

Pause for thought!

Every so often we are asked 'How is IA doing? is interest on the wane? or is the whole thing becoming played out? It is tempting to expect 'peaks' at regular intervals and if these seem thinner on the ground than was once the case, to assume that monotony has set in and that the end is nigh.

But if one actually does pause for thought, stop to look beneath the more obvious 'surface' it can be quite heartening to see what is going on.

This month the Association for Industrial Archaeology is sending to those forty plus societies who have become affiliated to it, a Directory of local societies and kindred organisations.

This contains 21 pages of names and addresses (about 7 to a page) and gives details of some 150 organisations who feel that IA is a worthwhile thing. Our researches indicate that **most** local societies do not contain very many individual AIA members and so adding these two classes of IA followers together, there are at a very conservative estimate around 6,000 'official industrial archaeologists' at large.

Add to this those who attend University Extra-Mural, WEA or LEA IA courses (but who will possibly never join a society), and the vast multitude who are quite easily persuaded to watch Anthony Burton or Kenneth Hudson on the 'tele' and at any one time industrial archaeology has a supporters club of around 100,000. Compare this with a few years back.

Despite soaring costs . . . and the humble local authority evening class is no longer the bargain it was in the 1960s and early 1970s . . . attendance at organised lectures is holding its own remarkably well.

The University of Bristol Department of Extra-Mural Studies has just started its 14th series of IA Winter Lectures with a predictably increased course fee. Despite a 700% increase in this fee over a period of 10 years (it is now £12.00 for 12 lectures) attendance is two and a half times greater than it was in 1972 and stands at a very satisfactory register level of 52. Admittedly this is a bit below the 1977/78 totals of 75 fee paying members but then the price was a mere £3.80 and unemployment and short-time working was a threat rather than a reality.

So we have every reason to feel satisfied at the 'grass-roots' support for a subject which most

of us find difficulty in defining, but that is another discussion.

New look for the Old Furnace. A little over a year ago (*Bulletin 8/3*) we reported that the historic Old Furnace at Coalbrookdale was to be protected from further deterioration by the provision of a 'cover building'. This has now been completed and was officially opened by HRH The Duke of Gloucester in July 1982. The following account, together with two other interesting items, is taken from the Newsletter of the Friends of the Ironbridge Gorge Museum, by kind permission of the Editor, Barrie Trinder.

Old Furnace Building Opened. On Tuesday 27 July HRH the Duke of Gloucester visited Ironbridge to open the Old Furnace Building at Coalbrookdale. After arriving by air at RAF Shawbury, His Royal Highness paid brief visits to the Blists Hill Open Air Museum and

to Telford Development Corporation's re-development scheme at Jockey Bank before performing the opening ceremony at the Old Furnace Building. It was in the Old Furnace, Coalbrookdale, that Abraham Darby I first successfully smelted iron with coke in 1709. The furnace was enlarged by Darby's grandson in 1777 to produce iron for the ribs of the Iron Bridge, and it remained in blast until 1818, after which it was incorporated in a complex of foundry buildings. In 1959 it was excavated and consolidated by Allied Ironfounders Ltd at the same time that the adjacent Coalbrookdale Works Museum was set up. The Museum and the furnace were handed over to the Ironbridge Gorge Museum Trust in 1970. The modern cover building has been constructed to prevent the continuing deterioration of the structure. Finance for the project was provided by the National Heritage Memorial Fund, the National Coal Board, the Department of the Environment



the Manpower Services Commission and the Ironbridge Gorge Museum Development Trust. Work began on the building in the summer of 1981, and the first visitors were admitted in the spring of 1982.

Old Furnace enigma Solved. The meaning of the inscription cast on the oldest of the beams of the Old Furnace at Coalbrookdale has long been a mystery. The date now appears as 1638, but old photographs taken before the beam was exposed to the weather in 1959 show that it was then thought to be 1658. The latter date could make rather better sense since there is no documentary evidence that there was a blast furnace at Coalbrookdale before the Civil War. The lettering on the furnace is similarly confusing. It has been suggested that the 'B' may refer to the Brooke family, lords of the manor of Madeley, but the nineteenth century local historian John Randall thought that the beam had been brought to Coalbrookdale from the furnace at nearby Leighton, in which case the 'B' could equally well have referred to the Boycott family who were closely associated with the works.

Professor K J Holtgen of the Institute for English and American Studies at the University of Erlangen, Nurnberg, who recently visited Ironbridge, has put forward an explanation of the inscription which seems thoroughly credible, and has important implications for the history of the ironworks. The inscription actually reads:



Professor Holtgen suggests that the 'B' with the wavy line is a *rebus* (ie an enigmatical representation of a name or thing, using figures or pictures instead of words or parts of words). It indicates a 'B' and a brook. The crown is a rebus for Basil, meaning a king. The 'E' stands for Etheldreda, daughter and heiress of Sir Edmund Brudenell of Deene, Northamptonshire, whom Sir Basil Brooke had married in 1605. The inscription therefore reads:

Brooke, Etheldreda (and) Basil
1638 Etheldreda (and) Basil Brooke.

This is an explanation which seems entirely acceptable. It confirms the date of the structure, for whatever ambiguities there may be in the reading of the letters, the Brooke family were dispossessed of the ironworks during the Interregnum and could not have built the furnace in 1658. It must however remain a possibility that the beam when first used was part of the Brooke family's steelworks, rather than of a blast furnace. Professor Holtgen's explanation seems finally to dispose of John Randall's association of the beam with the Leighton furnace. It is most gratifying that in the year when the furnace has been preserved in a cover building, one of its outstanding mysteries should have been solved.

Old Furnace recorded. A full record of the archaeological excavations carried out at the Old Furnace during and after the construction of the cover building is now available at the Museum. It includes a full set of measured

drawings of the structure, and is entitled *Archaeological Recording at the Old Furnace, Coalbrookdale, 1981-82*. It was compiled by John Malam, Archaeological Supervisor at the Institute of Industrial Archaeology.

