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COVER PICTURE

All aboard for the Lynton-Lynmouth cliff railway (see AIA
conference report, page 4)

Photo: M Harrison

Copperas, the first major chemical industry in England

Tim Allen

From 1995 onwards, an extraordinary array of timber posts set in bright red-orange mortar was exposed by marine erosion on the Tankerton foreshore at Whitstable, Kent. In 1997, Canterbury Archaeological Trust began a two-year investigation to identify these remains. Some of the remains were identified as part of a late sixteenth/seventeenth-century copperas works, evidence of perhaps the first major chemical industry to be established in England. It later became clear that the southern copperas industry had played a prominent and previously unsuspected role in the industrialisation of the national economy from the late sixteenth to the late eighteenth centuries and that no comprehensive history for this industry had previously been compiled. Consequently, its economic importance and its complex relation with the sixteenth/seventeenth-century immigrations from the Low Country have not previously been recognised. Nor has the industry's role as the basis for the modern chemical and pharmaceutical industries received sufficient recognition. The Canterbury Archaeological Trust's work won the AIA's Fieldwork and Recording Award for 1998, as reported in IA News 107, pp8-9. A fuller report is planned for IA Review.

Copperas is a vitriol (a metal/sulphate, generally termed 'alumen' in antiquity), the production and uses of which were known to the ancients. Vitriols are described by Herodotus and Pliny and by medieval authors, with the Spanish Moor Jabir-ibn-Hayyan (AD721-815) distinguishing between green vitriol (ferrous sulphate) and blue vitriol (copper sulphate). By the fourteenth century, vitriol production was centred in Asia Minor and controlled by a Genoese syndicate. With the fall of

Constantinople to the Turks in 1453, the Genoese returned to Italy and re-established the industry at Tolfa under Papal monopoly.

The Whitstable copperas industry revolved around the production of ferrous sulphate, known as 'copperas' and 'green vitriol' but confusingly, also identified by the generic terms 'alum' and 'brimstone', the latter denoting sulphur or sulphur-rich materials. Copperas was produced from ferrous disulphide (iron pyrite), otherwise 'copperas stones' or 'gold stones'. The pyrite occurs as nodules within London Clay, an Eocene deposit ubiquitous in the Thames Basin. Copperas works therefore proliferated around the Thames estuary, especially on the Essex and north Kent coasts, where the nodules are washed out by the action of the sea. Production was also established where pyrite occurs on the coasts of Hampshire, the Isle of Wight and Dorset. In the latter case, pyrite was mined from deposits of the Bagshot and Bracklesham Beds, near Bournemouth.

Copperas was produced by a long, noxious and dangerous process involving hundreds of gallons of boiling liquid containing sulphuric acid. Evocatively, the *Kentish Gazette* reported in 1788 that: '... as John Wellard, one of the men who work at the copperas houses at Whitstable, was assisting in running the copperas ink coolers, he unfortunately slipped in up to the breast...in 24 hours a mortification ensued and in two hours after, he expired.'

The principal importance of copperas was as a dye fixative for woollens. Thus, copperas was greatly in demand as long as woollens dominated the English export trade. It was also used extensively in the embryonic chemical and pharmaceutical industries and for many other purposes (tanning, the manufacture of printer's ink, as a black dye, as sheep dip), all of which increased its value. Pyrite may have been used to produce



The Tankerton site from the south, showing copperas bed and triangularly-arranged jetty supports. Note sea beyond.

Photo: T Allen, Canterbury Archaeological Trust

sulphur for early gunpowder production in Faversham (c.1573), ten miles west of Whitstable. If so, it would probably have been produced via a method of dry distillation under heat, discovered by Christopher Saunders in 1570.

The main use of copperas in the early chemical industry was for the production of sulphuric acid and, after 1774, for chlorine and chlorine derivatives, all used in the textile industry. The demand for copperas-derived sulphuric acid grew as the Industrial Revolution increasingly 'galvanised' the economy. As Leibig famously said '...we may fairly judge of the commercial prosperity of a country from the amount of sulphuric acid it consumes.' However, in 1825, the price of Sicilian sulphur was enormously reduced, this favouring Roebuck's lead-chamber method for sulphuric acid production and dealing a death blow to the already moribund southern copperas industry. Previously, customers had been happy to pay a premium for the purer, copperas-derived sulphur.

Before the Reformation, the vitriol trade was controlled under Papal monopoly, with the market confined by the Apostolic Chamber to Antwerp, the great textile entrepôt of Northern Europe. Antwerp, as part of the Spanish Empire, was also subject to increasing economic control by the Spanish Crown, further damaging English trade interests. In response, a search for a domestic supply of copperas was initiated by Henry VIII, but this came to nothing. Only when nascent nationalism and the Reformation weakened the power of the Pope and the Spanish Crown was Elizabeth I able to attract 'certain foreign chymistes and mineral masters' by promising lucrative 'patents' to produce copperas (initial attempts to produce ammonia iron alum in Dorset were soon abandoned in favour of copperas).

Amongst the above were Cornelius De Vos, Cornelius Stevenson and Matthias Falconer, Brabanters from Liège. De Vos apparently first initiated copperas production in 1565/6 at Canford, Dorset, in association with Stevenson, who later, in 1588, founded the Whitstable work. Richard Laycolt, an associate of de Vos, left Dorset to establish an alum works at Guisborough in Yorkshire in 1603, this marking the beginning of the northern alum and copperas industry, which later overshadowed its southern counterpart.

Skulduggery and litigation was rife in the early copperas industry (De Vos himself was a rogue) and so legal documents along with contemporary descriptions simplify the task of reconstructing the manufacturing process.

Pyrite was collected from the seashore and placed in clay-lined 'shelving' timber beds, measuring about 12 feet high, 116 feet long, 15 feet broad and 12 feet deep. One of the six Whitstable works had seven such beds. Eventually, after up to four years, 'liquor', a dilute solution of hydrated ferrous sulphate and sulphuric acid, was produced, which flowed down a channel at the base of the bed into a cistern within a boiler house or, in the early period, into barrels set into the ground. One Whitstable works had three cisterns, the largest measuring 80 feet by 9 feet. The liquor was then pumped into a 12 foot square, coal-fuelled lead boiler containing 100 lbs of scrap iron.

During the subsequent 20 days of boiling, 1,500 lbs of scrap iron and further liquor was added, the latter to make up loss by evaporation.

When sufficiently concentrated, the liquor was drained into a 'cooler'. Two Tankerton coolers measured 29 feet long by 6 feet 6 inches wide. There, the solution was left for about two weeks, when the copperas began to crystallise on the cooler's inner surface (bundles of twigs were often placed in the coolers to increase the surface area). After the remaining solution was channelled into a second cooler for reprocessing, the crystallised copperas was collected, re-heated to melting point, and poured into moulds to make cakes suitable for transport in barrels.

Copperas production was a major investment requiring considerable capital outlay for plant and raw materials. Initially, Stevenson probably lacked such capital because, despite receiving the Whitstable patent in 1565, he only began production there in 1588, presumably using profits from the Canford Works. Within 50 years, another five works were established in Whitstable.

The two earliest Whitstable works, which were situated on the coastal flats, were lost to marine encroachment within 50 years. Later works were built on higher ground on and above the Tankerton Slopes overlooking the flats but the ten 'copperas' buildings shown cartographically on the Slopes in 1770 had dwindled to one by 1835.

The excavation exposed the remains of three copperas beds conforming in structure with a detailed description of 1677. Also exposed were triangularly-arranged timber-posts, probably the remains of raised jetties built in the face of marine encroachment and shown on a chart dated 1725. Stratigraphic analysis proved these to post-date two of the beds and to be contemporary with the third, providing a *terminus ante quem* for the copperas works associated with the beds. The close proximity of the works to the beds was assumed on the basis of the following descriptions:

'.. three beddes or raucks of goulde stones or sulphure stones to make coppres, that lie in a feilde wherein the workhouse now standeth, with 18 greate butts that stande in the the grounde to receyve the liquer from the goulde stones....' (1600)



Detail of shelving side of copperas bed
Photo: T Allen, Canterbury Archaeological Trust

The second description states:

'and also without and near adjoining to the said Copperas house within the said small Parcell of Land Three Bedds or Pannells made of Gold Stones, Sulphur Stones, Marquesette Copperas Stones or Stones whereof Copperas is made... ' (1745)

Other archaeological remains in the form of a rough chalk foundation and cast-iron rods were consistent with descriptions of early copperas works and provided further evidence that they had been sited on what is now the Whitstable foreshore.

In conclusion, it is claimed that the documentary and archaeological evidence examined during the above-described project provided the basis for a first, preliminary, description of the establishment, development and decline of the copperas industry in the south of England. It is therefore hoped that a foundation has now been laid for an informed discussion of the industry's wider role in the establishment of the first major chemical industry and the first industrialised economy.



Detail of mortise-and-tenon jointed bed support

Photo: T Allen, Canterbury Archaeological Trust

Newton Abbot Conference

Roger Ford

The 25th AIA conference was held at Seale Hayne College near Newton Abbot, on 4-11 September 1998. This was one of the best to date, in spite of the activities of the weather clerk, who seems to have turned against us in recent years. I am grateful to Alan Birt for additional reporting.

The seminar day, preceding the conference, was well worth travelling down for, and I think the sheer numbers of the audiences speaks volumes for Marilyn Palmer's organisation of this event. There were morning and afternoon sessions of general topics ranging from Caprington colliery in Ayrshire to the gas supply industry in Cape Town. An additional afternoon session was devoted to Cornish topics. A fuller report is given elsewhere in this issue. The standard and calibre of these papers really set the tone for the series of excellent lectures which were to follow.

Friday evening followed the traditional format of 'conference welcome', with Peter Stanier's lecture 'An introduction to the IA of Devon' giving us a foretaste of the delights to come. This was a very comprehensive discourse linking the county very much to the maritime theme. Members' contributions rounded off the evening, with exotic topics including Spain, the Dordogne and, would you believe, Albania?

Starting the Saturday morning session, Alan Stoyel and Mike Williams of the RCHME discoursed on textile mills in the South West, followed by Prof Roger Kain who took the 1841 church tithe maps as his subject. More members' contributions

followed John Alan's talk on Exeter's industries.

A choice of three Saturday afternoon visits, dogged by rain showers, took in the Haytor granite tramway of 1820 and the quarries it served; a trip by 2-8-2 tank from Paignton to Kingswear, and a ferry across to Dartmouth to see the preserved Newcomen engine, reputedly the oldest in the country and erected here as a memorial in its inventor's birthplace; and a visit to Kelly Mine and Finch Foundry. Kelly Mine ceased in 1951-2 and is now being restored by a small but enthusiastic band of volunteers. It produced micaceous haematite for anti-corrosive paint and still has Californian stamps powered by a water turbine and oil engine (installed in 1934 for dry periods). Finch foundry at Sticklepath, where all the power derives from three waterwheels fed by a leat from the River Taw, is currently curated by the National Trust. Corn and cloth mills existed on this site until 1814, when conversion to a foundry took place to make edge tools. Three successive generations of the Finch family ran it prior to closure in 1960.

