ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

AIA Bulletin

VOLUME 8 NUMBER 1

Another successful AIA Conference has come and gone with glorious weather and impeccable organisation (despite the University of Liverpool's apparent disregard for a proliferation of weekend conferences within one residential complex) it remains as a jewel in a soggy summer and gloomy autumn. Originally sited on Merseyside in deference to the 1980 celebrations surrounding the Liverpool and Manchester Railway, it tended to suffer from over exposure to this particular anniversary. However, Liverpool triumphed and those who attended were soon captivated by that undefinable mixture of brash good humour and undisguised self congratulation.

As a tribute to the Liverpool and Manchester, as a sincere thank you to Bernard Brett and his colleagues we are printing in full one of the many Conference handouts. It tells a story of practical industrial archaeology, it has a happy ending and it seems to typify the 'scouse' attitude. 'It didn't just start here, it's still going on'.

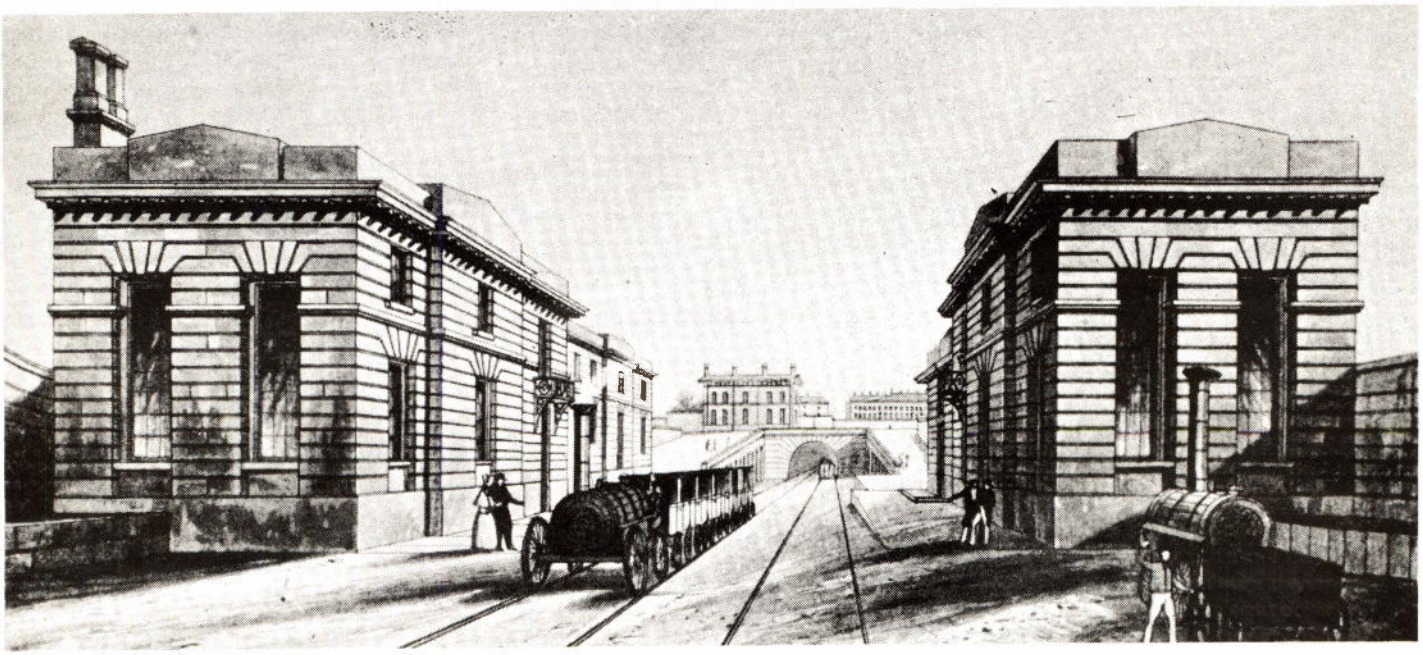
Railways started here. About 400 yards from the present Edge Hill station in Liverpool is the original terminus of the L and MR from where, on 15th September 1830 the locomotive Northumbrian lead out the procession to open that railway and to usher in the Railway Age. Although the passenger building has gone from Crown Street, the ruins of the engine still remain in a cutting beneath Chatsworth Street. It was from here that locomotives such as 'Rocket' took over from the ropes used on the first sections of track.

In 1976 students and staff from the CF Mott College of Education and County Museums completed a survey of the site and found considerable remains of stables, locomotive sheds, boiler houses, chimney flues, and the famous Moorish Arch. Encouraged by these finds it was decided to mount a series of excavations under the auspices of the NW Society for Industrial Archaeology and History to see what remained of the rope haulage system.

Work began in the spring of 1977. With the financial assistance of the City of Liverpool Heritage Bureau, mechanical excavators cleared much of the overburden, and, exactly where historical sources suggested, the foundations of the Moorish Arch appeared. This arch, designed by the Liverpool Architect, John Foster, was the first example of monumental railway architecture and contained the stationary engines provided by Robert Stephenson to drive the rope haulage machinery. Continued excavation found deep wheel-pits underneath the tracks, which contained the massive iron pulleys which drove the continuous rope. Also found were the various ducts which connected the eight boilers together and a number of cast iron pieces, one of which turned out to be a pulley inscribed "L & M 1842". Excavation finished during 1979, when the site was handed to the Edge Hill Railway Trust, a company limited by guarantee and registered as a charity which was charged with opening the site to the public, and establishing a related exhibition in the nearby Edge Hill Station.

The present station was built in 1836, at the same time as the first Lime Street Station. Designed most probably by the Liverpool architect John Cunningham, it has served passengers for longer than any other station in the country. Until 1870 it was the point at which the steam locomotives took over from the ropes which had hauled the carriages up from the Lime Street terminus.

Its claim to be historically significant in the development of railways was first recognised in 1974, when members of the NW Society for Industrial Archaeology and



Edge Hill Station in 1836, as published by Ackermann.

History were comparing a contemporary print published by Ralph Ackermann with the buildings still standing. Hidden away among the late 19th century extensions and awnings were the classical structures of John Cunningham.

