Bartholomew's Hospital, Charterhouse Square*

Oct	Chris Ford	Gravel to Guns – The IA of Greenwich
Nov	David Perrett	Victorian Markets
Jan	Sue Hayton	Europe's Industrial Heritage
Feb	James Douett	Temples of Steam
Mar	Valerie Bott	The National Fairground Museum

1995–6 *Lecture Theatre 3, St Bartholomew's Hospital, Charterhouse Square*

Oct	Mary Mills	Chemical Industry in London
Nov	Brian Strong & Michael Burkham	Three Mills – Their Story and Area
Jan	Percy Reboul	The Early History of Plastics
Feb	John Greenwood	Textile Printing and London's Silk Industry
Mar	Peter Stokes	Canals and their Water Supply

1996–7 *Lecture Theatre 3, St Bartholomew's Hospital, Charterhouse Square*

Oct	Harry Pearman	A Mole's Eye View of London and the South East
Nov	Fred Bishop	The Dale in London and Beyond
Jan	David Goodall	How the Steam Locomotive Works
Feb	David Leaback	The London Sugar industry
Mar	David Wilkinson	The Crossness Project

1997–8 *Lecture Theatre 3, St Bartholomew's Hospital, Charterhouse Square*

Oct	Christopher Salaman	McNamara's Commercial Road Carriers in London
Nov	Frances Ward	Blackwall Tunnel Centenary
Jan	Shane Gould	Industrial Archaeology in Essex
Feb	Malcolm Holmes	The Midland Grand Hotel, St Pancras
Mar	Malcolm Tucker	Recording the Thames Tunnel

1998–9 *Lecture Theatre 3, St Bartholomew's Hospital, Charterhouse Square*

Oct	David Burns	The Industries of the Abyss – Spitalfields
Nov	John Liffen	The Waterloo and City Railway – its Origins, History and Archaeology
Jan	Ray Riley	Industrial Archaeology in Poland
Feb	John Corker	The Kempton Park Engines Project
Mar	Tom Standage	The Victorian Internet
Apr	GLIAS Members (inc Tim Smith, Chris Grabham)	Recording London's Industrial Heritage

1999–2000 *St Bartholomew's Hospital, Charterhouse Square*

Oct	Peter Stokes	London: The West Country's Engineering Window to the World
Nov	Christopher Sugg	The History of Street Lighting
Jan	John King	London's Airports: their first 50 Years
Feb	Cancelled	
Mar	Andrew Norris	Conservation of Abbey Mills pumping Station

2000–1 *Lecture Theatre 2 St Bartholomew's Hospital, Charterhouse Square*

Oct	John Wallsgrove	London's 'Unknown' Historic Bridges
Nov	Micheal H Goodall	Goodall & Son: A London Printing Business
Jan	David Dewing	London's Furniture Industry
Feb	David Elliot	Sir John Elliot: The Last Managing Director
Mar	John Greatrex	The Great Exhibition of 1851

2001–2 *Lecture Theatre 2 St Bartholomew's Hospital, Charterhouse Square*

Oct	None	
Nov	Michael Bussell	A History of Concrete in Structures
Jan	Stephen Halliday	The Great Stink: Bazalgette and the Cleansing of Victorian London
Feb	John Liffen	The Patent Office Museum: The first Industrial Museum?
Mar	Don Clow	The Streets of London
Apr	Normal Paul	The Royal Gunpowder Mills (AGM)

2002–3 *Lecture Theatre 2 or 3 St Bartholomew's Hospital, Charterhouse Square*

Oct	Gerry Moss	The Mystery of Coade Stone
Nov	John Porter	From Tyne to Thames: Restoring HMS Cavalier
Jan	Chris Rule	London's Type Founders
Feb	Sue Hayton	Below your Feet and Above your Head: Street Furniture
Mar	Brian Strong	Distilling in London
Apr	Video Programme (AGM)	

2003–4 *Morris Lecture Theatre Robin Brook Centre St Bartholomew's Hospital*

Oct	None	
Nov	None	
Jan	Rob Cartright	James Henry Greathead and the London Tube System
Feb	Roderick Shelton	St Pancras 1865–2007
Mar	Barry Barton	Water Towers of Britain
Apr	Denis Smith	Henry Bessemer, Man of Steel (AGM)

2004–5 *Morris Lecture Theatre Robin Brook Centre St Bartholomew's Hospital*

Oct	None	
Nov	Paul Calvocoressi	From St Katharine's Dock to Woolwich Arsenal
Jan	Brian Bloice	The History & Architecture of Shipping
Feb	Dorian Gerhold	The Industries of Wandsworth
Mar	Denis Smith	The Bicentennary of Joseph Lock and Thomas Brassey
Apr	Brian Sturt	Coals to the South Met, how the South Met received their Coal Supplies

2006 *Derek Willoughby Lecture Theatre 2 St Bartholomew's Hospital, Charterhouse Square*

Jan	Alan Vessey	Napier's, Engineers of London
Feb	Tim Smith	Hydraulic Power in London
Mar	Angus Buchanan	Brunel at 200
Apr	Edward Sargent	Civil Engineers of the Royal Dockyards (AGM)

2007 *Morris Lecture Theatre Robin Brook Centre St Bartholomew's Hospital*

Jan	Denis Smith	Thomas Telford @ 250
Feb	Dave Perrett	London's Markets and Market Halls
Mar	Malcolm Tucker	Cast Iron Bridges in London
Apr	Frank Turner	Sea Forts of the Thames & Medway (Paul Garrod lecture theatre)
May	Neil Rhind	William Webster, Builder of Crossness & the Thames Embankment (AGM)