In the evening delegates dried out at a sherry reception, courtesy of Plymouth University, after which followed the conference dinner. The chef really did us well, and indeed the food and accommodation were top-notch throughout.

The AGM of the AIA on the Sunday morning was followed by the awards presentations (reported in *IA News 107*), then Keith Falconer delivered the Rolt Memorial Lecture. Keith was one of only two people present in the lecture theatre to have attended the inaugural AIA conference on the Isle of Man in September 1973 - 25 years ago. He took as his theme the architectural brilliance of

Brunel, not only in the works, but also in laying out the basic plan of Swindon to give his workers a better standard of housing.

After lunch, those who were staying breezed out into torrential rain for walkabouts either in the Meldon quarry area near Okehampton or into Exeter. Exeter is a very interesting city with historical area which, of course, include the quays. Our party was lucky enough to gain entry to the fifteenth-century Tuckers Hall in Fore Street. Principal local organiser Phil Newman gave the evening lecture: 'The Dartmoor tin industry'.

There was a choice of two trips to east Devon on Monday. Both took in Coldharbour Mill at Uffculme, in rather mixed but improving weather. The steam engine, whose salvage and restoration gained the AIA Dorothea award, is now working. The mill demonstrates the techniques of wool combing, spinning and weaving. One party started the day here before moving on for a tour of Beer Quarry Caves - worked out freestone mines of very large size and complexity. The party now split into two groups. One half forayed to Colyton tannery to see leather being cured by the traditional nineteenth-century oak bark method. Here fish oils and mutton tallow are used in the conditioning process, using hand tools. The other half went on the superb 3-mile miniature Seaton-Colyton tramway, moved from Eastbourne to its present site in 1969. A depot visit enabled us to see a 1924 Exeter tram being converted to the 2ft 9ins gauge.

The alternate Monday programme started at Tiverton Museum, which features early lace-making machinery and also a range of laundry equipment - a topic rarely preserved and recorded. The museum also has a GWR 14xx 0-4-2 auto tank with its push-pull coach. Next to the Grand Western Canal, part of a scheme that never joined the



Party investigating the Haytor granite quarries

Photo: P Stanier



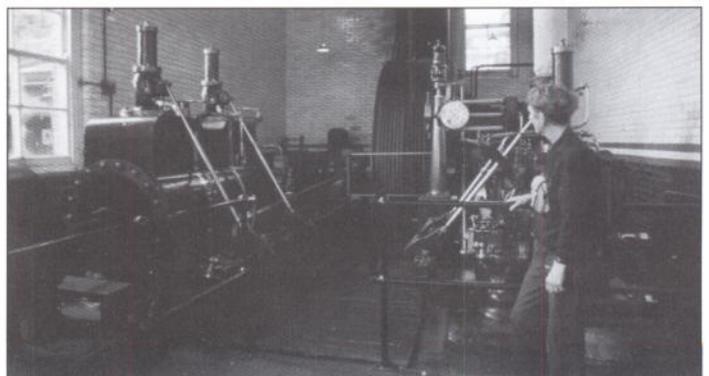
Escape from the rain in the Beer Quarry Caves

Photo: M Harrison



Coldharbour Mill at Uffculme, working steam-powered woollen mill

Photo: P Stanier



The engine room at Coldharbour Mill

Photo: M Harrison



Cherry Brook Powder Mills, Dartmoor

Photo: M Harrison



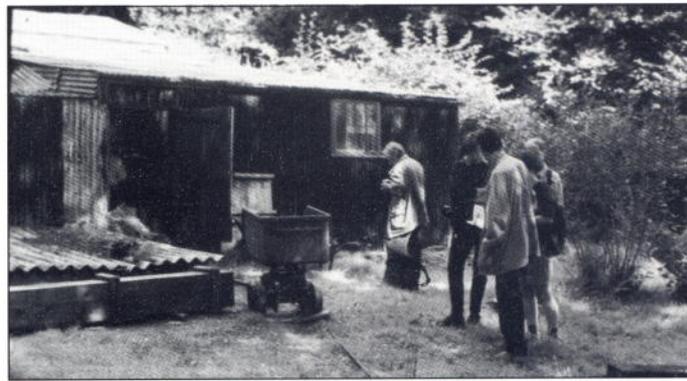
A little rain didn't prevent a visit to Exeter's iron viaduct

Photo: M Harrison



Colyton Tannery

Photo: M Harrison



Visit to Kelly Mine

Photo: M Harrison

English and Bristol Channels, where there is a lime kiln complex at the terminus and an operating horse-drawn pleasure barge. After visiting Coldharbour Mill (see above), final stopover was back in Tiverton at Heathcoat's Mill. This is still in full production for lace manufacture, and also industrial fabrics. Adjacent to the mill are terraces of industrial housing considered to be the best examples still extant in the South West.

Outstandingly good evening lectures were by Veryan Heal and Debbie Griffiths on Exmoor and Dartmoor National Parks.

Tuesday, on Exmoor, was very wet indeed. In the morning we visited Simonsbath to see a rare survivor of an estate sawmill, powered first by waterwheel, then water turbine until the 1952-3 floods overwhelmed it, finally by Ruston Hornsby diesel. The National Park authority's aim is to restore the buildings and the leat system, then repair the machinery to make gates, stiles, etc. After this feast we ascended by coach to the top of the moor to view the 650-metre long openwork known as the Roman lode. On our return to Simonsbath it was discovered the coach was too long to make the turn onto the bridge, so, having put us off, the driver had to reverse 1½ miles up a steep and twisty hill to find another route! We thus had rather a long lunch and less time to enjoy the Lynton-Lynmouth cliff railway. This, the first in the country, descends 430 feet at 1 in 7¼, by the weight of 700 gallons of water taken on at the top and discharged onto the beach at the bottom.

An alternative field trip went to the Brendon Hills, Somerset, and saw a wide range of sites associated with iron mining. Its history goes back to prehistoric times, but the big developments came in 1853 when Welsh capital bought the mining rights. Delegates were given a superb

interpretation of Raleigh's Cross Mine by guide Mike Jones. The West Somerset Mineral Railway connected with the port of Watchet. The highlight was the examination of the winding house at the top of the 1 in 4 self-acting incline, followed by the (easy) walk down and desperate struggle back!

Martin Watts was the evening speaker on 'Water-power in the South West' - well received and very topical under the circumstances!

Wednesday saw a circuit of Dartmoor, starting at Meldon quarry and limekilns in the north. The area was worked for aplite, used in enamelling and in glass manufacture, as well as for limestone. The 1870s London & South Western Railway viaduct spans the deep gorge with iron trusses. Onwards to the Wheal Betsy lead mine engine house and then the HEP station at Mary Tavy - England's largest. After a pub lunch, the afternoon was passed looking at the remains of the Shaugh Bridge china clay works, defunct since 1952, now an extremely pleasant wooded site at the junction of the rivers Meavy and Plym. The last evening lecture of the conference, 'Dartmoor gunpowder mills' by Andrew Pye, prepared us for Postbridge, one of the next day's visits.

For my money, Thursday was the best day, spent on Dartmoor. The weather was odd - heavy rain one minute, brilliant sunshine the next; often we had both together. We started at Haytor to see the amazing tramway, a national monument, constructed entirely of stone blocks. We had a pleasant amble down to the remains of Dartmoor's last working tin mines, Vitifer and Golden Dagger. On to Postbridge for lunch and to try the medieval clapper bridge before being bussed to Cherry Brook powder mills. This very big site contains the well dispersed remains of 18 buildings. Although the works closed in 1897, the proving mortar remains

by the entrance. Another scenic drive took us to Merrivale. Here is a ruined blowing house containing the best preserved tin furnace on Dartmoor, together with the mouldstone in which the ingots were cast; nearby is a prehistoric settlement with double stone rows, stone burial chamber and one of those enigmatic stone circles. In case this feast of visits was not enough, in the evening we were treated to a conducted tour around Tucker's Maltings in Newton Abbot, built in 1900 and still going strong because it is partly a working museum. Mechanisation is at a minimum, and the barley is prepared by the time-honoured traditional methods. It is licensed, and a buffet supper was served.

The last day, Friday, was also memorable thanks to our really excellent guide to Devonport, Commander Charles Crichton. After a brief stop at Smeaton's Eddystone lighthouse on Plymouth Hoe, it was down into the Barbican to embark on the m.v. *Totnes Castle*. We toured the Cattewater, then ventured out to John Rennie's breakwater, passing Drake's Island en route. Then, past Millbay Docks and up the Hamoaze, with a detailed description of the waterfront from the Royal William Yard to above the Torpoint chain ferry. After this scrutiny of Devonport we passed under the Tamar rail and road bridges, returning to land at Flagstaff Steps, close by the nuclear submarine service area. After lunch in Devonport Management Ltd's 'Sails' restaurant there was a close inspection of No.1 covered slip (shipbuilding commenced here in 1693), the gazebo on Kings Hill which affords a panorama of the dockyard scene, and the eighteenth-century ropery and associated buildings. The very last visit, to end the conference, was the Naval Base Museum. Another splendid day out, and roll on Chatham 10 September 1999!

Gasholders and the Arts

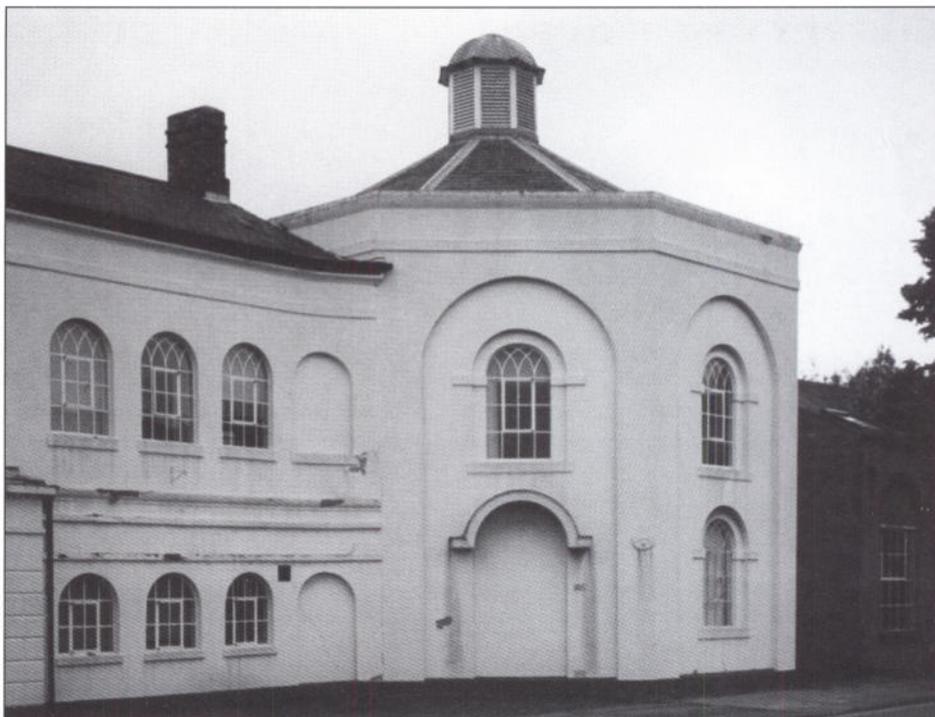
Robert Carr

Recent interest and some novel schemes for the re-use of gasholders in Britain and abroad are discussed. It is not just the industrial archaeologist who is involved.