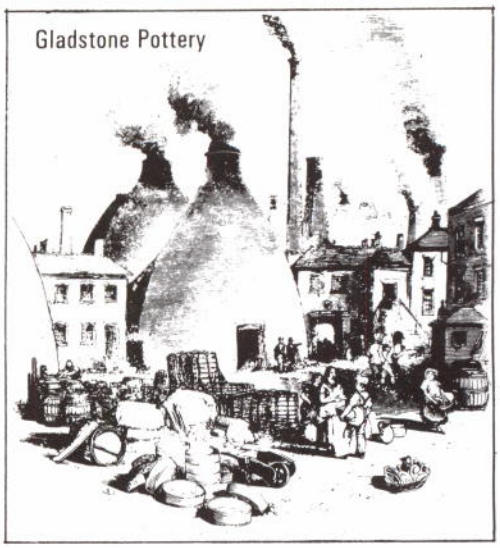
Because of its importance the Society called upon the City Council and Victorian Society to support its application to the Department of the Environment to have the building listed, and thus protected by law. The listing was made in November 1974, coincidentally at about the time when British Rail was considering the need to rationalise facilities there and refurbish accommodation. Fortunately the listed portions of the station were the ones that BR wished to retain, and the hopes of the Society completely coincided with the views of a sympathetic BR architect.

Demolition and refurbishing work took place during 1978 and 1979. Late 19th century extensions were removed along with the canopies already cut back during the electrification programme of the 1960's. Eventually the two office blocks and the realized engine houses emerged into the light of day.

Now, in 1980, exactly 150 years after the railway opened they stand clear and new, fitting memories to the place where railways began.

AIA Secretary Paul Stephens has supplied the following personal impressions of **A Tale of Two Museums.** On a narrow boat holiday along the Caldon Canal from Stoke-on-Trent anyone interested in industrial archaeology will think of the pottery and china industry for excursions. As the Gladstone Pottery Museum at Longton was near to the start of our holiday and the Wedgwood Museum at Barlaston was adjacent to our return, they were both convenient to visit. They also form a very interesting contrast. Gladstone is of course in original buildings while the Wedgwood Museum is purpose built. There are other contrasts, however, such as the parts of the pottery or ceramic industry displayed - Wedgwood is universally recognised as producing items of the very highest quality while Gladstone is very much concerned with everyday pottery and each tells a different story.

On arriving at Gladstone, one enters a different period by virtue of the retention of existing buildings. For most people the first glimpse into the interior of a bottle oven with the sides of saggars piled high does more than any number of words to show the processes and working conditions. Here the original buildings are being used for their original purpose, and one can see piles of clay, half finished ware, overalls and unswept floors. These comments are not intended to be insulting, rather complimentary in that the ideal of a working pottery has been deliberately created. For instance, thank goodness the stationary steam engine which provided the power to drive the clay mixing machinery in the sliphouse is still there, although now turned by electricity. The shop stocks a range of pottery produced on the premises and the concept of a working museum, showing off the processes and partially earning its keep - by selling its own produce, is somehow very satisfying. Especially when the museum is a charitable trust although initial support from industry and local authorities was received. Since my last visit - with the AIA - at the Keele Conference, there have been one or two additions. These were really not directly related to Gladstone itself but rather to the history of ceramics in the area. I could not help getting a rather odd sense of awe and amazement when viewing the exhibition of sanitary ware. The enormous Victorian baths, decorated loos and hand basins, different types of patent flushing system, all seemed to emphasize how important the Victorians considered both design and function-



alism. Similarly, the visitor receives a mental shock on visiting the exhibition of tiles with a blaze of different colours and shapes.

The contrast at the Wedgwood Museum at Barlaston could not be greater. All the buildings - forming part of the works at Barlaston - are modern giving no impression of what the pottery or china industry was like previously. An indication of the working conditions and buildings of the company in the past is gained from photographs, engravings and captions. The exhibition consists of a reception area, cinema and lecture theatre, production display area, and a showroom.

Judging from the number of Americans present - and buying - the showroom must help to implement the cost of the museum. But this is a company museum - the objectives and methods are different. Too often I get the feeling that industrial archaeologists tend to have reservations about company museums simply because the company obviously wishes to obtain commercial prestige and publicity from its museum activities. In this case the company museum was first established at Etruria in 1906 and now contains some 6,000 pieces, with archives containing pattern books, experiment and recipe books, business and personal letters and maps and engravings of the Stoke area. The lecture theatre is a good example. It has soft lighting, a gentle rake to the auditorium, full carpeting and attendants to oversee your every comfort. (Incidentally, the museum attendants were unfailingly courteous and helpful). There is an admission charge and over 30,000 visitors a year arrive to see the museum, but it is doubtful if this money and the china sales cover the cost. It is interesting to see that in the production display area there are no permanent staff and employees from the works take it in turns to have a two-week period carrying out their work in front of the public and answering their questions. The production area itself seems both logical and inevitable in a modern factory. A film shows the full works itself, but clearly the distances to be covered and the general noise and working conditions would make it difficult to show the public the manufacturing processes in acceptable conditions of safety and comfort. Instead, in one large hall the company has brought together all the processes from preparation of the clay to final decoration.

The museum itself aims to cover more than just the history of the company alone, setting

out the history of production of pottery and ceramics both by Wedgwood and other in the Stoke area. The museum has to be admired as a collection and it is difficult to believe that anyone could fail to find something of interest. There is a good catalogue.

Of all the items at the museum, the one that impressed me most was a printed hand bill in which Josiah Wedgwood thanked all his employees when, during his campaign for election to Parliament his employees had made a collection to support his campaign funds. It is difficult to imagine this happening today. Obviously, Josiah Wedgwood was pleased to have received his employees' support, but more importantly he appreciated the significance of that support. When thanking his employees he made the comment that he had always tried to run his business on the assumption that his interests as the employer and those of his workers were complementary - neither could succeed without the other and his gratitude was not to receive a sum of money but that by making such a collection his employees appreciated the partnership between owner and worker.

PLAIN JOS. Industrial history has provided a number of lively subjects for the theatre, and a number of very stimulating stage presentations have sprung from the germ of an idea, tossed around among a company of professional actors, with the script evolving organically as they rehearsed the theme against a background knowledge of the period rather than working from a written text.