Old Furnace Wheel revealed. Almost every industrial archaeologist or engineer who has visited the Old Furnace, Coalbrookdale, has speculated about the siting of the water wheel which operated its bellows. During the final stage of clearance work on the furnace prior to the opening of the cover building, some marks on the stone work on the west side (which must have been visible since 1959) were noticed by Bob Wilhelm of the University of West Virginia, who spent the academic year 1981-82 in Ironbridge. Removal of a little more soil established that these score marks were indeed made by a waterwheel, of approx 2.25m radius.

The Gold Mine Museum, Johannesburg One of the tourist attractions in Johannesburg is the Gold Mine Museum, centred around the No 14 shaft of Crown Mines. Visitors to the museum may learn, in a special display, something of the geology which gave rise to the prosperous gold mining activity on which the wealth of Johannesburg was founded, and they can walk through re-assembled company housing furnished in the style of the turn of the century. There is a large model of the surface buildings at a mine, which explains the whole process of ore treatment, and a melt shop where an audience

supplying air into the workings. It has two cages in separate compartments worked by the original steam-driven winding engine. Nowadays visitors are taken by a guide along the number 5 level, where various displays of equipment, old and new have been arranged. One of the more impressive moments comes when the guide asks visitors to turn off their lamps, and a worker up in one of the stopes demonstrates the old method of hand-drilling using a hammer and drill steel, working by the light of a single candle.

One of the miscellaneous items of equipment mounted in the museum grounds is an 'air calibrating machine' As a nearby notice explains, this was originally installed at the Ferreira Deep Mine in 1904, when the mines purchased bulk compressed air from the old Victoria Falls and Transvaal Power Company (later to be incorporated into South Africa's national electricity supply company, ESCOM).

The bulk suppliers fed compressed air into a main which served Consolidated Main Reef, City Deep and Crown Mines. To ensure they were getting what they were paying for, the mines decided to install a system to measure the quantity of air they consumed. A machine to measure the air was designed by engineers at the Rand Mines, who sent the drawings overseas to Fraser and Chalmers, of Erith, Kent (now incorporated in part of the GEC group as GEC Mechanical Handling). The completed mechanism was shipped out to the Reef and erected, where it obviously served its purpose successfully for



Headframe of No 14 shaft, Crown Mines Museum.

may sit and watch a standard gold brick being poured.

The highlight of any visit is a trip underground. Visitors are kitted out with overalls, safety helmets and cap lamps prior to descending the No 14 shaft to the No 5 level, at a depth of 220 metres. The circular brick-lined shaft was completed in 1918 and is actually over 1000 metres deep. Supplementary shafts elsewhere in the mine carried the former workings down to a total depth of 2000 metres. All ore from the mine used to be hoisted up Crown Mines No 5 shaft, situated about 2 kilometres north of the museum.

The No 14 shaft was used for hoisting men and materials, and as a ventilation shaft,

many years.

Tony Bewis
Mining Magazine

Flying Boats. The Sandringham flying boat *Southern Cross* is being restored at HMS Daedalus, Lee-on-Solent.

The *Southern Cross*, built in 1943 at Short Bros' Rochester works as a Sunderland MK III, with Bristol Pegasus XVIII engines. It did not serve in the RAF but was held in reserve at Wig Bay. After the war it was taxied across the Irish Sea to Short's works at Queens Island, Belfast, to be rebuilt as a Sandringham Mk IV, the engines being replaced by American Pratt & Whitney Twin Wasp R-1830-90C

engines. The craft went to Tasman Empire Airways Ltd, where it was known as a Dominion Class flying boat (later Tasman Class), being delivered in 1947 as ZK-AMH names 'Auckland'. In 1949 it was sold to Barrier Reef Airways with the Australian registration VH-BRC, and in 1952 to Ansett's, working with Excalibur on the Sydney-Lord Howe service, when it was known as 'Beachcomber'. It was sold to Antilles Air Boats in 1974 to carry inter-island passengers in the Virgin Islands, being re-named 'Southern Cross' with the American registration N158C. Two trips were made to England when Captain Charles Blair piloted it and passenger trips were made. After his death the airline lost interest in its flying boats and it lay derelict at Puerto Rico. It would have been scrapped had it not been for Capt Ron Gillies, who flew it for 28 years. He set about rescuing it and after a series of problems it eventually arrived at Calshot on February 2nd, 1981.

The aim was to fully restore the flying boat and take passengers for a few years until retiring it to a museum. The facilities at Calshot were limited and 'Southern Cross' was moved to HMS Daedalus in July 1981. However, funds were nowhere near target and the Science Museum stepped in and bought it. The volunteers were given until September 1982 to complete the work, or it would be taken to the museum's annexe at Wroughton, near Swindon.

The possibility of it ever flying again is almost nil, not only through lack of cash but

for November 1812 states that 'The new sewer now excavating in Hyde Park is one of the greatest works of the kind ever attempted in this country. It is intended for a drain to the numerous streets now built in the neighbourhood of Paddington, and will empty itself into the great sewer which enters the Thames at Millbank. In consequence of the height of the ground in Hyde Park, it became necessary in order to ensure a sufficient fall to this new sewer, to dig to a very great depth; and its formation is carried on by the laborious and expensive process of tunnelling. Pits are sunk at the distance of every seventy yards, and the excavations are conducted in a way similar to those in a coal-mine. The stratum of clay through which the sewer passes is favourable to the process of excavation, and is similar to that which was thrown up in the formation of the Highgate Archway, which so suddenly failed on nearly arriving at completion. The gravel pits in Hyde Park are filling up with the clay dug from the tunnel'. Is the tunnel, of the order of two miles in length still in existence? Is anything further known about how and by whom it was made?