It was the practice in the nineteenth century, especially in cold climates, to enclose water sealed low-pressure gasholders in buildings of circular or octagonal plan and a number of these have survived. Members of the AIA saw such enclosures during a visit to Poland in 1996 (see the photograph by Marilyn Palmer of Warsaw gasworks in *IA News* 99, page 7). In Vienna, there are four fine examples which are currently being adapted to a new use and others can be seen in Germany. Berlin has a gasholder house which was converted to an air-raid shelter as early as 1942.

Enclosed gasholders seem to be in the British *IA* news at present. Paul Yunnie published an article on the subject in issue 14 of *Historic Gas Times* only in March 1998. He mentions examples in North America. As well as gasholders being built in houses to prevent the water seal freezing, other factors favouring enclosure were protection from high winds and snow loading and in some aesthetically sensitive locations putting the holder in a building which could be given an elegant architectural treatment made the close proximity of a gasworks more acceptable to local residents. In the USA in the 1980s, the Society for Industrial Archeology carried out a survey and in New England found 13 surviving gasholder houses all in good condition. The example at Concord in New Hampshire still contained its holder in 1988 and was thought to be the last complete gasholder house surviving in the US. Inside the building was a single-lift holder of 125,000 cu ft capacity guided by rails fixed to the inside walls. The enclosing house built in 1888 was 86 feet in diameter and 24 feet high. A fine photograph is reproduced in Paul's article. The building has a strong chapel-like appearance.

In this country there was an enclosed stone-built gasholder house at Gott's Mill, Armlay, now Leeds Industrial Museum, and two small examples, without their holders, survive in Warwick (SP 278653). They were built in 1822. Sir Neil Cossons reproduces a photograph of the Warwick gasworks in the second edition of his *BP Book of Industrial Archaeology*. The gasworks in Warwick were in the western part of the town, on the north side of Salfisford, by the terminus of the Warwick and Birmingham canal which would have been convenient for the delivery of coal. Now converted for office use, they lay claim to be the oldest-known surviving gasworks buildings. Early gasholders were often placed inside buildings in the mistaken belief that this was safer. However, a consideration of explosions and the effect of flying bricks led to an end to this practice. Photographic evidence makes clear that many gasholder houses had windows. In the event of an explosion flying glass



Fine architecture: Warwick gasworks' south enclosed gas holder house of 1822

Photo: R J M Carr

would have been an additional hazard.

Brian Sturt in *GLIAS Newsletter 175* mentions contemplating the inside of a gasholder in comfort from within the Royal Albert Hall, South Kensington, itself sometimes compared with a gas storage building (some of the German examples look remarkably similar) and remarks that in the days of the South Metropolitan Gas Company anything like entertainment inside gasholders was sadly lacking. In our own more enlightened times this is no longer the case and it is probably in Germany that innovation commenced. Readers will probably be familiar with the use of abandoned industrial buildings for installation art. The Anya Gallaccio *Intensities and Surfaces* installation at the London Hydraulic Power Wapping pumping station in 1996 will be well known to many (see, e.g. *Times* 17 & 20 February, 1996) and during the period of LDDC occupancy at Trinity Buoy Wharf near the mouth of Bow Creek the site was notable for installation art. As well as 'Pitch' (see *IA News* 102, page 9) there was also an exhibition here previously of lengths of plain cloth which had been left for a time in some of London's Lost Rivers so as to gain a little of the character of the water which flowed in them.

A development in music is the writing of compositions which are 'site specific'. You may remember a series of TV programmes with young musicians performing such works in a disused London roller flour mill and other interiors with a strong industrial ambience. As a contribution to the 1995 ISCM World Music Days the composer James Clarke wrote and had performed a 'site specific' seven minute 'surround-sound' piece 'Afterglow' for four musicians to be performed inside the 525 feet high disused cylindrical gasholder at Oberhausen in the Ruhrgebiet, Germany. This gasholder, which would have been of the dry type, now functions as a museum and exhibition space and its vertigo-inducing interior

made it a spectacular venue for timbral and spatial musical presentations. A concert performance of 'Afterglow' took place recently at the Conway Hall in London but here without the contribution of the Oberhausen gasholder additional parts had to be written out for violin and piano to approximate the effect.

Site-specific musical events took place this April in Manchester. Joseph Hyde produced a piece 'Resonating Arch' for the Castlefield railway viaduct, in which the sound of trains passing overhead was electronically manipulated. While the provision of funding for artistic endeavour is to be applauded, readers of *IA News* may hope that funding for the recording of industrial buildings and structures and the setting up of industrial museums where appropriate will also be forthcoming. Dr Ray Riley, in his paper on industrial archaeological recording in the Upper Silesian coalfield (*IA News* 105), raises important issues concerning the low status of technical or engineering culture which is certainly not confined to Poland. Here in the current atmosphere of 'Cool Britannia' we may fare as badly when competing for financial support against avant-garde arts projects which to fund providers might seem far more relevant and forward-looking than reminding the general public what old-fashioned British industry used to be like. Industrial archaeologists are all too likely to be branded as dinosaurs. The London Hydraulic Power Station at Wapping will probably become a venue for a women's theatre group and certainly never a museum of hydraulic power. Some of us who visited the Anya Gallaccio installation there did so not only to see the ice but also to be able to photograph the interior of the pumping station. At least photography was freely permitted.

Thanks are due to Axel Föhl for information on German gasholders.

Current research and thinking in industrial archaeology

Marilyn Palmer and Peter Neaverson

Now a regular part of the AIA annual conference, last year's seminar, held at Seale-Hayne campus at Newton Abbot on 4 September, was the first to need parallel sessions to accommodate the number of papers offered. These drew a high attendance and provoked lively discussion. The morning and one of the afternoon sessions were devoted to general topics, while the second afternoon session dealt specifically with research and recording in south-west England.

The English Royal Commission has been heavily involved in recording projects in the south-west. During the conference, Alan Stoyel and Mike Williams described their research and survey on textile mills, demonstrating the former importance of various textile industries in the local economy as well as throwing new light on the continuity of the domestic textile industry. Alan Stoyel also gave a seminar paper on process recording at South Crofty prior to its closure in March 1998, thereby ending the long tradition of metal-mining in Cornwall: by that time it was the last tin mine in Europe. Diverting from the traditional Commission approach, it was decided to produce a process record of the sequential operations involved in the mining and dressing of tin ore. Photographs and notes were taken of the whole operation, from the underground drilling of the ore to the sampling of the tin concentrate before it left for the smelter.

The National Trust and the Cornwall Archaeological Unit have also been carrying out a great deal of industrial archaeology in Cornwall. Alan Davey from the National Trust gave an account of the acquisition by the Trust of a four-mile stretch of coastline at St. Just and the

subsequent landscape conservation works, with particular emphasis on the consolidation of the numerous mining remains located in the area. Peter Herring described a recent pilot study carried out by Cornwall Archaeological Unit for the Countryside Commission and English Heritage to establish a method of mapping and describing the historic character of the whole county. In addition to mapping historic landscape character, types and zones defined by either active or relict industry (Redruth-Camborne mining or St. Austell china-clay areas), the mapping also recorded agricultural land which has been significantly altered by the establishment in the eighteenth and nineteenth centuries of new farms, small-holdings and cottages, often taken in from former downland. This characterisation allows better informed strategies of landscape management to be devised and development control to be more sensitively monitored.

Bill Newby represented the Trevithick Trust which is concerned with the promotion of historic Cornwall and its industrial heritage. He described the sites managed by the Trust in Cornwall, which include the Cornish Engines at Pool, Geevor Tin Mine, the Porthcurno Museum of Submarine Telegraphy, the Levant Mine, Pendeen Lighthouse and Tolgus Tin, the latter now part of Cornish Goldsmiths at Portreath. Charles Thurlow of the Trevithick Society dealt with the china clay industry, discussing in particular the mica clays, which were low grade china clays largely produced from residues left after the refining of china clay had taken place. There were scores of mica clay works in the St. Austell district and he illustrated some of the remains in the area together with features of individual workings.

For the general topics, John Crompton opened

the seminar with a paper concerning the interpretation of the Newcomen engine at Caprington, Ayrshire, then being reconstructed in the new Museum of Scotland. As the last atmospheric engine to work in Scotland, it was described in *The Engineer* in 1898 but subsequent research into previously unconsulted colliery records has enabled him to piece together an alternative history. Colm Donnelly described the excavation and restoration of Mullycovet Mill, Belcoo, Co. Fermanagh, Northern Ireland. This abandoned nineteenth-century rural industrial complex consists of a water-powered corn mill, a grain-drying kiln, the former miller's house and farmyard, a mill shop, an orchard and a mill pond. Driven by a vertical timber waterwheel, the corn mill had a single pair of stones powered by simple wooden cog-and-rung gearing. The restoration process involved an archaeological excavation of the mill and kiln.

Two papers were concerned with gas works. John Horne described his detailed research into gasworks for country gentlemen. Well-to-do Victorians wanted the comforts of town life within their country retreats and, if there was no nearby gas supply, many had a small gasworks built within their grounds. The technology at first miniaturised that of the mainstream gas industry but the advent of cheap calcium carbide and better oil refining standards allowed the use of other gases. A visitor from South Africa, David Worth, talked about the gas supply industry in Cape Town and its role in the formation of an industrial landscape. His paper focused on the way in which the provision of public street lighting by gas became a moral and political battleground, utilising representations by contemporary commentators and graphic artists. The commercial supply of coal gas in Cape Town dates to 1845 but the Woodstock gas works, opened in 1888, remained in production until their closure and demolition in 1996.

David Bick, well-known for his research on engine houses, presented an illustrated paper on those for pre-Cornish type beam engines. Using documentary sources and field evidence, he discussed their evolution until the Cornish engine gained precedence around 1830 and showed how the design of the engine influenced the building itself. Finally, Anthony Streeten from English Heritage discussed the results of their recent survey into public access to England's industrial heritage. This had examined more than 500 preserved and publicly accessible sites across the country. He considered the ways in which English Heritage and other agencies might open more doors to the future public appreciation of these places.