London audiences have recently been treated to nine hours at a time of **Nicholas Nickelby** enthrallingly interpreted by the RSC. Manchester has recently seen **Love on the Dole** at the Royal Exchange Theatre, while the figure of I K Brunel appeared on the Bristol New Vic stage a few years ago in a play about the Bristol Riots of 1831, at which Brunel was in fact present. The 250th birthday of Josiah Wedgwood is the occasion for a new musical documentary at the Victoria Theatre, Stoke on Trent which will help to illuminate the era of one described as the most important single figure in the history of the Staffordshire Potteries. Wedgwood's importance was by no means confined to his own trade, in which he was a foremost innovator; he was also surrounded by a galaxy of brilliant contemporaries from other fields, scientists like Erasmus Darwin, Joseph Priestley and Benjamin Franklin, artists like Stubbs and Joseph Wright of Derby, and engineers like James Watt and Brindley. Although he counted these great figures among his friends, and foremost members of 18th century society among his patrons, Wedgwood was most at home in his native Etruria and liked nothing more than to be called 'Plain Jos'. The play of the same name researched and compiled by Joyce Cheeseman and with traditional songs and music by John Kirkpatrick is in repertory until the end of November. Further details from Victoria Theatre, Hartshill Road, Stoke on Trent ST4 6AE. tel 0782 615962.

IMPROVING MILL SAFETY. Those who operate wind and water-mills will not need to be reminded of the dangers inherent in working heavy, powerful and sometimes unpredictable machinery. These hazards are increased when members of the public are encouraged to visit and watch the milling operations.

The Wind and Water-Mill Section of the Society for the Protection of Ancient Buildings has recently drawn up a set of guidelines for the benefit of those planning to restore mills to working order. Topics include the control of visitors, creating safety awareness among volunteer staff and the provisions of the Health and Safety at Work Act. Copies of the pamphlet can be obtained from the SPAB at 55 Great Ormond Street, London WC1N 3JA.

NEW TURF . More than 150 years ago, a hostelry was opened at the seaward extremity of the Exeter Ship Canal to provide shelter and victuals for boatmen using the canal and stabling for the horses which towed ocean-going vessels to and from the port of Exeter nine miles up the Canal. Adjoining Turf Lock the hotel served also as accommodation for the lock-keeper. Although prominently situated on a small peninsula and readily visible both from the Exe Estuary and the main Exeter-Plymouth railway line which passes nearby, the Turf Hotel is isolated, being 1000 yds from the nearest occupied building, a farm. It has no road access, which may have helped to save it from the worst depradations of the vandals since the resident lock-keeper was withdrawn some years ago, but the wind and rain have taken their toll of the slate-hung building, and its condition was such that the Exeter City Council proposed to demolish it and build a bungalow for the lock-keeper instead. The Exeter Maritime Museum has however, long been a champion of the Ship Canal along which many of the Museum's foremost floating exhibits have completed their journeys and which enables Museum volunteers to take exhibits to sea on occasional demonstration sails. Following intervention by the Museum's director, Major David Goddard, the Turf Hotel has been listed by the DoE and repairs have been carried out with the help of the Museum's volunteers. Travellers arriving on foot or bicycle or by boat can now obtain refreshment, and eventually there will be overnight accommodation again (whether for horses as well as for humans depends on demand). The massive curved gates of the Turf Lock are an interesting feature of this part of the waterway and the Exe Estuary is a celebrated area for bird watching. Enlightened intervention by an imaginative body, backed by practical repair work by museum volunteers has thus saved from demolition a building which would otherwise have shared the fate of so many properties inherited by local authorities. Further details of this welcome new facility on the Canal bank, and of other features along this, England's earliest Ship Canal, from Exeter Maritime Museum, The Quay, Exeter, Devon. Tel. 0392 36031.

Paul Sowan of the Croydon Natural History and Scientific Society has supplied these two interesting items in the hope that they may produce some feedback. Comments should be sent direct to Paul at 96a Brighton Road, South Croydon, Surrey CR2 6AD.

'Brockham' Patent Lime-Kilns. Alfred Bishop, of the Brockham Brick Co. Ltd., patented an improved design of continuous lime-kiln in 1889 (patent No.14,997 of that year) and existing flare-kilns at the lime-works operated by the company near Box Hill in Surrey modified to conform with the patent specification, and were in use until lime burning on the site ceased in 1936. By that date the Brockham Lime & Hearthstone Co. Ltd. had been formed and had taken over the working of the site, but that company hac in turn become a subsidiary wholly owned by the neighbouring Dorking Greystone Lime Co. Ltd., Oxted Greystone Lime Co. Ltd. and others. The Dorking company, operating a limeworks in the adjacent parish of Betchworth, built and operated 'Brockham' kilns for a number of years. It also had a number of other interesting kilns in use at

one time or another - Hoffman brick kilns, and Dietzsch cement kilns were both redesigned and modified for burning lime.

The most characteristic features of the Brockham patent kilns are the tapering egg-shaped firing chamber, and the unusual method of charging. Chalk was put into the kiln through a tall wide chimney on top, whilst coal was fed, a small quantity at a time via eight or so small chutes arranged round this, so that it entered the kiln around the circumference and its ashes were fairly effectively kept apart from the lime. Operating the kilns involved removing an iron lid from each chute in turn, for each kiln, and feeding in a charge of fuel every so often - for a bank of eight kilns (of which Brockham limeworks had two such banks) must have been extraordinarily labour-intensive!

In 1892 John Briggs, of Clitheroe, Lancashire, patented a somewhat similar design (patent No.7,308 of 1892), although the firing chamber profile was broader, the coal-chutes were longer and at a shallower inclination, and an open top was envisaged rather than a tall chimney.

Can AIA members cite any other similar kiln designed, or provide any information about sites where either of these or similar designs were used?

It would also be interesting to know of other locations where such kilns, or modified Hoffman or Dietzsch kilns for lime burning, were used or survive. One substantially complete, and several derelict and demolished 'Brockham' kilns, survive at Brockham, and two derelict and one unused modified Dietzsch kilns survive at the Betchworth limeworks in Surrey.