The reference to the failure at Highgate Archway concerns an even earlier tunnel through the London Clay, made in 1808-09 where the new by-pass road was carried on by a tunnel through the hill for a distance of about three hundred yards. . . This great undertaking was completed in the latter part of 1809, and the tunnel, 24 feet high and 22

claim to be England's earliest surviving road tunnel, as the collapsed one at Highgate was widened out to an open cutting, Hornsey Lane being carried over by the famous archway.

Although extensive and deep tunnelling, with or without working shafts was by this time a well-established technique in mines and canals in the hillier parts of Britain, the development of tunnelling techniques in the softer and more mobile rocks of the south-east called for the development of new skills. Were these London and south-eastern tunnels the work of contractors who already had tunnelling experience in more favourable rocks further north and west?

Between 1807 and 1809 the civil engineering contracting partnership of William John Jolliffe and Edward Banks (1807-32) was responsible for the making of an ambitious drainage adit for an underground stone quarry at Merstham in Surrey. Although tantalizingly little is recorded about this structure, it appears to have been of the order of 500 or so yards long, made inclined gently upwards through Gault Clay without so far as is known any intermediate working shafts, so as to de-water a flooded underground quarry. Jolliffe's training was as a curate, but Banks was a Yorkshireman with considerable civil engineering experience behind him by this date, who had been concerned amongst other works with the 3/4 mile Marsden tunnel under Standedge. Interestingly, the partnership undertook some work, believed to be trial borings for Marc

The Fraser and Chalmers 'Air Calibrating Machine'.

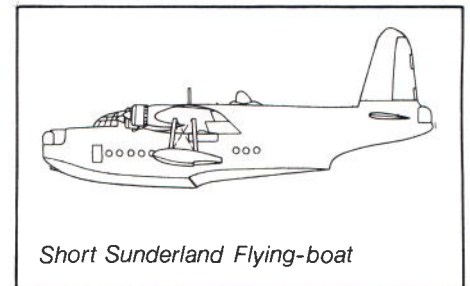


also a lack of volunteers. The latest development concerns its eventual resting place, as Southampton's Mitchell Museum, which is to be relocated in a new building near the Itchen Bridge, has been suggested by the restoration group. And a flying boat is not exactly a small item, so this would involve a much larger building than originally planned with an equally larger cost - £120,000 instead of £70,000. A third 'bid' for display has come from Rochester, where it was built. The decision on its future is expected soon.

Southampton University IA Group

Early Tunnelling in Clay. The Monthly Magazine

feet wide, was arched with brick but on the morning of 13 April 1812 some of the brick-work gave way. About noon the ground above the tunnel was seen to crack and settle, and during that and the following day the whole arch, which had been carried for a distance of 130 yards, fell in. Not a single person was injured, although on the preceding Sunday several hundred people had visited the works out of curiosity'. I am indebted to Stephen Croad of the National Monuments Record for this reference (from H P Clunn's **The Face of London**, 1951, in response to my enquiry in an earlier AIA Bulletin about early road tunnels. Although not the earliest constructed that of 1823 at Reigate (through sand) still has a



Short Sunderland Flying-boat

Brunel in connection with the making of his Thames Tunnel in 1824-42 (the contract was worth £486.) Whether the 'North Hyde Works' (for £931) for which they are also known to have been responsible had any connection with the Hyde Park Sewer is not known.

Paul W Sowan

IA News from Sussex. The following two items are reproduced from Sussex IA Society Newsletter 35, July 1982.

The Glynde Telpher Line. Two members of Sussex IA Society, R F Jones and E W O'Shea, have produced information about the Glynde Telpher Line, and found relevant articles Mr E F Carter in *'Design and Components in Engineering'* for October 6th, 1971.

It appears that a Dungeness man, Professor H Fleming-Jenkin first used electricity for operating such a telpher line and in 1883 an experimental line 700 ft long was built near Baldock, Herts, followed by a similar installation at Millwall Docks in 1884. The first commercial installation, however, was that at Glynde opened in 1885 and which ran for over a mile from rail sidings at Glynde station to pits in the gault clay on the estate of Lord Hampden, then Speaker of the House of Commons. The skips ran at 5 mph on steel rods forming 'up'

and 'down' tracks supported 18 ft above ground on T-shaped structures at intervals of 66 ft. Details of the electric drive and control arrangements are somewhat vague but it was possible to handle 300 tons of clay per week.

Mr O'Shea has a photostat copy of the programme for the opening ceremony, dated October 17th, 1885. This is a beautiful piece of Victoriana with 30 different type faces in 39 lines of print! Mr O'Shea has permission from Mrs Joyce Crow, the Hon Librarian of Barbican House, Lewes, to make further copies which will be available to any interested members at cost (25p).

Brighton's Electrical Power Supply 1882-1905.

Early electrical power development was bedevilled by poor legislation, the Electric Lighting Acts of 1882 and 1888. One result was a rather tedious battle between municipal and private enterprise. Brighton Corporation was no exception and after some vacillation set out in 1890, to attempt to capture this lucrative new market by building their own power station in North Road, almost opposite Reed's Iron Foundry. Alarmed by this competitive threat, the Brighton and Hove Electric Light Company responded by notifying its customers that they must sign a 3 year contract for supply or be cut off. Although three quarters of the company's customers signed, the measure was only of temporary assistance as on the 2nd April 1894 in the face of increasing competition the company was taken over by the Corporation and paid £5000 for the goodwill of their business. Arthur Wright, the generating station manager and engineer, became the municipal concern's Station Superintendent.