The next seminar on 10 September 1999, part of the annual conference based at Chatham in Kent, will be organised by the Greater London Industrial Archaeology Society. Offers of papers should be made to Tim Smith, 30 Gaveston Drive, Berkhamsted, Herts HP4 1JF.



North Tawton mill in Devon, one of many textile sites in the South West recorded by the English Royal Commission
Photo: RCHME © Crown Copyright

New members

The AIA welcomes the following new institutional and affiliated society members:

- Dipartimento Discipline Storic, Bologna, Italy
- National Trust Industrial Projects, Llandeilo
- Newcastle Discovery Museum, Newcastle upon Tyne
- Planning & EPA Library, Melbourne, Australia
- Railway & Canal Historical Society, Oxford
- Robert Stephenson Trust, Newcastle upon Tyne

Robert Stephenson Trust

Recently affiliated to the AIA is the Robert Stephenson Trust, a registered charity which aims to restore the original engine works at 20 South Street, Newcastle upon Tyne, as a means of recognising the true role of Stephenson as a locomotive and civil engineering pioneer. Robert Stephenson was the co-founder and working manager of the world's first purpose-built locomotive factory established in 1823 at South Street, and later known as the Forth Street Works. It was here that *Locomotive No.1*, the *Rocket* and *Planet* were built to his designs. In 1828-30, he developed an economically viable prototype which remained the basis for all future steam locomotive development. Robert Stephenson &

Company exported locomotives first to France and the USA and then all over the world. The legacy of his civil engineering genius remains with the High Level Bridge across the Tyne, the Royal Border Bridge across the Tyne and the Conwy tubular bridge.

Some work has already begun on the major renovation of the Grade II* listed building, but funds are urgently needed. For details, contact Robert W. Rennison, Robert Stephenson Trust, 147 Edgehill, Darras Hall, Ponteland, Newcastle upon Tyne NE20 9JT.

Internet news

Well, is there? I am seeking someone who can dredge up any sort of IA items which are appearing across the world wide web and which may be of interest to our readers, with the aim of submitting a regular column. Please contact me if you are interested.

Editor

CONFERENCES AND CALLS FOR PAPERS

The first two items were received too late for the last issue of *IA News*, but there may be time to submit proposals for papers.

Savannah conference

The Society for Industrial Archaeology (SIA) is holding its 28th annual conference on 3-6 June 1999 in Savannah, Georgia, and invites

proposals for papers to be read at the meeting. Presentations on all topics are welcome, while presentations with a southern focus on maritime archaeology and Ante-bellum/New South industrialisation (including military history, agriculture, and industrial slavery) are encouraged. Landscape studies are of particular interest.

As proposals are due by 15 February 1999, please contact immediately Jack R. Bergstresser, SIA Program Committee, Department of Anthropology, 338 Ullman Bldg., University of Alabama at Birmingham, Birmingham AL 35294, ☎ (205) 934-4690, Fax: (205) 934-9896, e-mail: drblast@email.msn.com.

Gdansk engineering heritage

International Conference Preservation of the Engineering Heritage - Gdansk Outlook 2000, 7-10 September 1999. Offers of papers were due by 31 December 1998, but try contacting Waldemar Affelt, who speaks excellent English, on e-mail at: affew@pg.gda.pl. Full address is on the Diary page.

History of electrical engineering

History of electrical engineering weekend, 9-11 July 1999. Papers are invited on all aspects of the history of electrical engineering. Topics

range from current electrical engineering subjects to those of a biographical or general nature. Contributions relating to electrical engineers or companies in the local area are particularly welcome. Abstracts on one side of A4 to be submitted by 5 March 1999 to Dr John Beavis, School of Conservation Sciences, Bournemouth University, Talbot Campus, Poole, BH12 5BB, Fax: 01202 595255, e-mail: jbeavis@bournemouth.ac.uk

AIA pre-conference seminar

This year's seminar will be on 10 September 1999, at Chatham in Kent. Offers of papers should be made to Tim Smith, 30 Gaveston Drive, Berkhamsted, Herts HP4 1JF.

International NAMHO 2000

The first international conference of the National Association of Mining History Organisations, and their 21st annual national event, is being hosted by Carn Brea Mining Society and Camborne School of Mines in Cornwall, on 14-18 July 2000. The organisers are keen to contact international speakers for this prestigious conference. Anyone interested, or who has contacts with possible overseas speakers, should contact Maureen Holmes, Carn Brea Mining Society, Rivergarth, Bar Meadows, Malpas, Truro, TR1 1SS, or e-mail: NAMHO@csm.ex.ac.uk

ADVERTISE IN IA NEWS

IA News reaches a wide readership through direct subscriptions, circulation to affiliated organisations and use in libraries.

The market reached will be attractive to publishers, tour operators, heritage consultants and visitor attractions.

Advertising rates range from as little as £30 to £170 for a full page.

All proceeds contribute to the costs of the Newsletter and the work of the Association which is a Registered charity. Inserts may be mailed with *IA News* at a charge of £25.

For further details, contact the Editor.

AIA

Association for Industrial Archaeology

Announcing the three Fieldwork and Recording Awards for 1999

The AIA Fieldwork Award scheme exists to encourage recording of the physical remains of the industrial period to high archaeological standards. The awards are open to both amateur and professional field workers, and have been operating successfully for many years.

Work submitted may already have been published or, if not, may be encouraged to publish. As well as the main award there is also the Initiative Award for innovative projects, e.g. those from local societies; and to encourage the future industrial archaeologists, a Student Category.

THE CLOSING DATE FOR ENTRIES IS 1st MAY 1999

Successful Entries will be notified in August

The successful authors will be invited to attend the AIA annual conference in Kent to collect their awards in September 1999

Entries should be sent to:

Shane Gould, Archaeological Advisory Group, Planning Essex County Council, County Hall, Chelmsford, Essex CM1 1LF

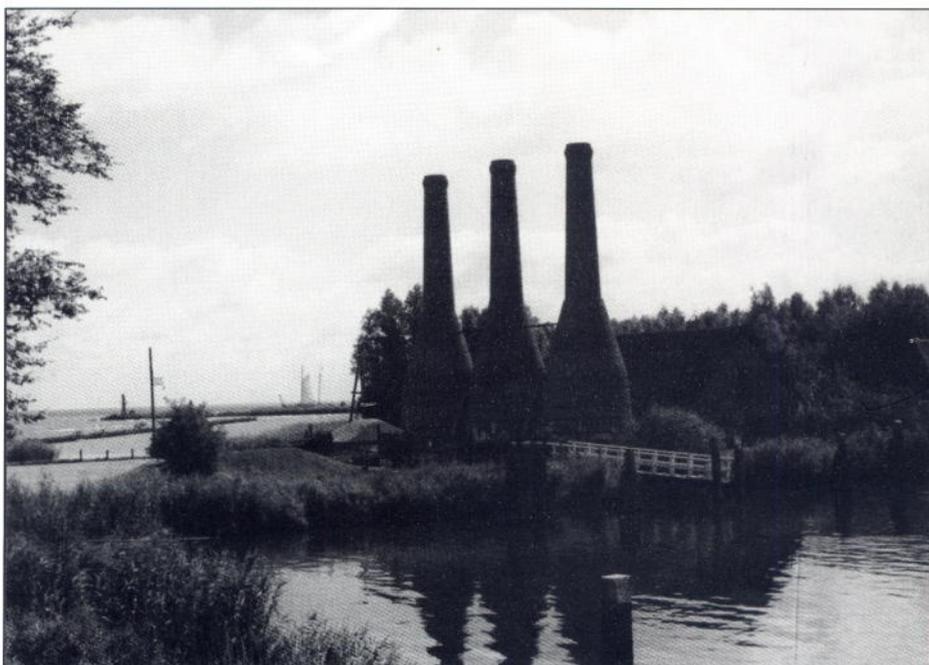
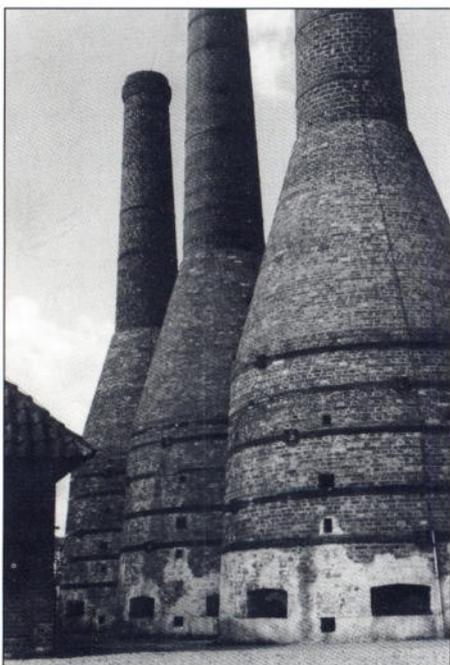
FURTHER DETAILS WILL ALSO BE AVAILABLE FROM THE ABOVE ADDRESS

Shell lime ovens at the Zuiderzee Museum

These three striking limekilns can be seen at the Zuiderzee Museum at Enkhuisen on the west shore of the IJsselmeer, Netherlands. After the Afsluitdijk (Barrier Dam) in 1932 changed for ever the maritime cultures around the Zuiderzee, crafts and domestic buildings were brought to Enkhuisen and re-erected to form an excellent open air museum which opened in 1983.

Limekilns were once common around the shores of the Zuiderzee, burning sea shells with coal dust to provide lime for the building industry. There were four kilns at Akersloot where the Ruigewaard family employed eight lime-burners and two bargemen, but this was a labour intensive industry which ceased in 1976. Two years later, three of the kilns were dismantled and rebuilt at the museum, where they are a prominent feature. Burnt shell lime was shovelled out by hand and slaked in a slaking shed. The shed alongside the kilns at the museum was brought here from Hasselt after it closed in 1981.

Photographs: Peter Stanier



'Whither Industrial Archeology?'

The Society for Industrial Archeology (SIA), together with the Historic American Engineering Record (HAER) and Lowell National Historical Park in Massachusetts organised in November 1998 an ambitious symposium on the future directions of industrial archaeology in North America. They invited six speakers from Europe to join their American colleagues: Marie Nisser from Sweden, Louis Bergeron, the TICCIH President from France, and Eusebi Casanellas, the TICCIH Executive President from Spain, together with Henry Cleere from ICOMOS, Barrie Trinder from Nene University College and myself from the University of Leicester.