Hearthstone an abrasive and whitening agent for stone hearths, floors, doorsteps, etc. appears to have come into fashion early in the 19th century. The Oxford English Dictionary's first citation of the word in this sense is from about 1840.

In Surrey, hearthstone was obtained from mines developed from firestone, or Reigate stone, quarries in the Upper Greensand in the east of the county, a series of such mines being made along the outcrop from Brockham, near Box Hill, through Reigate to Godstone.

Unfortunately, in Surrey, there is confusion between 'hearthstone' as a hearth, floor and step-whitening agent and hearth-stone as a slab of stone from which a hearth was actually made. As the Surrey firestone, or Reigate, Mertham or Chaldon stone was recognized for its refractory properties and used for hearths, furnaces, ovens, kilns and chimneys, it is sometimes not possible in earlier 19th century sources to be sure which sense was intended when the word was used.

The end of the Surrey hearthstone mines' operation is well catalogued - that at Brockham closed in 1925, at Reigate in the 1940s, at Betchworth in the 1950s and at Colley Hill, Reigate, in the early 1960s. But the origins of the hearthstone mines, before the requirements of the 1872 Metalliferous Mines Regulation Act applied or were enforced, are less easy to disentangle. And the identification and elimination of the extensive Victorian hearthstone mine galleries is an essential preliminary to studying intensively the far older and more interesting underground building-stone quarries.

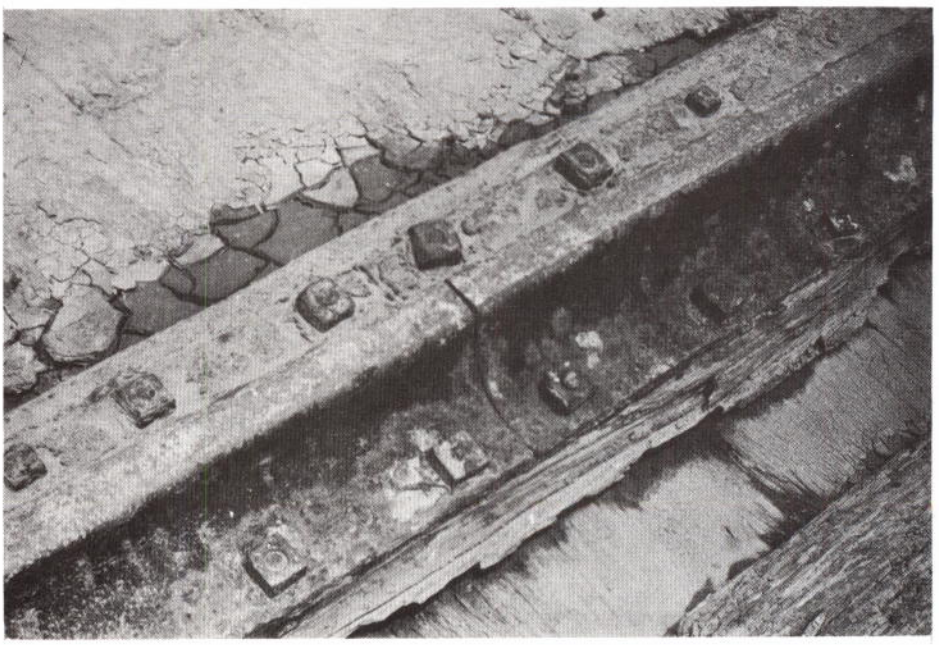
AIA members may possibly be able to help with information on the mining or quarrying or use of hearthstone from other areas - rival products are known to have emanated from counties as far apart as Kent and Durham, and probably many others too. To establish an approximate date for the introduction of the use of hearthstone for whitening would also be helpful.

Lydney barges incorporate Barlow's rail.
R.A. Barker writes: Shifting mudbanks at Lydney (SO 650013) have revealed the remains of a pair of dumb barges of curious composite construction. The incorporation and use in one of them of 50 metres of Barlow's rail, suggest a possible connection with the Bristol and South Wales Union Railway, whose ferry at New Passage preceded the Severn Railway Bridge, from 1863. Their construction is certainly not typical of wooden boatbuilding in the area.

Both barges are open, flat-bottomed, double-ended, with transverse floors in the manner of a narrow boat. In the larger barge, this floor is some 29 x 5.3 metres and 75 mm thick, with an external keel 400 x 200 mm and a keelson up to 400 mm square (one piece being 21.7m long), all clench-bolted together. The heels of the almost straight side frames rest on the floor and are bolted against a 150 mm square clamp: the spaces between these and the side planking are filled with concrete. The side was originally at least 2.1 m high, reinforced with at least one cross beam at the gunwale, and four pairs of iron knees having arms 1.4 m long and a root section 100 mm square.

There are also two longitudinal runs of Barlow's rail laid on and bolted to (with threaded bolts) a 400 x 100 mm timber bed in the hold, set to a slight curve, with about a 7 foot gauge at one end. These rails are butt-jointed and are thus of questionable structural purpose. With the fittings for the knees they make an irregular, unceiled floor to the hold.

The second barge is similar but has a rolled joist section keelson and the rails are replaced by two sizes of rolled angle back to back. In this case the sections are all spliced, and the angles are set at about 7 foot gauge amidships, but not on a timber bed. The clamp for the frames is also an angle.



Pictures by R A Barker

GUNTON PARK SAWMILL. In conjunction with the Norfolk Windmill Trust, the Norfolk Industrial Archaeology Society has undertaken the restoration of the above mill.

The mill, built at the close of the 18th century, on the Gunton Park Estate (Tel.224335) is believed to be historically unique. Sited beside the lake which provides the power source, the building itself is of unusual timber construction with a traditional Norfolk Reed thatched roof.

A visit to the site in 1977 was made by the Wind & Watermill Section of the Society for the protection of Ancient buildings. In a report following this visit, Kenneth Major suggested that the site's claim to uniqueness was the water driven reciprocating saw, such saws generally having been replaced by circular saws after 1820.

Mary Manning, an Officer of the NIAS, instigated restoration proceedings as early as 1976, but it was not until December 1977 that any progress was made. Unfortunately the gales in the early part of the year, together with natural decay, meant that by this time the building was in a bad state of repair with the thatch virtually destroyed.