The municipal power station opened in 1891 and inconveniently chose direct current which Wright had abandoned 3 years earlier. The original plant consisted of 3 coal-fired Lancashire boilers (7 ft dia x 27 ft long) operating at 150 lb/in² and 4 Williams-Gooden generating sets. It must have been hard and thirsty work in the power station as a local publican was allowed in three times a day to take orders for beer, tobacco, fish and chips. By 1904 the generating station had considerably expanded, taking in adjoining properties in North Road and Bread Street and having 6 Lancashire boilers, 10 Babcock and Wilcox boilers, 15 Williams and Robinsons engines direct coupled to 15 dynamos made by Electric Construction Company and Bruce Peebles generating at 115, 230, 460 and 550 volts, feeding a network of 70 miles of street cables.

By 1899 it had become clear that in order to meet the anticipated demand which had increased from 867,494 units in 1895 to 4 million units by the end of 1899 a new station would have to be built and a 10 acre site on the eastern arm of Shoreham Harbour at Southwick was purchased. Arthur Wright was appointed Consulting Engineer and construction began in 1902. The station was officially opened on 16th June 1906 and allowed the North Road plant to be closed as a generating station in 1908; although it is still being used as a sub-station (if one climbs to the highest level of the multi-storey car park at the top of North Road the brick base of the boiler house chimney can still be seen).

Brighton Corporation was a large user of the electricity it produced. Until 1906 it ran one of the few municipal telephone systems in Great Britain (selling out in that year to the

GPO for £49,000). From 1901-1939 municipal trams were operated on a 3ft 6 inch gauge and pioneer trolleybus experiments with a rather hefty 40 seater, which trundled along Preston Road, were carried out in the winter of 1913-14. The well-loved red and cream trolley buses taking over from the trams in 1939.

J S F Blackwell

Thwaite Mills, Near Leeds, a review of a vintage year: 1981.

The year started well with the first grant offer from the Department of the Environment of some £7,000 towards the cost of roof repairs and the purchase of scaffolding and materials. The Department of the Environment letter offering grant referred to the Mills as a 'remarkable survival'... 'the mills contain a very rare, if not unique collection of waterpowered equipment for the manufacture of putty and whiting'. Despite this, the provision of long term access to the mill was under discussion because of the plan by the British Waterways Board to widen the canal immediately adjacent to the Mill thus destroying the present road bridge.

Early in 1981 the carpentry section of the MSC project was approved and the workforce to date largely recruited from the Hunslet/Belle Isle/Middleton area consists of a Senior Supervisor, three Supervisors (Building, Engineering and Carpentry) and 20 labourers.

A great deal of work was accomplished — much of it now unseen, as for example the

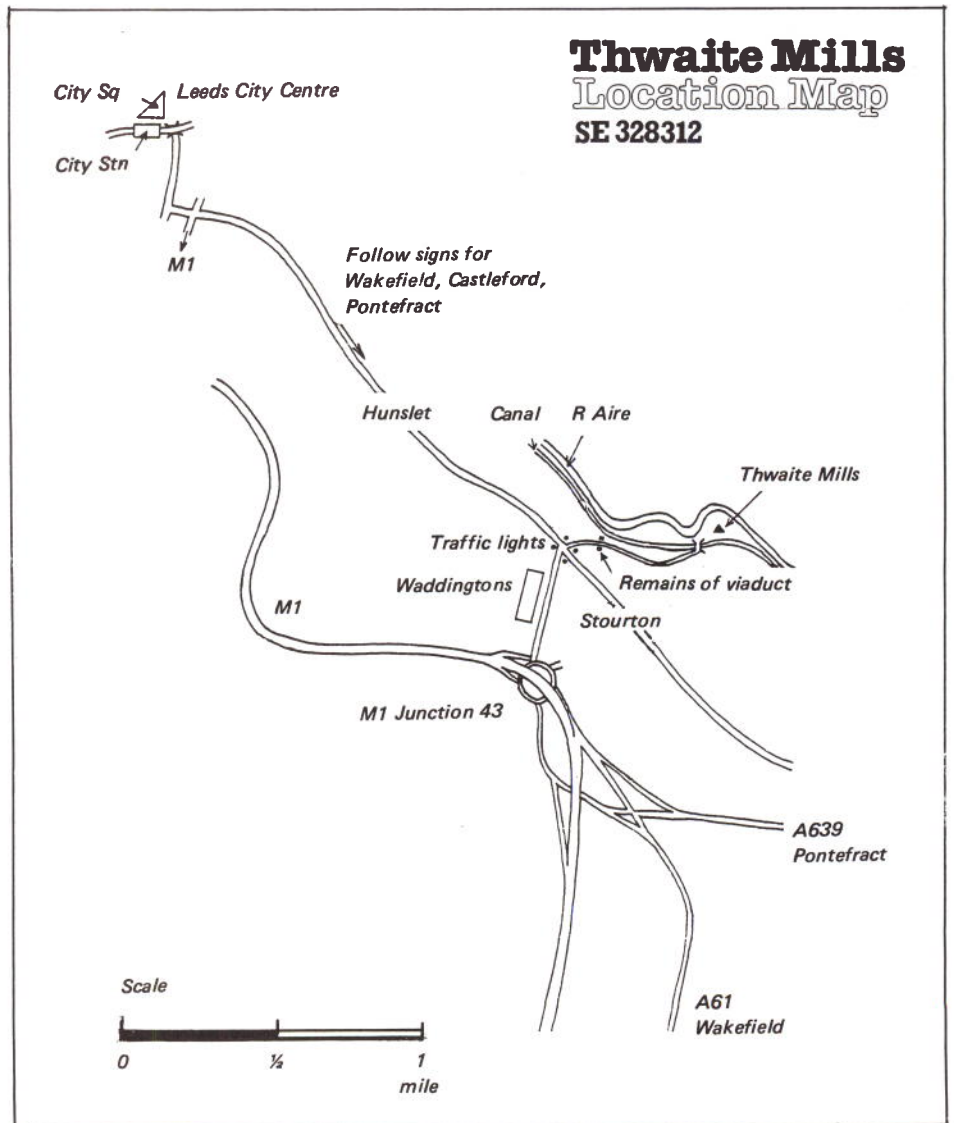
reconstruction of the masonry tunnel water outlet from the main water wheel. A considerable area of stone setts were laid, diesels stripped, repaired and re-assembled, a new 240 volt generator fitted, the house almost rebuilt from roof to cellars. As part of the restoration programme the Mill race was dredged vastly improving the visual impact of the mills surroundings.