2008 *Morris Lecture Theatre Robin Brook Centre St Bartholomew's Hospital*

Jan	Cancelled	
Feb	Tony Earl	Kodak & Photography in London
Mar	Brian James-Strong	Sir William Fairbairn (1789–1874)
Apr	Richard Hartree	John Penn & Sons, Engineers of Greenwich
May	Mark Hows	Some Unusual Railways (AGM)

2009 *Morris Lecture Theatre Robin Brook Centre St Bartholomew's Hospital*

Jan	Michael Bussell	The end of the Pier
Feb	Tim Smith	Say Sarsons Not Vinegar
Mar	John Porter	Stationary Steam – Still Working, Still Sweet
Apr	None	
May	Michael Bailey	Robert Stephenson – Eminent Engineer (AGM)

2010 *Morris Lecture Theatre Robin Brook Centre St Bartholomew's Hospital*

Jan	David Perrett	Days at the Factory – The London Version
Feb	Martin Adams	London's Smallest Factories – The Fermentation Industries
Mar	John Liffin	Searching for Trevithick's London Railway of 1808
Apr	Jim Lewis	London's Lea Valley – London's Best kept Secret
May	Peter Darley	Camden's Railway Heritage (AGM)

2011 *Derek Willoughby Lecture Theatre St Bartholomew's Hospital, Charterhouse Square*

Jan	Dan Hayton	Computers in London – History through Archaeology
Feb	Sue Hayton	British Engineers in Europe
Mar	Chris Rule	Wells-Brimtoy – London Tin Toy Makers
Apr	Chris Lewis	William Henry Barlow, an Eminent Victorian Engineer
May	Marilyn Palmer	Comfort and Convenience in the Country House – and Archaeology of the Stately Home (AGM)

2012 *Derek Willoughby Lecture Theatre 2 St Bartholomew's Hospital, Charterhouse Square*

Jan	David Perrett	300 Years of the Newcomen Engine
Feb	Malcolm Tucker	Ice for the Metropolis
Mar	Duncan Hawkins	Deptford Dockyard, its History & Archaeology
Apr	David Rogers	Massey Shaw – Fireboat, its History and Restoration
May	Peter Kay	The Great Eastern Railway in London (AGM)

2013 *Morris Lecture Theatre Robin Brook Centre St Bartholomew's Hospital*

Jan	Jan Spencer	Animal Power – Muscle Mills
Feb	Geoffrey Hollis	A Brief History of Timekeeping
Mar	Mary Mills	The Early History of Gas in London
Apr	Ken Catford	British 19th Century Attempts at Trade and Transport with Siberia
May	Oliver Green	The Archaeology of London Underground: a Future for its Past (AGM)

2014 *Swedenborgian Hall*

Jan	None	
Feb	Simon Davis & Greg Lahan	Medieval Mills in Greenwich
Mar	None	
Apr	Ian Bull	The Royal Arsenal Railway
May	Barrie Lejeune	The Role of the London Transport Museum and its Friends (AGM)

2015 *Horseshoe Pub (Jan), Swedenborgian Hall (Feb–May)*

Jan	Jeremy Batch	All Ship-Shape and Blackwall-Fashion
Feb	Roger Knight	London Technology, Industry and the Napoleonic Wars
Mar	Bob Redman	Elstree – Britain's Hollywood
Apr	Tony Riley	The Bricklayers Arms Branch: 1844 to closure
May	Martin Cornell	The importance of Technological Developments in the History of Brewing in London (AGM)

2016 *Swedenborgian Hall (Jan–Feb), Alan Baxter Associates (Mar–May)*

Jan	Rebecca Haslam	The Archaeology and History of the King's Cross Goods Yard
Feb	David Hilling	Father Thames – Still Alive and Kicking: The Changing Role of Thames Wharves
Mar	Michele Blagg	Gold refining in London
Apr	James Miller	The Restoration of Historic Buildings: An Engineer's Perspective
May	Simon Inglis	Played in London: The Heritage of a City at Play (AGM)

2017 *Alan Baxter Associates*

Jan	James Hulme	The Charlton Waterfront
Feb	Sue Jackson	The Spitalfields Silk Industry
Mar	Jay Carver & Andy Shelley	Crossrail Archaeology Round-up
Apr	Ian Bull	The Royal Arsenal, Then and Now
May	Andrew Smith	The New River (AGM)

2018 *Alan Baxter Associates*

Jan	Martin Adams	Conkers, Cordite and the Birth of Modern Biotechnology
Feb	David Waller	Iron Men
Mar	Victoria Owens	James Brindley in London
Apr	Douglas Rose	Underground Edwardian Tile Patterns
May	Chris Taft	Post Office Railway and Museum (AGM)

2019 *Alan Baxter Associates*

Jan	Tom Furber	Marc Brunel
Feb	Mildred Cookson	Roller Flour Mills of London
Mar	Tony Riley	London's Lost Railway Termini
Apr	Graham Dolan	Ripples in Time: The Building of Greenwich Power Station & the Unintended Consequences for the Royal Observatory
May	Richard Albanese	Trinity Buoy Wharf and the Proposed Historic Ships Collection for London (AGM)

AGM lectures
Royal Entomological Society (1995–1997 & 1999–2001), Institute of Archaeology (1998)

Apr 1995	Mary Murphy	William Mackenzie (1794–1851)
Apr 1996	Kenneth Hudson	Industrial Archaeology and the Human Imagination
Apr 1997	Bob Aspinall & Chris Elmers	The Museum in Docklands
May 1998	Alan A Jackson	The City and South London Railway
May 1999	Ron Fitzgerald	The Industrial Waterwheel
May 2000	Michael Bailey & John Glithero	The Archaeology of the Rocket
Jun 2001	Malcolm Tucker	Gasholders