The first session reflected on the development of the discipline as well as providing an entertaining look into the future from Matthew Roth entitled 'Who will love the Alameda Corridor', highlighting the future problems of industrial conservation in such areas as the suburbs of Los Angeles. The themes of the second session were compliance, mitigation and design, dealing with the respective roles of the federal government, state government and the private sector in the recording and conservation of industrial sites. The representatives from Canada saddened the audience with their tales of declining funding and lack of enthusiasm by Parks Canada, in contrast to the long-standing support provided by the National Park Service in the USA. The session on interpretation in industrial archaeology included viewpoints from America, Great Britain (Barrie Trinder) and Spain (Eusebi Casanellas): Robert Gordon from Yale University emphasised the importance of artefacts in industrial archaeology, while Donald Hardesty from the University of Reno in Nevada spoke of 'the multiple voices of fieldwork': both these speakers referred to the importance of the cultural context of both sites and structures, an aspect often neglected by HAER recorders.

The session on education in industrial archaeology ranged widely, from Patrick Martin's survey of the graduate program in industrial archaeology at Michigan Technological University through my own discussion of the conflict of objectives in training industrial archaeologists (heritage managers or

archaeologists?) to Henry Cleere's analysis of the World Heritage Convention as a medium for promoting the industrial heritage, largely through the designation of World Heritage Sites. The final session proved the most innovative, as befitted its title of 'New Directions', including papers on labour studies, gender and ethnic studies and experimental archaeology, the latter by Patrick Malone of Brown University. Fredric Quivik, who bore much of the burden of the organisation of the symposium, contributed a stimulating paper on lessons from environmental history, concentrating on the landscapes contaminated by copper smelting around Butte in Montana.

The splendid surviving textile mills, canal system and associated industrial housing of Lowell has provided an appropriate setting for many industrial history conferences since it became a National Historical Park in 1978. 'Whither Industrial Archeology?' clarified the role of the discipline in North America, enabled some contrasts and comparisons to be made with Europe and pointed to some new directions, particularly the cultural context and human experience associated with the processes of industrialisation. SIA are to be congratulated on their initiative and the published papers are eagerly awaited.

Marilyn Palmer

The Industrial Trust launched

The National Trust has departed from its normal concerns with stately homes and landscapes with the sponsoring of The Industrial Trust, a body whose aim is to present and promote industrial and manufacturing endeavour of yesterday, today and tomorrow through the provision of public access to live industry. This follows on from a Members' Resolution at the 1996 AGM of the National Trust which wishes to draw the attention of Council to the importance of Trust properties of scientific, engineering and technological interest especially in and around population centres and to encourage Council by means of improved displays, exhibits, models and where appropriate, visitor centres, to provide enhanced opportunities for interest and study particularly for stimulating the imagination

of young people towards a better appreciation of the importance of these subjects in the economic and cultural life of the nation, and to consider favourably the acquisition of further properties in this field.

The Industrial Trust intends to act as a catalyst in bringing together partners from industry wishing to develop the educational potential of allowing people to experience at first hand dynamic industrial processes and technology. The Trust's first partnerships have been with Tower Colliery and Port Talbot steelworks in South Wales but it has now joined with the South Yorkshire Industrial Project to develop similar activities in the Sheffield area.

The Trust was launched at a seminar called 'Industry Matters', at which both local industrialists and national figures such as Will Hutton of *The Observer* and Alec Daly, chairman of the CBI's National Manufacturing Council spoke. The sessions were chaired by Charles Nunneley, Chairman of the National Trust, and Timothy Mason, Director of the Museums and Galleries Commission. The *Industrial Archaeology Review* editors were present as members of the Industrial Archaeology Liaison Group of the National Trust, which is chaired by one of our Honorary Vice Presidents, Professor Angus Buchanan. AIA Council endorses this imaginative initiative by the National Trust.

Marilyn Palmer
and Peter Neaverson

UNESCO World Heritage Sites

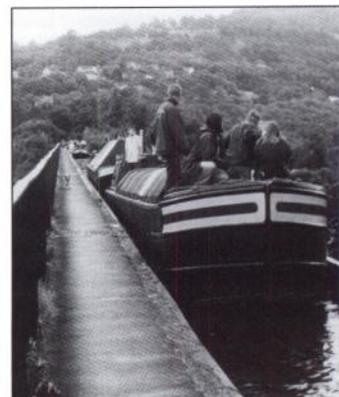
The Secretary of State for Culture, Media and Sport has issued a consultation paper on a new United Kingdom Tentative List of future inscriptions to World Heritage Site status during the period 1998-2007. The sites must be of 'outstanding universal value' and stringent criteria must be met to establish this. Sites are classed as 'cultural' and 'natural' with specific reference to cultural landscapes. Apart from these formal criteria, the World Heritage Committee of UNESCO has been concerned in recent years over the imbalance between the number of sites in Europe and North America and the number in other regions of the world, and an apparent domination of western cultural values. The Committee has also been concerned by the preponderance of

cultural sites over natural ones.

Some 32 recommendations for inclusion on the Tentative List have been made by experts convened by English Heritage. These include four Natural Sites and the remainder are Cultural Sites. These include the cultural landscape of the Lake District of Cumbria. Specific industrial sites include the following:

Blaenavon Industrial Landscape,
Torfaen, South Wales
The Cornish Mining Industry
Dallas Dhu Distillery, Murray,
Scotland
The Derwent Valley, Derbyshire
The Forth Rail Bridge, Scotland
The Ancoats, Castlefields and
Worsley areas of Manchester
and Salford
New Lanark, Scotland
The Great Western Railway from
Paddington to Bristol
Pontcysyllte Aqueduct, Wrexham,
Wales
Chatham Naval Base, Kent
Liverpool Commercial Centre and
Waterfront

Before final decisions are taken on the content of the Tentative List, the Department sought the views, in particular, of the owners, managers and of those who live and work in and near the proposed sites, as well as of the wider community. The Department sought comments on the significance of the sites proposed and also on the practical implications of inclusion in the List.



Boaters enjoy a crossing of the famous Pontcysyllte Aqueduct, one of several industrial sites in possible line for World Heritage status

Photo: Peter Stanier

Welsh industrial museum

Latest reports indicate that Cardiff's Welsh Industrial Museum, the closure of which was reported in *IANews 106*, is to be moved to a site in Swansea.

Here for the beer

An attendance of over 100 confirmed the popularity of beer at the 56th East Midlands IA Conference held last October at the Bass Museum in Burton on Trent (which is technically in the West Midlands by one mile).

Dr Alannah Tomkins, who is currently working on the economic history of Burton on Trent volume of the *Victoria County History*, outlined the development of the brewing industry in Burton from 1700 to 1822. This was controlled by the development of the Trent Navigation and the state of the Baltic trade. Beer was frequently shipped to the Baltic ports via Kingston upon Hull, as back cargo against imports of iron and timber. In the late eighteenth century, major names like Bass, Worthington and Alsop began to emerge as dominant forces. Many of the smaller brewers failed when Napoleon blockaded the Baltic Ports in 1807. The major turning point for the larger breweries' export markets came when they moved from brewing beer of a type similar to nut brown to the development of India Pale Ales.

Cliff Shepherd spoke on the expansion of Burton in the railway age. This began with the opening of the Birmingham & Derby Junction Railway in 1839 and reached its zenith when it was served by four of the pre-grouping companies. Of the 34 breweries that were operated in the 1870s, Bass and Alsop's on their own were shipping over 1.7 million barrels a year by rail. In the 1890s the level of beer production was swollen even more by London brewers opening breweries in Burton, such as Inde Coope, Charringtons, Trumans Hanbury and Buxton, Mann Crossman and Walkers. By 1914 the number of brewery companies had dropped to 16 through closure, take over and rationalisation. From 1857 the brewers developed their own railway networks to carry the traffic of barley, malt, timber, coal, empty casks, clean casks, bottles, hops, spent grain and all the other components of beer. The development of a dense urban rail system produced a multiplicity of level crossings of which 29 were still in use in 1962 - Burton became infamous for its traffic delays. The private railway system saw major closures from 1967 onwards and is now only a memory.

John Bonnett spoke of the remains of the Victorian heritage of Burton and set the brewing industry

in a broader national perspective. Despite huge demolition over the last 30 years, much of interest remains. The brewing industry in Burton was served by the exceptional quality of the local water drawn from the gypsum beds, the presence of the South Derbyshire coalfield within three miles and the transport network. It also consumed huge quantities of bricks and timber. Coal consumption was in excess of 100,000 tons per annum at the peak of brewing activity. The peak of British beer consumption was reached in 1900 at 35 gallons per head per annum (visitors to AIA conferences might doubt the veracity of this figure!).

In the afternoon there was time to inspect the displays in the Bass Museum. Some of the remaining historic sites related to brewing were visited by vintage Daimler double deck bus and on foot. Visits were also arranged to Clay Mills sewage pumping station on the outskirts of Burton. Clay Mills was built in 1885 to cope with the vast quantity of effluent produced by the breweries. It contained four Woolf compound beam engines by Gimsons of Leicester and a plethora of ancillary plant. The early electricity generating plant and the workshops are particularly interesting. The site is in the process of being renovated from a semi-derelict condition and is well worth a visit.

Mark Sissons

MPP: limeworks in Surrey

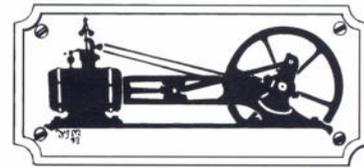
The Monuments Protection Programme, operated by English Heritage, has as an aim the evaluation and selection of industrial monuments for statutory protection. It is recognised that industrial sites and structures, of great inherent interest and 'heritage' value, are badly under-represented among Statutory Scheduled Ancient monuments. Some 30-50 classes of industrial sites and structures are being considered by various organisations under contract to English Heritage, the earliest being the lead, coal, alum, brass and gunpowder industries, along with ice-houses and dove farming.

Each industry, or group of industries, goes through a six-step process, commencing with consultation with identified individuals 'known to have information and expertise', and the

circulation of a preliminary account of the industry for comment. A Step 3 report is likewise circulated for consultation, and the exercise culminates in 'recommendations for protective action' for selected sites. The 'Lime, cement and plaster industries' have now reached the Step 3 report stage, listing and grading identified sites. Over 150 limeworks sites have been considered and graded, throughout England, and these include seven sites in Surrey at Puttenham limekiln, Guildford, Busbridge, Guildford Castle, Deerleap Wood, Brockham chalk pits and lime works, Betchworth-Dorking Greystone Lime Co Works and Oxted chalk pits.