In the Engineers shop drilling and grinding machines were stripped and painted, two lathes repaired, the forge and its blower brought to working order.

A comprehensive programme of building and carpentry was followed — all internal windows and doors being replaced in the mill house, brickwork pointed and stonework replaced. The garden wall was reconstructed. Throughout the mill sills and lintels are being replaced. Drainage from house and mills has been improved.

MSC support for 1982 was confirmed and an enlargement of the programme to include specialist groups for painting and decorating, landscaping and technical activities is confidently anticipated. DoE has offered grant towards the cost of materials to a maximum of £10,663. The County Council gave grant in support of the scheme of £5 000 in 1981/82 and £25 000 in 1982/83. The County Council also now sponsor the Community Enterprise Programme.

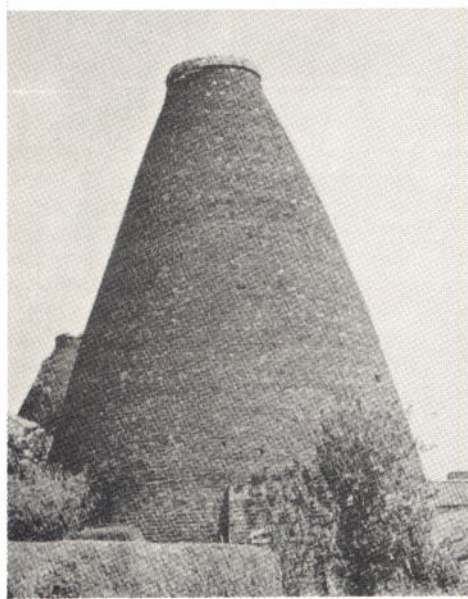
Of the many visitors to the site the Inland Waterways Association rally in August 1981



produced a flood of enthusiasts. The interest shown by the Association's members and their guests demonstrated the considerable appeal of the Mills which has been echoed many times by other groups and individuals.

Thwaite Mills was featured in an MSC film produced to encourage new sponsors of Community Enterprise programmes and recently a section of a BBC TV film 'A Future for Yorkshire's Past' described and illustrated the very special character of the Mills.

Throughout the year the Society continued its relationship with the Northern Mill Engine Society. The (inverted triple expansion) 'Shipleigh engine' from Firth Brothers and the 'Denby Dale' engine, a vertical cross compound from Dearnside Mill are now on site. A third engine is expected and NMES are actually searching for a boiler to drive these. Plans are being prepared for the engines to be displayed in a purpose-built engine shed. Recent proposals for the removal of the Raymond Mill would if implemented, free the mill engine house and boiler home of 1930s machinery and gearing. The provision of a suitable replacement engine and boiler is under active consideration.



Corbridge Old Pottery Kilns (Walker's Works).

The last surviving 'Bottle Kilns' in the North East are now open to public view. They form part of the Old Pottery which was formerly Walker's Works on Milkwell Lane, Corbridge, and they are now a Scheduled Ancient Monument in the care of Tyne and Wear Industrial Monuments Trust.

This site is one of the once numerous rural potteries of Northumberland which concentrated in agricultural products, drains, roofing tiles and firebricks made of local clays. Although it went out of use around 1906, it is exceptionally well preserved. As well as the Bottle Kilns, it includes a Circular Downdraught Kiln, some Newcastle Kilns, extensive heated Drying Floors and manufacturing sheds, and the remains of a water-powered Pug Mill.

The name 'Bottle Kiln' derives from the shape of the structure and not its function. Nor is it really a kiln, but the structure which surrounded both the kiln proper and its working area, and provided also a draught for the fire by acting as a tall chimney. The inner kilns themselves have been long since removed from the two on this site, but remains of one have been identified in an archaeological excavation conducted

recently. This type of kiln is more usually associated with the production of finer wares, and there were many on the lower reaches of the rivers Tyne and Wear at one time.

Public access is to the Bottle Kilns alone, as the rest of the structures lie within the private garden of a dwelling house. Visitors are asked not to trespass from the marked path, but from it many of the other features can be clearly seen. The kilns are open to view between 9.00 am and 4.00 pm daily, and occasionally at other times by appointment. There is no formal admission charge, but any donation made to the Trust will be gratefully received.

To find the site which is at OS Grid Ref NY 992 652 proceed from the centre of Corbridge NE along the B6321 (towards the Military Road) about ½ mile. Shortly before the 30 limit end, turn left along Milkwell Lane, past Milkwell Farm, to the Pottery, which is on the right just before the bridge under the bypass road. For further information, please contact the Trust at Sandyford House, Archbold Terrace, Newcastle-upon-Tyne NE2 1ED.

New Scheme at Limehouse. Half of the existing 4½ acres of water-space at London's Limehouse Basin will be retained as amenity area if a redevelopment scheme accepted by the British Waterways Board obtains the necessary planning permission from the London Docklands Development Corporation. Now that commercial shipping traffic has deserted the Basin, once an important transfer point between the River Thames and the Regents Canal, giving access to the whole of the Grand Union canal system, it is intended to provide 600 homes, large areas of shop and office space, a hypermarket and two restaurants, one of which will feature a clock tower to provide a visual focus. The main buildings will be sited around the perimeter of the dock, with some houses on artificial islands founded on a grid of piles; lightweight building materials are being sought so as to minimise the size and cost of the foundations.