Discussions were held between the Estate Trustees and the Norfolk Windmill Trust, who had also become involved, thus making this a joint project. In October 1979 the legal aspects were settled when the site was officially leased to the Windmill Trust and NIAS on a long term peppercorn rent basis, with public access assured.

This established, 'first aid' repairs were rapidly undertaken to prevent further decay. A work schedule was drawn up by the Windmill Trust to repair the fabric of the building and rethatch. Labour was provided by the Manpower Service Scheme under the direction of a foreman from the Windmill Trust. This part of the restoration is drawing to a close and attention has now been focussed on the machinery. The present phase of work includes stripping the two waterwheels, cleaning, restoring and painting the various articles and re-assembling the whole back on site. The object is to get one waterwheel in working order as soon as possible. It is hoped this work will be undertaken by NIAS members and other willing volunteers. The final aim is to restore the sawmill to full working order an to open it to the public on certain days of the year.

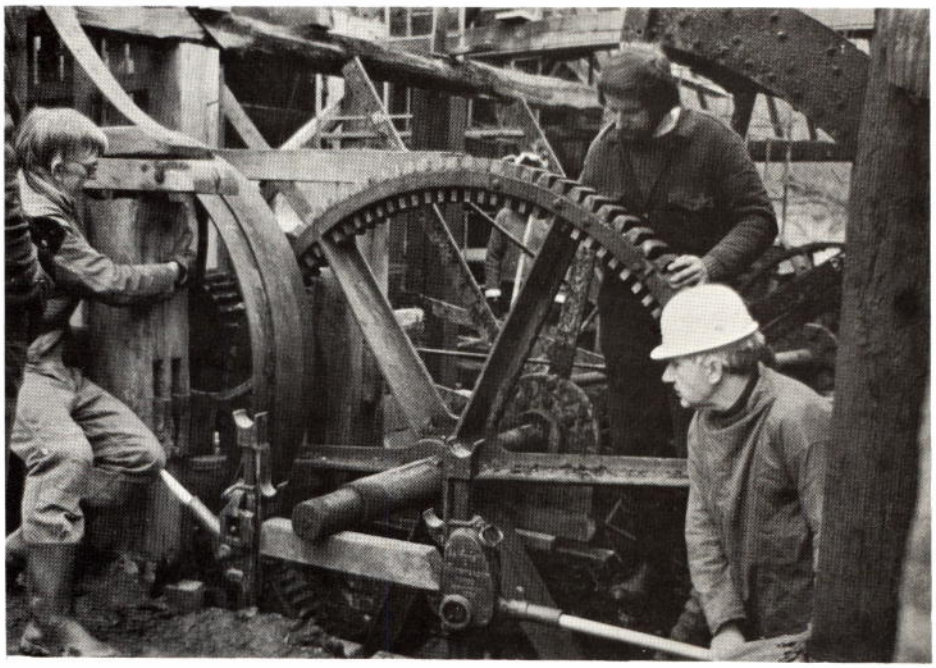
Investigating the history of the building is proving to be a slow process, records having only recently been placed in the hands of the County Records Office following the death of the owner. It is with some regret that we note that the late Hon. Doris Harbord, the owner of the Estate, having given the project enthusiastic support, died before even the first phase of restoration was completed..

Work to date has been generously financed by the Norfolk Windmill Trust but much more will be needed to complete the work.

Offers of help or advice, and donations, will be gratefully received by the Appeal Secretary, Mrs. S. Cooke, 11 Mill Close, Pulham Market, Diss, Norfolk.

Harrods power-station is 90 years old. Harrods store, located in the Knightsbridge area of central London, has 240 different departments, and proudly claims to be able to supply anything from a pin to an elephant. There are some 5000 employees on the 1.82 hectare site, and the store's annual turnover is close to £140 million. Harrods started as a grocery concern in 1849, and has had its own power station since 1890. The present building was erected in 1901, and the main power station beneath the store was commissioned in 1908, with Lancashire boilers and six Willans steam engines driving d.c. generators with a total electrical output of 960 kW. At this time the total electrical consumption of the store was 1.1 million units (kWh), but by 1920 the consumption had risen to nearly 2.5 million units. (It is currently in the region of 20 million units).

In 1921 the first diesel generating set was installed in new workshops at Trevor Square, below the Harrods warehouse: this workshop is about 400m north of the main plant room.



Gunton Park Sawmill

This first diesel set was built by Mirrlees, Bickerton & Day, and comprised a six-cylinder engine driving a 200 kW d.c. generator at 250 r/min. Over the next seven years, five more such sets were installed, and each engine fed a waste-heat boiler which provided water at 71°C to supplement the store's heating systems.

After World War II, it was decided to convert to a.c. power with on-site generation at 3.3 kV, use of mains (grid) power coming in at 6.6 kV, and distribution at 415V. The six Mirrlees sets in the Trevor Square plant room could not be converted to a.c., so they were replaced between 1950 and 1952 by six English Electric RK-series Mk.1 eight Cylinder diesel sets, with 300 kW alternators and running at 600 r/min.

By 1974 it was apparent that the English Electric Mk.1 sets in the Trevor Square plant room would soon have to be replaced by newer, more efficient units, all having run for some 60 000 hours by then.

In 1976 for security of electrical power, as well as economy, it was decided to install a new generating plant and three new sets were ordered from W H Allen (now APE-Allen) of Bedford, with Allen 6BCS12DX six-cylinder turbocharged and charge-cooled diesels of 694 kW (930 hp) brake power rating, driving Brush 650 kW, 812 kVA, 3.3 kV alternators at 750 r/min. The first Allen/Brush set was installed in December 1977, the second was commissioned in November 1978, and the third went into service in June of last year.

The AIA is grateful to 'The Notched Ingot' for permission to reproduce the above.

Measuring and **Recording,** is this one of your problems. Surveying buildings, structures and machinery can be difficult but, judging by the number of drawings which never get done, putting pencil to paper afterwards is even more difficult. Bert Dance, one time Consulting Engineer/HMI/College Director, now retired and living near Bristol has made a long term study of the difficulties of producing three dimensional drawings, and in particular those which, being drawn to a definite scale, can be remeasured.