In the light of this belated recognition of the historical importance of the limeworks at Betchworth, Brockham and Oxted, it is unfortunate that industrial landscapes and structures at all three sites were not afforded greater protection or even care 20 years ago, when their value was beginning to be appreciated. Much of the Brockham site was purchased by Surrey County Council, although

sadly the important patent 'Brockham' kilns have continued to collapse. Much of an impressive industrial landscape at Betchworth has been destroyed by landfill operations (likewise at Oxted), leaving only the kilns. Betchworth was noteworthy in having an early (1920s) hydrating plant and a modern (1950s) successor. Sadly, since the 1960s, both have been taken by the scrap iron merchants. An enormous and impressive hydrator plant at Oxted has recently suffered the same fate. Other essential elements of a traditional limeworks, such as screens, have also gone. Likewise, the impressive gravity-worked incline at Betchworth (featured in Clarence Winchester's *Railway Wonders of the World!*) and, earlier, the Ropeways Syndicate's aerial ropeway at the same site ... even the surviving (albeit collapsed) winding gear at the pit, has now gone. So, at yet three more limeworks we are left with nothing but the kilns, albeit in these three Surrey examples exceptionally important survivals from the second half of the nineteenth century - the Dietzsch and Smidth kilns are



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examples of 'transferred technology' having originally been developed in mainland Europe as vertical cement-burning kilns.

One ray of hope, additional to the English Heritage MPP recognition, is the availability of substantial funds (derived from landfill tax payments) for conservation work. The Surrey Wildlife Trust, the Surrey Industrial History Group, local authority representatives, and others, were represented at a site meeting at Betchworth recently to consider proposals for conservation work on the surviving structures, both at Betchworth and at Brockham.

Paul Sowan

Progress at Cruquius

Work by volunteers is progressing at the famous Cruquius steam engine, near Haarlem, Netherlands. The massive 144-inch diameter cylinder was cast by Harveys of Hayle, Cornwall, the largest beam engine ever made. The round engine house is castellated and has pointed arches. Eight beams (made in Amsterdam) emerge, formerly operated by the great engine and each able to lift 8,000 litres of water 5 metres per stroke.

Three pumping stations were built to drain the Haarlemmer Meer, which was achieved in 1849-52. Thereafter, the engines continued to keep the waters under control. The Leeghwater and Lynden pumping stations were modernised so only the Cruquius pumping engine now remains, having been kept on standby until 1933 when it closed. A small group of enthusiasts saved the

engine, although the boilers were scrapped. The boiler house now contains a museum.

Volunteers are hard at work to restore the engine to motion, worked by external hydraulic cylinders as steaming will not be possible. It is hoped that this will be ready by 2002, on the 150th anniversary of the draining of Haarlemmer Meer. Some movement should be possible even earlier. Readers are recommended to visit this fascinating site if in the area. It is but a few miles from Amsterdam.

National Heritage Corridor

The Derwent Valley Trust is active in promoting the National Heritage Corridor, the name given to the Derwent Valley in Derbyshire. The Derwent Valley is among the sites suggested for World Heritage Site status. The River Derwent has been the site of early industrialisation, powering several generations of pioneer textile mills. The first was the water-powered silk mill in Derby in 1704, followed by Richard Arkwright's cotton mill at Cromford (1771), where there are also examples of early workers' houses. Twenty more mills followed and substantial remains survive. North Mill, Belper (1804) and annexes to the Long Mill at Darley Abbey (c.1808) are fine survivals of early fireproof mills.

Opening up the valley for recreation, leisure and education, projects include the Derwent Valley Cycleway, with a study underway by the national cycling organisation Sustrans, to consider a route or series of routes along a 22-mile length from Little Eaton to Bakewell. The Derwent Valley Trust has identified and evaluated an unbroken footpath enabling the whole valley to be walked for nearly 60 miles, from Shardlow in the south to Ladybower reservoir in the north.

Enabling works

With reference to 'Station Archaeology' in *IA News 106*, page 10, a significant point about the redevelopment which is planned to take place to the north of St Pancras railway station is that quite apart from what is to be eventually replaced, considerably more room will be cleared for civil engineering enabling works. These enabling works are preliminary activities which are to make room for the main work

itself. The situation is a little like having to rearrange the furniture in a crowded room at home. It is made so much easier if some furniture can be put in the passage outside or in an adjoining room first. To the north of St Pancras more of the listed items could be retained but for the ground they occupy being needed temporarily by the contractors. The redevelopment could be done differently using less space but it would then cost more.

This situation with respect to 'enabling works' is a general one and will crop up in most redevelopment schemes. It is not peculiar to St Pancras.

Robert Carr

The Rupe Museum, Dubrovnik

Croatia's historic city of Dubrovnik and the coast and islands to the north and south were the independent republic of Ragusa from the Middle Ages until it was abolished by Napoleon in 1808. It made its wealth by sea trade, and was second only to Venice as a commercial centre in the eastern Mediterranean. Its name gave us the word 'argosy' for a large merchant ship. It has a rich heritage of religious and commercial buildings, on a planned grid pattern and completely surrounded by city walls. It is now a World Heritage Site and the damage caused by Serbian shelling in 1991 has almost all been repaired.

The coast is mountainous and stony and it was not easy to supply Ragusa with water and food. The water supply was assured by a Neapolitan, Onofrio della Cava, who built a 12-km aqueduct in 1438 from springs at Sumet. This fed a number of private supplies and mills, and two public tanks or 'fountains' which survive.

Wine, olives, fish and other food could be produced in the republic, but wheat was another matter. It was brought in from all over the eastern Mediterranean but particularly from southern Italy and the present Albania. This trade was so important that the city authorities developed a policy of keeping large reserves of grain in storehouses in case of siege, wars, crop failures or commercial disputes.

A number of storehouses stood around the city, but by the mid-sixteenth century it was decided to build a new storehouse which would

help to house much larger reserves. This store, the Rupe (from the Italian word for 'rock'), was built in 1548-90 and still stands in the alley 'od Rupa', high in the northern corner of the walled city. It is a fascinating example of a large functioning building designed for bulk storage and handling before the Industrial Revolution.

The Rupe was originally of four storeys, but one was removed in the nineteenth century. The walls are of local limestone but inside there is massive brick vaulting to support the loads. The ground floor is of 5x3 bays, with two lines each of four huge pillars. Fifteen separate pits, one beneath each bay, were dug deep into the rock for additional storage. At the top of each pit is a hole in the floor, closed by a removable stone with an iron ring. There are chutes in the walls to bring grain from the upper floors, and holes in those floors corresponding to the holes above the pits. I imagine that grain was brought into the upper floors at the back, taking advantage of the slope, and there may have been hoists with pulleys.

The ground and first floors are open on weekdays from 9am to 1pm at a charge of 5 kuna (about 50p). The ground floor has a small display about the building, including drawings. It is in Croatian, but we were lent a leaflet in English; regrettably this was not on sale. Most of the floor is kept clear so that visitors can appreciate the construction. One of the pits is kept open and lit to show its size and depth.

The first floor has a small but excellent display of objects and superb photographs about agriculture, rural life and traditional crafts. It is captioned only in Croatian but most of it is self-explanatory.

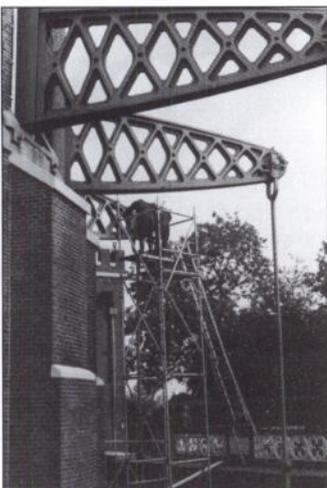
Derek Bayliss

IA posters wanted

A new museum opening in Duisberg, Germany, is seeking to display a large number of industrial archaeological posters. If any reader has any available, could they please send them to Dr Hans Kania, Bauhütte Zeche Zollverein, Gelsenkitchener Strasse 181, 45309 Essen, Germany.

Irish mill seminar

To commemorate the restoration of Mullycovet Mill, a seminar entitled 'Irish Mills and Milling' is to be held at Enniskillen College of Agriculture,



Volunteers working one of the beams at Cruquius in July 1998

Photo: Peter Stanier

County Fermanagh, on 7 May 1999. Lecturers include Gavin Bowie, Nick Brannon, Michael Coulter, Bill Crawford, Margaret Gallagher, Fred Hamond, Mark McCloskey, Megan McManus and Colin Rynne. The address of the organiser, Dr Colm Donnelly, can be found on the Diary page.

Winding engine saved

Heritage Engineering have made a last-minute rescue of the electric winding engine at Francis Colliery. It

was transported to the Scottish Mining Museum, where it is hoped to be re-erected sometime in the future. The engine, by Robey's of Lincoln, is representative of the great post-war expansion of the Scottish coalfield. The Francis Mine site is to be cleared.

Proud perforators

Last year the Cornish firm of J. & F. Pool Ltd. celebrated its first 150 years of business. Over the years the Hayle firm has manufactured industrial and

horticultural hand tools, cloches, greenhouses, outboard motors, military field equipment, aircraft parts, seats and heavy production machinery. Metal perforating was begun in the late nineteenth century and the firm invented the Cornish Gauge, a copper plate punched with progressive hole sizes, which became a standard specification for wire screens. Among the sand and gravel screening plant manufactured by J. & F. Pool was their patented 'Superfex' stone screen of 1927.

Following more recent developments, the firm is said today to be a European leader in perforated and expanded metals and materials.

Crossness engines

The world's largest rotative beams engines at Abbey Wood, London SE2, are open for visits on one Tuesday and Sunday in each month of 1999. Admission is by appointment only, by telephoning 0181 311 3711 on Tuesdays and Sundays only.

PUBLICATIONS

Local Society and other periodicals received

Abstracts will appear in *Industrial Archaeology Review*.

Australasian Society for Historical Archaeology Newsletter,

Volume 27:4, 1997

BIAS Journal, 30, 1998

British & Irish Archaeological Bibliography, Volume 2, Number 2,

October 1998

Brunel Exhibition Rotherhithe Newsletter, No. 36, Spring 1998

GLIAS Newsletter, 178, October 1998

Greenwich Industrial History, Volume 1, Issues 2 & 3,

June & August 1998

GSIA Journal, (Gloucestershire) 1997

Historical Model Railway Society Journal, Volume 16, No. 5,

January - March 1998

Industrial Heritage, Volume 16, No. 3, Autumn 1998

Institution of Historic Buildings Conservation News, 6, August 1998

International Stationary Steam Engine Society Bulletin, Volume 20

No. 2, Summer 1998

The Mole, (newsletter of the Friends of Williamson's Tunnels),

Issues 3, 4 & 5, August 1997, January & May 1998

The Mundling Stick, Volume 4 No. 4, Autumn 1998

The Musical Museum and Friends, Issue 22, Spring 1998

The National Trust Annual Archaeological Review, No. 6, 1997-98

Nottinghamshire Industrial Archaeology Society Journal, Volume 23,

Part 2, September 1998

The Record, RCHME/NMR newsletter, 22, Autumn 1998

Scottish Industrial Heritage Society Review, Issue No. 39,

Autumn/Winter 1998

Somerset Industrial Archaeological Society Bulletin, No. 78,

August 1998

Surrey Industrial History Group Newsletter, Nos. 99 to 105,

September 1997 to September 1998

Sussex Industrial Archaeological Society Newsletter, No. 100,

October 1998

TICCIH bulletin, number 2, Autumn 1998

Triple News, (Newsletter of the Kempton Great Engines Trust),

Numbers 4 to 7, Autumn 1997 to Summer 1998

Books Received

The following books have been received for review in *Industrial Archaeology Review*.