Every house and flat will have a view over the basin or the Thames. The developers Hunting Gate Group have promised to include a marina for canal and seagoing boats and a boathouse and workshop for youth boat club. The basin is adjacent to the northern entrance of the Rotherhithe Tunnel and to BR's little-used Stepney Green station, and will be convenient for the new light railway system that is proposed for Docklands. A runner-up in the competition organised by British Waterways for redeveloping the site was a scheme put forward jointly by Nicholas Falk of Industrial Buildings Preservation Trust featuring a transport museum, which for years has provided an unofficial focus for interesting old vessels including an ex Admiralty steam VIC tender and various privately-converted Dutch and Belgian canal barges. This scheme would also have provided a venue for a working steam railway, utilising the existing line that abuts the northern boundary of the site on a viaduct. The winning Hunting Gate plan makes no specific mention of preserving any historic features of the area's transport history, although initial design studies prepared with planning applications in mind suggest a mimicry of early 19th century commercial buildings closely reminiscent of those at St Katherine's Dock a few miles further up-river.

With planners now giving some priority to the notion of 'heritage' in making a new residential and commercial development marketable it seems likely that they would

welcome a historic transport ingredient in this proposed new development. But if owners of historic vehicles and ships are to be induced to provide such an attraction at Limehouse Basin, they will need to be reassured that there will not be a repeat of the sequence of events at St Katherine's, where owners of vessels moored there initially in anticipation of a preferential rental have later seen their annual charges hiked up to a level where the incentive for them to provide a pleasing vista for those living in the adjacent private flats has altogether disappeared. We hope that the promoters of the Limehouse scheme will appreciate the contribution to the local environment that a historic transport collection could make, for there is no shortage of owners who would be willing to provide exhibits if the annual charges and security could be made attractive.

Foxton Inclined Plane. In July 1896, the Grand Junction Canal Company decided to build an Inclined Plane Lift at Foxton, Leicestershire to provide a quick and easy method of transporting boats from the lower level of the canal to the higher. Tenders were received for the job, and it went to Messrs J & H Gwynne and Co of Hammersmith, who tendered £14,130 and in 1898 construction began.

One man was killed in the construction of the Lift; Mr George Robinson, a navy, who was killed by a fall of earth. (From the Parish Records.)

The completed Lift was opened on July 10th, 1900, at a cost of £37,500 including the land.

Each moveable dock was built of steel plates and mounted on eight sets of wheels running on four pairs of rails.

The gradient was 1:4. Each dock measured 80 ft x 15 ft inside, and was capable of accommodating two 35 ton narrow boats or one 70 ton barge. The docks were connected by steel wire ropes of 7" circumference, passing round guide pulleys to the hauling drum. Consequently, when one dock ascended the other descended, thus balancing each other, the engine being there to overcome the friction of the moving parts.

The engine for driving the main hauling drum working the plant was of the double-cylinder high pressure jet condensing type, motion being transmitted to the drum by means of a powerful worm gearing. There were two boilers of the Lancashire type, although one was sufficient power to produce the necessary steam pressure, the second being merely a reserve.

In order to cut down manual labour costs as much as possible, the gates of the docks were raised and lowered by hydraulic power obtained from a horizontal duplex pump.

The pump delivered into an accumulator sufficiently large to hold a reserve of water to work all the necessary cylinders simultaneously.

A Typical Journey Through the Lift. A vessel wishing to ascend would arrive at the bottom and proceed into whichever dock happened to be at the lower level, by the raising of a gate at the end of the dock, the water level in the dock being the same level as that in the canal. The gate was then hydraulically closed and the dock containing the floating vessel hauled up the slope. On arriving at the top the two hydraulic rams would push the dock against the upper canal and form a water-tight seal. The gates at the end of the canal and the dock were simultaneously raised and the vessel

proceeded on its journey.

The time taken to pass either one or four boats was eight minutes (in motion). The complete operating time from start to finish was twelve minutes against the average time of 45 minutes to negotiate the locks.

The potential capacity was 70 tons in either direction ie 8,400 tons per 12 hour day, or approximately 2½ million tons per year.

Three men were permanently employed on the lift, one stoker in the engine house and one to operate each set of gates. The cost of working including the labour was estimated at 1/20 penny per ton.

The Foxton Inclined Plane Trust hopes to restore the lift to working order, and is actively engaged on the reconstruction of the

of 11 aircraft including examples from the former Manchester firm of A V Roe and Co who began manufacture (1910) in part of the Brownsfield Mill off Great Ancoats Street. Avro's former factories at Newton Heath and Chadderton are occupied by the CWS and British Aerospace respectively.

A historic Lancaster bomber many of which were built at Chadderton and assembled at Woodford will go on show at the museum. Other planes will include a Hawker Hunter and Westland helicopter. The aeroplane collection will provide a replica of the 1909 Avro triplane (the original is in the Science Museum aeronautical collection) and an Avro Avian built at Newton Heath in the 1920s. (see 'Preserved Aircraft', P R March)

Exhibits which are of related interest will be on view at Liverpool Road Station such as the Merlin engine from a Spitfire and later jet engines. Inevitably some of the preserved aircraft will not find a space such as the Vulcan Bomber recently returned to Woodford of which all 135 were built at Chadderton and entered service in 1956.

The Manchester Aviation Society may be contacted through Chris Walkden 3 Dennison Road, Cheadle Hulme and **The Aeroplane Collection** through Brian Robinson (author of a **History of Aviation around Manchester**) at 9 Brackley Road, Heaton Chapel. A booklet **N W Motor Museums and Aircraft Builders** (to 1919) by A D George is obtainable from Mrs A Meakin, Department of General Studies, John Dalton Building, Manchester Polytechnic, Chester Street, Manchester M1 5GD.