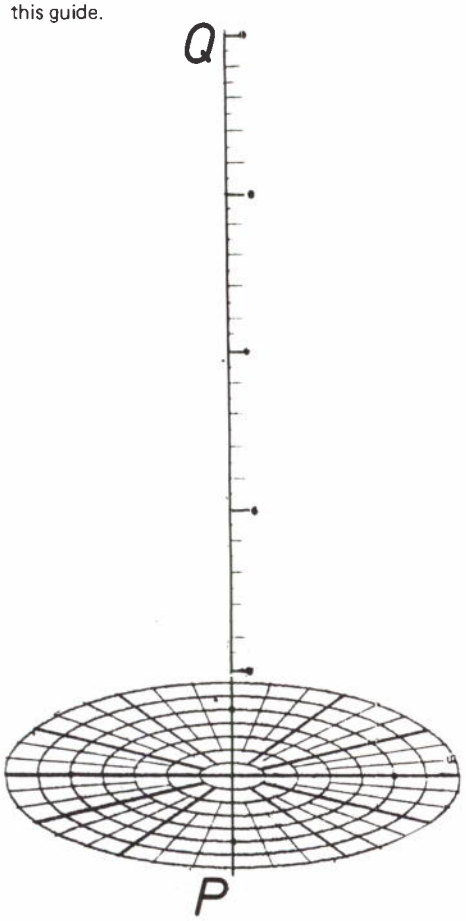
He has devised the **Axoplan Method of Pictorial Sketching** which he thinks would be of help to industrial archaeologists in the field. The following notes are his, as are the drawings, and he would welcome enquiries to HE Dance, Simon's Cottage, Burrington, Avon, BS18 7AA.

THE SPIRAL STAIRCASE It might seem that this is a surprising choice for the first example of a system of sketching, but it brings out in a single picture the several good features of the axoplan system, and of good practice in field sketching.

In the Axoplan Method we take an axo-metric picture of an array suitable for the object. In this case the array is a set of con-centric circles with radial lines at 10° intervals. In the axometric view the circles become ellipses and the angles are changed. At right angles to the array we have a scale which in this example is on a line PQ through the centre of the circles.

The array and the scale together constitute a ***SPACE GUIDE.*** In a further note we shall show how to make a space guide, in the meantime we accept it.

The circles appear to be tilted to that in this example the ratio of the minor to major axes of the ellipse is 0.4 which is the tilt ratio for this guide.

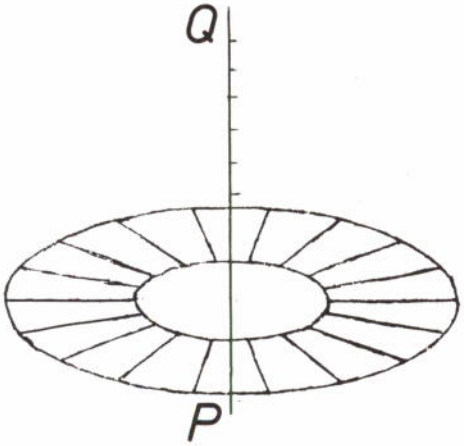


The vertical scale is contracted to match the tilt.

The essential part of a stair is the tread - the part on which you step. The height of one step above the previous one is the rise.

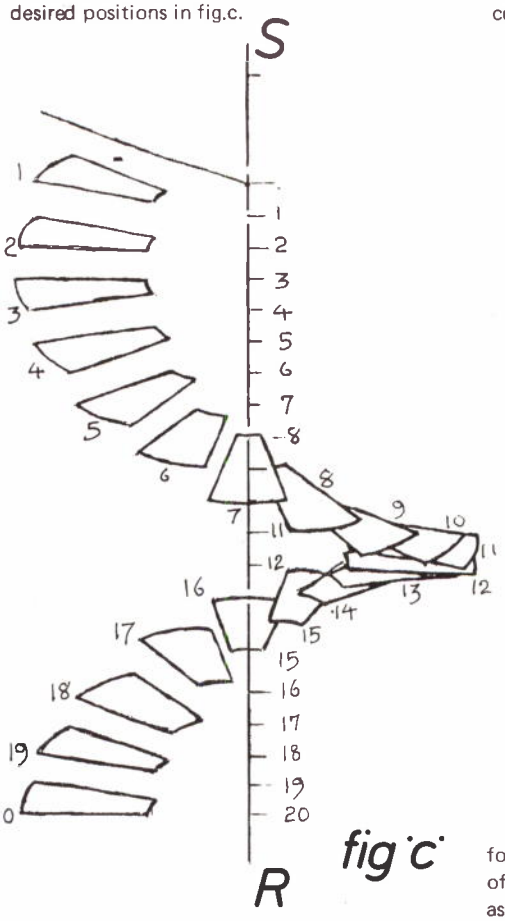
In sketching it is well to show the essentials first and then show no more than is necessary. So we begin by tracing the plan of the treads. We choose a scale of 150mm per division, and a tread length of 4.0 divisions, and 20° wide. There are 18 treads in the complete turn. You may add the vertical scale with the rises marked on it if you wish or you may work directly from the space guide.

The axoplan of the treads looks like this.



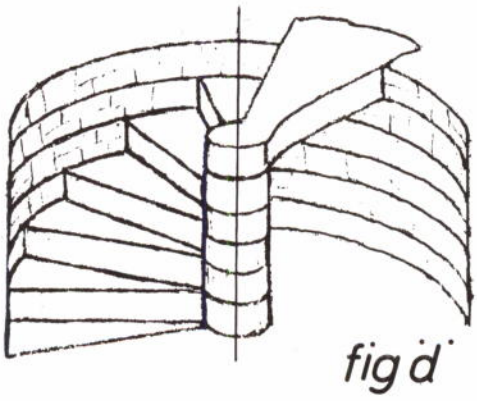
THE MOVING TRACING Take a sheet of tracing paper and draw on it a locating line ***RS*** which in this example is always kept in register with the scale and direction line ***PQ.***

Mark on ***RS*** the levels at which each item from the space guide is to appear. These marks are brought one by one into register with the major axis of the ellipses on the space guide and the item traced. The treads are seen in their desired positions in fig.c.