Lambley Viaduct: The History, Decline and Restoration of a Great Monument, by Robert Forsythe & Charles Blackett-Ord (North Pennines Heritage Trust, 1998) 32 pp, 14 ills, £2.50 inc. p&p, ISBN 0-9513535-5-1.

This booklet provides a history, details of restoration and a guide to the viaduct spanning the South Tyne valley carrying the 13-mile long railway from Haltwhistle to Alston which opened in 1852.

Stott and Sons: Architects of the Lancashire Cotton Mill, by Roger N. Holden (Carnegie Publishing, 1998) 272 pp, 167 ills, £14.95, ISBN 1-85936-047-5.

In the second half of the nineteenth century Oldham became the major cotton spinning town in Britain and architects from Oldham came to dominate the business of designing cotton mills in the county. This book traces the history of Stott & Sons, who were one of the oldest and most prominent firms in the business. They were also involved in the promotion of cotton spinning companies and, as a general architectural practice, designed other buildings including houses, schools and a watch factory.

Discover Dorset: The Industrial Past, by Peter Stanier (Dovecote Press, 1998) 79 pp, 54 ills, £4.95, ISBN 1 874336 55 5.

One in a new series of well presented and illustrated pocket-sized books on a wide range of topics about the county. Includes brief accounts of the main industries.

Made in Lancashire: A history of regional industrialisation, by Geoffrey Timmins (Manchester University Press, 1998) 365 pp, 27 ills, £50.00, ISBN 0-7190-4539-8.

This volume provides an up-to-date, contextualised analysis of industrialisation in Lancashire from Tudor times until the 1990s. Drawing on the extensive literature relating to the theme, and incorporating new research findings, it examines the rise and decline of the county's industrial sector. While the long-term dominance of the textile industry is emphasised, its importance is viewed as part of the wide range of industrial activity that came to characterise the county's economy.

The Moorfield Pit Disaster, by Harry Tootle (Landy Publishing, 1998) 64 pp 17 ills, £6.00, ISBN 1 872895 38 7.

An account of a colliery explosion underground at Moorfield Colliery, near Accrington in Lancashire in 1883.

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Yorkshire and Humberside

The restoration of the Huddersfield Narrow Canal across the Pennines from Huddersfield to Ashton under Lyne is being funded mainly by the Millennium Commission (£15m) and English Partnerships (£12m). It involves the removal of 19 blockages. In the three-mile Standedge Tunnel, Britain's longest canal tunnel, accumulated silt will be cleared to lower the water level and ease the passage of boats. It is proposed to use electric tugs, but it is not clear whether legging through will still be allowed. The Standedge rail tunnels of 1846-9 and 1868-71, closed in 1966 (since when all traffic has used the parallel double track tunnel of 1894) may be reopened for freight to help divert traffic from the congested M62 to rail.

The restoration of Linton Lock, on the Ouse north-west of York, has been completed with a substantial grant from the Heritage Lottery Fund, and it was reopened in September 1998. The lock dates from the 1770s and was designed by John Smith who was also engineer of the Ripon Canal. A report on the Barnsley and Dearne and Dove Canals for Barnsley, Wakefield and Rotherham Councils has concluded that their restoration would cost £31.55m and that this could not be found; smaller schemes, such as linking the Elsecar branch of the Dearne and Dove Canal to the Sheffield and South Yorkshire Navigation, might have a better chance.

On the Chesterfield Canal, work has continued on restoring the section from Shireoaks to Kiveton Park and Northwood Tunnel. Plans by developer Tawnywood, supported by the Chesterfield Canal Trust and British Waterways, to opencast and reclaim the site of Kiveton Park Colliery would create a marina there and open out the tunnel (opened in 1776 and closed by a roof fall in 1907) as far as the M1. Longer term plans may include a staircase of locks or even an inclined plane down to the Rother valley where a housing development blocks the previous route, and a brand new navigation down the Rother to the Don at Rotherham.

The canal dry dock at Goole has now been filled in, but we understand it will not be built on (see *IA News 106*, p12). On the North Yorkshire coast, excavation for a sewerage

scheme at Whitby has revealed a large stone-built dry dock used from 1755 to 1770 to service colliers and other ships; it has been recorded and will be preserved beneath a car park.

The West Yorkshire Archaeology Service has carried out an excavation at the site of Kings Mill, Leeds, a corn mill on the Aire. The oldest timbers found beneath stone wheelpits were dated to the twelfth century. There is a new multi-million pound scheme to convert the derelict Grade II* listed Hunslet Mill, Leeds, and the adjoining Bruce's Works to flats, offices and factory retail outlets. John Foster & Son have ended the manufacture of worsted and mohair cloth at Black Dyke Mills, Queensbury, near Bradford, and now carry out only final inspection there. York University archaeologists have gained Lottery funding for a project to collect data on successful conversion projects for old industrial buildings.

An English Heritage list of buildings at risk has highlighted the unique Grade II* 1871 Large Crucible Steel Shop of Sanderson Kayser at Darnall, Sheffield, where plans for refurbishment were dropped after a change in ownership. Local groups are also concerned about several derelict cutlery and silverware works including Anglo Works in Trippet Lane and Morton's in West Street. The Cornish Place works of James Dixon is now being converted into flats and there are plans to turn the adjoining Globe Works (edge tools and cutlery) and Wharcliffe Works (stovegrate foundry) into offices, with some demolition.

The buildings and structures of the coal industry continue to disappear but an 1870s Guibal ventilating fan house at the former East Gawber Hall Colliery, Barnsley, has been scheduled as an Ancient Monument, and the pioneer 1902 Tankersley mines rescue station at Birdwell, Barnsley, has been listed. The government announced in October that the National Coal Mining Museum at Caphouse Colliery is to receive £700,000 to keep it open for a year while the level of funding is decided. The collections will be owned by the Science Museum but the site and management will remain in the hands of the present trust. The decision will ensure that it can continue to offer underground visits. A study by RCHME has thrown new light on its history and made recommendations about conservation.

The Calderdale Industrial Museum, Halifax, and Transperience, Bradford, have now closed but there is better news from elsewhere. The Museum of Army Transport, Beverley, has reopened, and the National Railway Museum, York, has been given £2m of Lottery money to display thousands of items kept in storage. In Sheffield, the new Sheffield Industrial Museums Trust reopened Abbeydale Industrial Hamlet to school parties and during the school summer holidays, and hope to reopen it to the public during 1999. Shepherd Wheel opened for Heritage Open Days but remains closed for the present. Wortley Top Forge remains open on Sundays on a shoestring after a decision by the National Trust not to take it over.

Derek Bayliss and David Cant

East Midlands

The East Midlands Industrial Archaeology associations are a loose-knit organisation scattered throughout the length and breadth of the counties of Leicestershire (Leicestershire Industrial History Society), Northamptonshire (Northamptonshire Industrial Archaeology Group), Derbyshire (Derbyshire Archaeological Society-Industrial Archaeology Section), and Lincolnshire (Society for Lincolnshire History and Archaeology), together with the East Midlands group of the Railway and Canal Historical Society.

We also have associations with other groups such as the Brewery History Society.

At six-monthly intervals, and on a rota basis, one group will organise a whole day Conference based on the IA of their locality, with morning lectures, a buffet lunch, the Business Meeting (usually short), and with the afternoon devoted to visits to local sites - a bit like a mini AIA Conference!

We have just put on EMIAC 56. Based at the Bass Brewery Museum, it was, of course, very well attended!

A report appears elsewhere in this issue of *IA News*. Incidentally, in May this year EMIAC 57 will have some beer content too. The secretaries of these groups meet about two or three times a year to discuss plans etc. and proceeds from the conferences are used to finance local projects, as agreed by the business meeting.

The money accrued is passed to the next organising group.

Leicestershire Industrial History

Society also try and arrange a week-end away over the May bank holiday, again to a part of the country with Industrial Archaeological interest, where we can take advantage of local help and expertise; this year it was to Somerset. The EMIAC conferences attract up to 100 people, and the May week-end brings out about 30 or so.

Both Leicestershire and Nottingham seem to be having a spate of applications to turn buildings of some historical significance into pubs and restaurants. The latest in Leicester is conversion of the Hydraulic Accumulator House, which was part of the Great Central goods warehouse and freight handling complex, and in Nottingham there is a larger scheme to convert the Low Level station complex into a car showroom, pub and restaurants etc.



Conversion job: the Hydraulic Accumulator House, Leicester

Photo: D Lyne

Northampton is the only local group reporting increased attendance at their meetings, and suggest that this is because they have gone outside the strict IA scope into, for example, Roman engineering and the country house garden (some will say this is well within the expected scope of interest anyway!).

Derbyshire reports that despite being a predominantly rural area, they have so many old mine and lime kiln sites that they have difficulty in prioritising what to take on board for recording.

Northampton report that Rices Eagle Foundry, established in 1823, has had to close with the loss of several jobs. This is due to the complaints from residents of new houses, which had been allowed to be built nearby, and resulting in the

local authorities imposing environmental controls which made the foundry costs prohibitive.

Northampton also confirm that they have been involved in discussions regarding the Northamptonshire County Structure Plan, but the involvement has been mainly through various environmental panels which have been dominated by representatives of ecological groups, and it has been very difficult to get a hearing for Industrial Heritage. They would like to hear from other societies as to how to cope with this situation.

Lincolnshire are concerned at the disturbing loss of military structures of late, which was evident at the EMIAC held there last year.

They also report that Lincoln City Council and English Heritage are jointly funding project to extend the Urban Archaeology database from 1700 right up to 1945, thus covering the whole of the period of industrial expansion in the city.

The Railway & Canal Historical Society also report that the Nottingham Museum of Industry and Transport are planning to set up The Centre for Framework Knitting at the Heritage Centre at Ruddington.

Finally, apologies for not bringing you a great deal of news, but this is also an attempt to bring you up to date with the East Midlands scene, as this is my first report as regional correspondent. Readers may contact me by Telephone/Fax on 0116 2891 595, mobile 0973 189 315, or e-mail on davidlyne@compuserve.com, and I will pass on messages to the relevant secretaries.

David Lyne

East Anglia

This year little seems to have happened in East Anglia, so this report is brief. In part this may be due to lack of information, especially concerning Essex. The eighth East of England IA Conference was held in Bury St Edmunds in June, with a programme rather rushed together at the last minute because of the withdrawal of one speaker and unfortunate demise of the other. However the replacement lecturers proved worthy substitutes, speaking about seventeenth and eighteenth century trades in Bury and on the general industrial archaeology of West Suffolk. The afternoon visit was a tour of south Suffolk led by Bob Malster, and included cast iron bridges and Sudbury Quayside. Next

year's EERIAC will be in King's Lynn (see Diary).