Another Early Road Tunnel? Liverpool Corporation Quarry in 1774. Notes in previous issues have commented on early road tunnels in England, and sought earlier examples. At present the ill-fated Highgate tunnel of 1809 (it collapsed in 1812 and was widened out into a cutting with overbridge) appears to hold the record as the earliest known road tunnel in the country, with that at Reigate (1823) as the earliest surviving such tunnel. But of course it is a matter of definition. Robert Morris' diaries (**Radical Adventurer: the Diaries of Robert Morris, 1772 - 74** ed by J E Ross, Adams & Dart, 1971, pp 181-82) mention, in the entry for 22 May 1774, what may be a contender for 'earliest road tunnel' status:

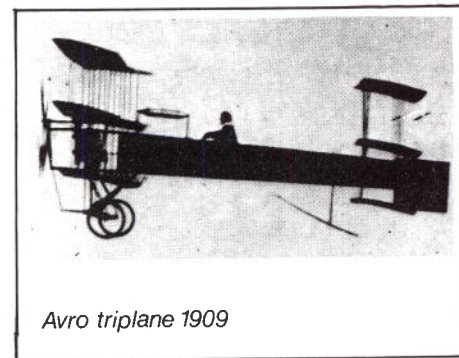
'I took a walk up ye Hill, where the [Liverpool] Corporation Quarry is, which I suppose is as grand as any quarry in Europe: There is a road into it under ground, with large Tunnels for Light: In ye Quarry is a spa spring, though but weak in quality, with persons to serve you to it: There is a grand view of ye River & Town & Country from ye top of ye hill . . .'

Naomi Evetts of the Liverpool Record Office has kindly supplied the following comments and information, which members may be able to supplement:

'The quarry was an open one and the earliest mention of the underground road I can find appears in Enfield's History of Liverpool, 1773, as 'The entrance to the quarry is by a subterraneous passage, supported by archways . . .' A letter published in the magazine *Kaleidoscope*, July 10th, 1821, states that the Corporation were blocking up the subterraneous entrance at Duke Street. In the latter part of the 18th century, the site of the Quarry was laid out as

public walks and gardens and in 1829 St James' Cemetery was opened there. The Anglican Cathedral was built on part of the site and the Cemetery was finally closed in the 1930s and today the gravestones have been removed and the grounds laid out as gardens. A view of the windmill on The Mount which shows part of the Quarry and what appears to be the entrance to the tunnel appears in Pictorial Relics of Ancient Liverpool by W G Herdman, 1843. Two small engravings taken from inside the tunnel looking outwards give some idea of the scale and show the roof and walls to be made from blocks . . .'

'An article entitled St James' Mount, Liverpool, by R T Bailey was published in the Transactions



Avro triplane 1909

of the Historic Society of Lancashire and Cheshire, Vol 97, 1945 pp 101-105. The author states that there had been a quarry on that site since 'time immemorial' and that there were two entrances into the quarry, a cartway at the south end and a 'subterranean tunnel commencing at the junction of Duke Street, Rodney Street and the north end of St James' Road. This tunnel had two eyes to admit light and air, and on each side over the entrance was the figure of a lion, carved in stone. This entrance is now filled in, but the tunnel may be seen from the cemetery'. (Although published in the 1945 volume the article was written in 1916.) The information possibly came from an earlier book Liverpool as it was During the Last Quarter of the 18th century, 1853, which gives similar details.'

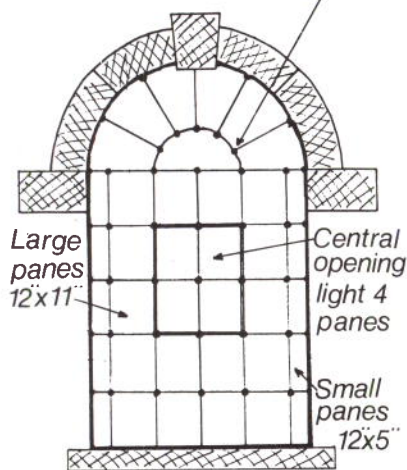
So it appears this tunnel was probably first made as a part of the quarrying operations, and only on their cessation was turned over to public use for access to the 'spa' and ornamental grounds. Whether it accommodated, or was large enough to accommodate, vehicular traffic, and whether it should really count as a road tunnel on a public highway, remain to be determined. Possibly members may be able to provide further information on this interesting structure or others like it?

Paul W Sowan

Dockland Development. Freehold of Liverpool's derelict Albert, Salthouse and Canning docks was handed over to Merseyside Development Corporation on May 24th by Mersey Docks & Harbour Company. Clean up of the warehousing, much of it grade one listed buildings, is underway and contracts to dredge and restore the docks themselves will follow later in the year. The adjacent Merseyside Maritime Museum will use some of the facilities with the future of the remainder of the complex as yet undecided.

Foxton Inclined Plane Boilerhouse windows

2¼" decorative roundels at all glazing bar junctions



Approx overall opening 5-0 x 7-6"

old Boilerhouse as a Trust HQ and Museum. They are attempting to use old items of building 'furniture' wherever possible, including original type windowframes.

Can anyone recognise the manufacturer of this particular frame type? The building was constructed at the turn of the century ie 1898-1900.

Any information would be most welcome, and should be sent to D Goodwin at 36 Harborough Road, Desborough, Northants NN14 2QY.

The Manchester Air and Space Museum. This development is a £2,160,000 project supported by Dr John Tanner, director of the RAF Museum, Hendon, to convert the City Exhibition Hall – the former Lower Campfield Market Hall (1876) which is a listed building. A model of the scheme has been displayed at the Town Hall Information Bureau, in which the City Council is carrying out the restoration and adaptation as a home for exhibits loaned by the RAF Museum and by Manchester's Aeroplane Collection. A trust is being formed to administer the site.

The ground floor will be used for the display

Nene Valley Schemes. The Nene Valley Railway is unusual among preserved lines in that its generous loading gauge enables it to operate oversize Continental locomotives and rolling stock which would be too large for the tunnels and platform overhangs of most British lines.