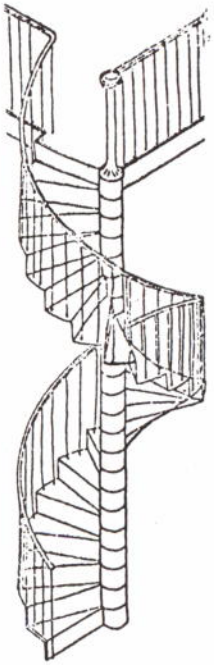
If the treads shown in fig.c would bear your weight you could walk up them but you would not get planning permission with this sketch because there is nothing to show that they will not collapse, there is no guard to prevent you from falling off them and no information about where they lead to and from so that their safety in case of fire or panic cannot be judged.

In fig.d we have shown the same treads in the tower of a mediaeval castle. The steps are built into the walls and supported by a central column which is part of them and built up with them. The walls and column enclose the stair.



An alternative to supporting the steps by a central column is to cantilever them from the wall and also to overlap them slightly so that the vertical load is transmitted to the ground partly directly and partly to the wall by torsion of the steps.

This arrangement has the advantage of leaving the centre of the tower free for vertical lifting or for other features such as a central well.



With the development of economical iron founding it became possible to cast step units of standard dimensions which could be assembled to form a partly self supporting staircase.

To draw the hand rail for the staircases of figs.c and d decide the height of the hand rail then use the same set of locating marks as for the steps but make a locating mark displaced by the rail height.

EXCHANGE AND MART. A 12 h.p. single cylinder Crossley gas engine, complete with gas producer plant, is available to any museum able to accommodate and work it. The engine is thought to date from the mid 1920's. Enquiries to Ray Bellchambers, Stacey Hill Collection of Industry and Rural Life, Stacey Hill Farm, Wolverton, Milton Keynes MK12 5EJ.

A large industrial museum cleaner with twin-cylinder suction pump is available for purchase by any interested collector. It is described as in perfect condition. Phone Stratford on Avon 292607 for details.

Offers are invited for a Columbian Eagle flatbed printing press, believed to date from 1850 and in fully restored condition. For further information, telephone Sheffield (0742) 584692.

The triple-expansion pumping engine ***LIVENS*** formerly at Elkesley Pumping Station (see Bulletins 4:6 and 6:3) will not, after all, be re-erected at the Welsh Industrial and Maritime Museum in Cardiff. Following a review of that Museum's collecting policy the engine which stands 50 ft high and about 40 ft long, is available for removal to another museum which can re-erect it. The total weight of the engine is about 180 tonnes, and potential owners would have to supply transport and craneage

to remove it from the Museum site in Cardiff. Enquiries to Dr E.S, Owen-Jones, Welsh Industrial and Maritime Museum, Bute Street, Cardiff, Tel,0222 371805.

SATANIC MILLS' COURSE at ILKLEY COLLEGE April 1980 arranged by 'SAVE' for the Victorian Society was introduced on the Friday evening by Dr D. Wright of Huddersfield Polytechnic who spoke on the 'Golden Age of the Textile Trade'.

On Saturday morning, as a prelude to mill visits in the Bradford and Halifax area, Mr. J. Roberts gave a lecture on the 'Architecture of Industry and Commerce in Bradford'. The shape of the town had been influenced by the course of the river running west and north, by the exploitation of the ironstone beds and accompanying cheap coal and by linear development along the two highways westgate and Kirkgate. A study of a 10 ins to the mile map of C 1840 indicates that Thornton Rd and the Bowling beck were the industrial areas. The small woollen warehouses that had developed were constructed with wooden floors and joists and cast-iron support columns. In later examples, an eliptical laminated roof truss was found. The entrance for customers was on the corner of the quadrant plan layout. (Bradfords mills were primarily worsted spinning for first few decades with the Britannia mills spinning alpaca and mohair and Ripley's Bowling dyeworks treating a mixed cloth). Wool staplers' warehouses had been plain but there followed the development of the area known as 'Little Germany' from the 1850s. where men such as Salt employed architects such as Lockwood and Mawson for their 'home-trade' warehouses. These were establishments for finished goods to sell to drapers of which the principal floor was at ground level. Another type was the shipping warehouse from which merchants placed orders with manufacturers and arranged for the finishing process - here the first floor was the main room.

In the 1880's however, colonial wool combing became the dominant activity and most warehouses became wool warehouses. These later types were 80-95 ft high with central loading doors and a prominent cornice. Later in the day, Mr Roberts conducted the party on a walk around the area of 'Little Germany', but the main activities of the day were devoted to visits to two important Textile Establishments:

Lister's Manningham Mills, Bradford

Designed 1871-73 by the local firm of Andrews and Pepper (Thomas Garlick Andrews 1838-1881, the son and successor of W A Andrews, a railway architect of the N and E Ridings, and yet another pupil of P F Robinson) for Samuel Cunliffe Lister, later Lord Masham, and in terms of size, date and architectural treatment, the apotheosis to the great mill building boom of the previous 25 years. The building, on the site of an earlier Lister family mill (1838) destroyed by fire in 1871, covers 18 acres, contains 22 acres of floorspace, and extends on the Heaton frontage for more than a quarter of a mile.

'Having lost the old works by fire .... the mills were absolutely fireproof. The two enormous six storeyed structures are constructed with floors arched in concrete upon cast iron girders on the well known system. All the window frames .... and massiveness and substantiality and the frontage is one of the finest pieces of rendering extinct. Care was taken that different departments should have separate access from the surrounding streets .... The dominant feature, of course is the great chimney .... the most remarkable structure of its kind architecturally in the country. The design is based on the well known Italian campanile - 250 ft high, and 20 ft square. The total weight is 8,000 tons and its cost £10,000. Externally it is a highly ornamental square shaft, without batter, with recessed panels, and two tiers of cornice. The style of whole works is Italian, very boldly treated.' Bradford Observer.