In Cambridge, the small nineteenth-century gas holder with attractive cast-iron supporting columns, the oldest on the gasworks site, has escaped the redevelopment of the rest of the site, but its future is far from clear. Next door, at Cheddars Lane Pumping Station a major crack in the engine house wall has been repaired with funding from the local authority and English Heritage. Proposals for new housing which would have affected badly the view of the building from the river have been rejected. New proposals are awaited.

In Suffolk, there is some concern at the 'conversion' of the very large maltings block on Pelaw Street, Ipswich, which has seen the interior totally gutted and the wooden roof structure removed to be replaced with steel; only the walls remain. Confidence is not helped by the estate agent's references to the 'oast houses' at the end of the block. Proposals for the Town Maltings at Diss leave something to be desired also. Maltings in East Anglia have suffered badly in the last few years. Only two floor maltings remain in use, at Ditchingham and East Dereham, and the future of neither seems secure. Six years ago there were at least eight still working, including three large complexes. Even where there has been conversion rather than demolition, it is almost unknown for the kilns to remain intact.

Also in Ipswich the final remains of the horse tram depot and E R F Turner's engineering works have disappeared under a multi-plex cinema, and Ransome's Orwell works have been finally cleared. Better news is that the recently closed turn of the century Cranfield roller mill on the dockside is within the recently extended conservation area and so given some protection.

Elsewhere in the county, the unique level crossing gates carrying the platforms at Halesworth station are to be restored, though not to working order, and the town museum is moving into the restored station building where it will have a display on the rail history - though all traces of the Southwold Railway have been obliterated. English Heritage have had to close Saxtead Green Mill until repairs have been made to rot in the main steps.

In Norfolk, there is still no news about the Colman's site in Norwich,

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and it is far from certain that no news is good news. However, Railtrack have done a fine job at Norwich (Thorpe) station where, as hoped last year, the war-damaged roof line of the main building has been restored to its original state and the chateau-style dome reclad in zinc/lead plates by French craftsmen. Plans to gut some of the office blocks were abandoned in favour of restoration. Damaged sections of the cast-iron railings round the forecourt are being replaced and the brick gate posts at the entrance recreated, though for traffic reasons not the gates themselves. The whole exercise is a good example of constructive collaboration between Railtrack and the city conservation committee.

Norfolk IA Society have recorded an example of a mass concrete brick kiln at Bradfield. At Ebridge flour milling has finally ceased at a site whose recorded history goes back to AD 980. The opportunity is being taken to investigate its history, with much helpful information coming from the local area. Although the ornamental facade to the 1895 power

station at Yarmouth has now been demolished, the site and its history have been written up in the NIAS Journal. Also in recent years NIAS have published research by Anthony Ward on Broadland steam pumping stations originally undertaken in the '50s and '60s when much equipment was still in situ. The existence of this research only came to light by chance. It's worth trying to find out if there is anyone in your area with a hobbyhorse and unpublished material!

David Alderton

**ADVERTISE
IN
IA NEWS**

**See page 8 for
details**

**20 March 1999
ANNUAL WINDMILL
MEETING**

one day meeting to be held in London, on aspects of windmill sail design and wind power use. Details from Diana Smart, Administrator, Mills Section SPAB, 37 Spital Square, London E1 6DY. ☎ 0171 456 0909.

**27-28 March 1999
AIA IRONBRIDGE WEEKEND**

at the Long Warehouse, Coalbrookdale, on 'Raising the wind - sources of grants for industrial archaeological projects', particularly aimed at volunteers (individuals and societies) working in the area of IA. Contributors will include officials from the National Lottery and the Science Museum PRISM fund. Full details and booking form (SAE please) from David Alderton, 48 Quay Street, Halesworth, Suffolk IP19 8EY.

**10 April 1999
SOUTH EAST REGION IA
CONFERENCE**

at the University of Reading, hosted by the Berkshire IA Group, a programme including London docklands, cinemas, Brede Waterworks and the importance of geology and groundwater to industry. Details from Dennis Johnson, 20 Auclum Close, Burghfield Common, Reading, RG7 3DY.

**17 April 1999
30TH SOUTH WALES & WEST
REGION IA CONFERENCE**

at Shaftesbury Upper School, hosted by the Dorset IA Society. Conference, followed by optional visits to a local mill or the RN cordite factory site at Holton Heath. Details from Tony Innes, 10 Gold Hill, Shaftesbury, Dorset SP7 8HB.

7 May 1999

IRISH MILLS AND MILLING
a one-day seminar at Enniskillen College of Agriculture, County Fermanagh, hosted by the Belcoo and District Development Group Ltd. For further information and booking details, contact Dr Colm Donnelly, Belcoo Enterprise Centre, Railway Road, Belcoo, County Fermanagh, Northern Ireland, BT93 5FG. ☎ 01365 386536, Fax: 01365 386377.

**8 May 1999
EMIAAC 57: BRIDGES, BEER
AND BALL BEARINGS**

at the Town Hall, Newark-on-Trent, the 57th East Midlands IA Conference, with speakers on historic crossings of the Trent, Baird's floor maltings and Newark's brewing industry, with afternoon guided walks. Details from Joan Hodges, Nottingham IA Society, 2 Knighton Road, Woodthorpe, Nottingham NG5 4FL.

**8-9 May 1999
NATIONAL MILLS WEEKEND**
previously one day, and now extended to two, some 400 mills take part in this annual event. The theme this year is arts and crafts. For details, contact Diana Smart, Administrator, Mills Section SPAB, 37 Spital Square, London E1 6DY. ☎ 0171 456 0909.

**21-23 May 1999
THOMAS TELFORD IN
SHROPSHIRE**

a weekend looking at the work of Thomas Telford, with field trips and lectures on his work, roads, bridges and canals. For further information please contact Julia Ionides, 83 Greenacres, Ludlow, Shropshire SY 1LZ. ☎ 01584 874567, Fax: 01584 874045, e-mail: dogrose.trust@virgin.net

**3-6 June 1999
ANNUAL CONFERENCE OF
SOCIETY FOR INDUSTRIAL
ARCHEOLOGY**

in Savannah, Georgia, USA, the 28th annual conference of the SIA. For details, contact Fredric L. Quivik, 2830 Pearl Harbor Road, Alameda, CA 94501, USA. ☎ and Fax: 510-769-7855, e-mail: fquivik@lmi.net

**12 June 1999
EAST OF ENGLAND REGION
IA CONFERENCE**

at King's Lynn, the ninth EEIRAC. Full details and booking form (send SAE) from Mrs Brenda Taylor, Crown House, Horsham St Faiths, Norwich NR10 3JD.

**9-11 July 1999
27TH ANNUAL HISTORY OF
ELECTRICAL ENGINEERING
WEEKEND**

at the University of Bristol, with a programme of lectures and visits to local museums and places of historical interest. Further details from Helen Pope, SET Division, IEE, Savoy Place, London WC2R 0BL. ☎ 0171 344 5439, Fax: 0171 497 3633, e-mail: hpope@iee.org.uk

**7-10 September 1999
PRESERVATION OF THE
ENGINEERING HERITAGE:
GDANSK OUTLOOK 2000**

the third conference on industrial history to be held at the Technical University. Their home page is at: <http://www.pg.gda.pl/~pehgo2000/> For details contact International Conference Preservation of the Engineering Heritage - Gdansk Outlook 2000, Secretary, Waldemar

Affelt, Wydział Budownictwa Lądowego, Politechnika Gdanska, ul. G. Narutowicza 11/12, 80-952 Gdansk, Poland.

**10-17 September 1999
AIA ANNUAL CONFERENCE
1999**

at Chatham, Kent. Details when available from Conference Secretary, Janet Graham, 107 Haddenham Road, Leicester LE3 2BG.

Information for the diary should be sent directly to the Editor as soon as it is available. Dates of mailing and last dates for receipt of copy are given below. Items will normally appear in successive issues up to the date of the event. Please ensure details are sent in if you wish your event to be advised.



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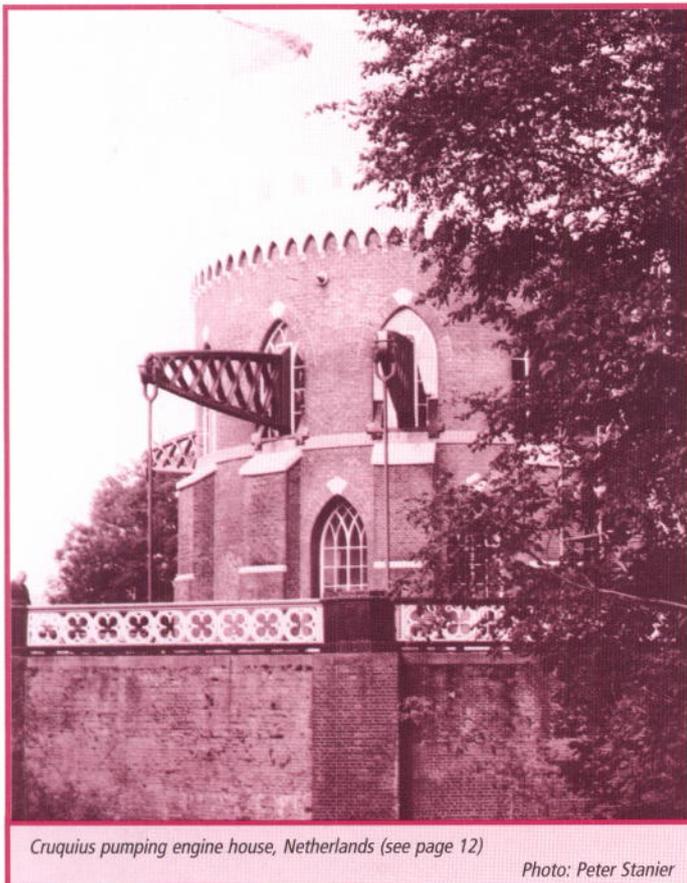
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- 30 December for February mailing

The AIA was established in 1973 to promote the study of Industrial Archaeology and encourage improved standards of recording, research, conservation and publication. It aims to assist and support regional and specialist survey groups and bodies involved in the preservation of industrial monuments, to represent the interests of Industrial Archaeology at national level, to hold conferences and seminars and to publish the results of research. The AIA publishes an annual Review and quarterly News bulletin. Further details may be obtained from the Liaison Officer, AIA Office, School of Archaeological Studies, University of Leicester, Leicester LE1 7RH. ☎ 0116 252 5337 Fax: 0116 252 5005.

The views expressed in this bulletin are not necessarily those of the Association for Industrial Archaeology.



Cruquius pumping engine house, Netherlands (see page 12)

Photo: Peter Stanier