Picture: Neil Cossons

Manningham Mills

The mill was designed for plush and velvet weaving, Lister converting the previously unusable silk waste, and introducing into Britain the double velvet loom, giving the firm an unbeatable monopoly in furnishing fabrics. Today, the two principal activities are still carried on in the single storey rooms by the successor company, plus some Worsted weaving, but the tall spinning blocks although cleaned scheduled and maintained are standing empty - a new factory at Barrow-in-Furness having replaced the former process.

Dean Clough Mills (Halifax). John, Joseph and Francis Crossley were the three sons of John Crossley, who leased (and later bought) a mill here in 1822. This was a three storey six-bay building, and Crossley lived in a house attached. This was the small-scale beginning of a business which was to become a joint-stock company in 1864 with a capital of £1,650,000, employing 5,000 people in a works which covered 18 acres. The Crossley brothers pioneered power production of carpets. John Crossley was a great public figure, Mayor and MP, while Joseph (1813 - 68) devoted himself to the business. Frank Crossley (1817-72) was described as 'the bold projector in the firm; his was the far-seeing eye, and his the determined will; he estimated possibilities and calculated probabilities, on which he made his decisions, and he had the fearless will to carry out these decisions when to others they seemed visionary'.

He was a staunch dissenter and Liberal, and a generous philanthropist, giving away over £150,000. He became a baronet in 1863 and retired to Somerleyton Hall, Suffolk, where the Crossleys remain.

The present Dean Clough Mills consists of a variety of buildings erected for the Crossleys over a considerable period, together with some blocks originally used by the Akroyd firm. The earliest blocks remaining on the site are the 'A' and 'B' blocks, respectively built in 1842 and 1847, in effect a single, huge range of buildings stretching along the narrow Old Lane. The construction of these buildings is of timber with cast-iron columns. This block was continued westwards in 1858, probably to the design of Roger Ives of Halifax. At right angles are the 'C' and 'D' blocks of 1859, with a prominent water-tower. 'E' and 'F' blocks were built in 1854, 'H' and 'I' in 1857. These later blocks, probably also by Ives, are more architectural in treatment: the water towers are made to resemble Italian campanili. The 1857 block on the south side of Dean Clough is similar and again may be by Ives. At the east end of the site is Bowling Dyke Mills, built 1849-51 on fireproof principles (engineers: Hewes and Wren of Manchester) for the Akroyd company, whose Haley Hill Mills stands above to the north. (The buildings were acquired by the Crossley company only in recent years). The gigantic chimney at the west end of the complex was built in 1857. It is nearly 300 feet high and is crowned with cast-iron plates, the last chimney of this type left in the town. It is one of the finest chimneys in the North.

Although Dean Clough Mills is still very much in use, production methods have changed and the majority of the multi-storey blocks are now empty. None of the buildings is listed and some of them must be regarded as under threat.

References A D George

1 The West Yorkshire Wool Textile Mill **Industrial Archaeology Vol 14 No.2**

2 **Satanic Mills** booklet RIBA 1978

3 **Lister and Co. Ltd.** reprinted from Chamber of Commerce Journal (Bradford and Calderdale 1979

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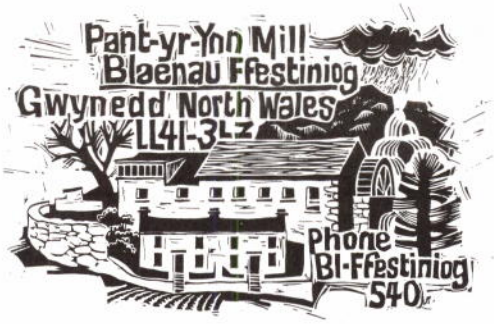

Pant-yr-Ynn mill is the home and work place of Falcon Hildred an industrial designer who has spent much of the last ten years building up a pictorial record of British industrial towns. The result is the Worktown Collection of drawings in which there are now over 120 works, ranging from site sketches to minutely detailed and coloured studies. These record not only the fabric of buildings and streets, but also the kind of life that went on within and around them, and the atmosphere which all this generated. There are pictures of corner shops, coal being delivered, factory chimneys, the interior of a quarryman's dwelling and slums in the snow.

Practically everything which Falcon has recorded has now disappeared, and so his drawings are becoming a valuable source of reference. For this reason none of them are for sale. The Collection has therefore been formed into a travelling exhibition, and prints made of the more popular subjects. These range from postcards to signed and hand-coloured limited editions, and they are available at the exhibition or direct from Falcon Hildred.

Prints as presents

He selects all his own subject matter, and finances the work himself. He hopes that print sales and commissions will eventually provide a sufficient level of income for the research to go ahead full time, and the Collection to be established in a permanent home.

A DRINK FOR IT'S TIME. Farm Cider Making in the Western Counties *Michael Quinion, Hereford Cider Museum Trust, Ryelands Street, Hereford HR4 0LE, 1979.* First publication from the new Museum of Cider, written by its first Curator. The recent revival in 'real ale' has sparked a corresponding interest in farmhouse cider although the making of it virtually dried out by the middle of this century and is unlikely to revive. This 24-page booklet with 30 old photographs described farm cider making as practised in Herefordshire and neighbouring counties around the turn of this century. Brief and compressed, it is an appetising foretaste of the new museum due to open in 1981.

'The Building of an Industrial Community - Coalbrookdale and Ironbridge' *W Grant Muter Phillimore, £7.50.* This book is in many ways an invitation to stray from the well-worn path of the visitor touring the main museum sites in Ironbridge and Coalbrookdale. Ironbridge presents a remarkable assemblage of buildings, often clinging close to the side of the Gorge and reflecting a period of prosperity following the building of the first iron bridge in the world. Coalbrookdale is much more than the remains of an ironworks for a great deal has survived in the form of chruches, chapels, schools and houses of all kinds from the heyday of this remarkable community and it is these buildings, their materials, construction and architectural details which form the basis of Grant Muter's book. There is a short chapter on terraced housing illustrated with plans and elevations revealing the layout of rows such as Carpenter's Row built in the 1780's by the Coalbrookdale Company. The book's text of some 70 pages is amplified by over 100 black and white photographs mainly taken by the Author.

GIRO ACCOUNT. We are happy to announce that the Association now has opened a Giro Account number 48 174 4002 and members who wish to pay their subscriptions in this way may do so.

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ISSN 0309–0051.