The Peterborough Railway Society who operate the NVR have made a virtue of this unusual feature, and stock from 8 Western European railway systems can be seen in steam on the NVR's five-mile route regularly throughout the year. A working party is now looking into the possibilities for an International Railway Museum, to be housed in a new building of about 40,000 sq ft, which would make possible the comparison under one roof of examples of railway vehicles from all over the world, with a rail connection to the NVR so that they could be operated from time to time. Comments on this imaginative and ambitious scheme, conceived as complementing the collections at the National Railway Museum and the Science Museum, are invited by the Chairman of the Working Party, Rev Richard Paten, who would also welcome offers of support at 198 Lincoln Road, Peterborough.

Four years ago, the Nene Valley Railway won the trophy awarded annually by the Association of Railway Preservation Societies for the project making the most progress. As we reported in Bulletin 5:4 this was partly in recognition of the line's enterprise in attracting new freight business. On the strength of its operating success, the Peterborough Railway Society is now looking into the possibility of extending its line eastwards to a new station to be built near the centre of Peterborough and adjacent to BR's East Coast Main Line and the Norwich-Birmingham cross-country line.

The route would follow 1½ miles of the old LNWR track bed already owned by the Peterborough Development Corporation which has actively backed the NVR. As well as providing a pick-up point for passengers more convenient than the present rail-head at Orton Mere a 20 minute ride by DMU from Peterborough BR station, the proposed new line could provide a rail connection for a nearby sugar beet factory. To be aligned along the South bank of the River Nene, the new route could provide an important new recreational facility in the Nene Park as it would incorporate a new footpath and cycleway. The NVR study group developing this proposal would be interested to hear comments or criticisms from anyone with an interest in the scheme: write to Jeremy Godbolt, 6 Mendip Road, Oakham, Leics LE15 6NN.

Suspension Wheels and Styal. Quarry Bank Mill, Styal, was the site of one of the first iron suspension wheels designed by Thomas Hewes, the Manchester millwright. The Museum in the making, run by an independent charity, as tenants of the National Trust, has embarked on a major project to restore water power to the site. The 100 horse power prime mover installed as early as 1818 was dismantled at the beginning of this Century and plans are now underway to bring back to the wheel chamber a wheel of similar design and proportions.

The mill has in fact now acquired a wheel built in 1850 by William Fairbairn of Manchester, which is 24 feet in diameter and 22'6" wide. It comes from the old flax mill at Glasshouses near Pateley Bridge, where it had stood since the shaft cracked some twenty years ago.

This is undoubtedly one of the largest surviving suspension wheels in the country and to restore it and install it in the wheel chamber at Styal is the subject of a major programme at Quarry Bank Mill. This includes the restoration of the mill pool, weir, headrace and tailrace. The mill has also been able to acquire the iron penstock, governor and some of the mill work from the Glasshouses mill, all of which will make an appropriate and relevant setting for one of the few surviving objects (and the last surviving wheel) made by the greatest mechanical engineer of the Victorian period.

The mill still needs to raise a further £65,000 to restore the ironwork, cast a new shaft using the existing one as a pattern, and restore the wheel chamber and water power systems. Visitors to the mill this year will see work in progress in the wheel chamber and an introductory audio-visual programme and exhibition. Meanwhile the broken shaft dwarfs their cars parked on the mill car park.

The Mill Trust is researching the Glasshouses site and has noted the existence of numerous other suspension wheels on other sites. David Sekers will be grateful to hear from AIA members who can give information and locations of other suspension wheels (whether surviving or replaced or removed) to help compile a register. Information and (of course) any contributions to the Mill's appeal will be most welcome.

Please write to David Sekers, Quarry Bank Mill, Styal, SK9 4LA.

Industrial Archaeological Records in Wales.

The National Monuments Record for Wales at Edleston House, Aberystwyth, Dyfed, SY23 2HP Tel (0970) 4381 or 4382 has record-cards for over 4,000 Industrial Archaeological sites in the Principality together with many photographs, plans and survey drawings of remains. Such records are exchanged with the British National Archaeological Record of the Ordnance Survey and with the Archaeological Trusts in Wales. The channelling of information via the latter helps to ensure that provision for the preservation of important sites by local councils and other government institutions is made and that selected sites can be archaeologically excavated if threatened. The survey of known sites under threat is carried out by ourselves. It is also hoped to exchange records with the Department of Industry at the National Museum of Wales Cardiff and with other institutions.

We are continually adding to the record and we would be very pleased to hear of or to receive any loans of material in the form of information Photographs, plans or site drawings that we could copy. Copyright can of course remain with the owner. We are always pleased to hear of any IA survey work being carried out in order to ensure that our own investigators and surveyors do not duplicate work. Deposits of material are always welcome.

Early Newcomen Engine-house. What seems to be an almost intact Newcomen Engine-house of the 1770s has been discovered in South Wales. To confirm the purpose of this dateable structure on a known colliery site and to ensure its preservation Stephen Hughes at the above address would like to hear from anyone with plans or records of contemporary engine-houses. The structure in South Wales was re-used as an agricultural building and further site investigation is difficult without 100% confirmation of the structure's purpose. Would this be the earliest

known surviving engine-house structure?

Jolliffe & Banks' Civil Engineering Contracts outside London and South-East England. The civil engineering partnership of William John Jolliffe and Edward Banks operated from 1807 to 1832, based at the stone quarries and limeworks at Merstham, Surrey, although probably relatively little stone or lime from Merstham was used in their major contracts (from 1822 they leased another limeworks at Halling in Kent, and they had extensive dealings in Haytor granite, Aberdeen granite, Portland stone and other constructional materials). An outline of the firm's operations was given by H W Dickinson in 1933 (*Trans Newcomen Soc*, 12, 1-8). An apparently complete **Index of all the works . . .** of the firm has now been located (SoRO C/1961 DD/HY 23), along with a substantially complete series of annual statements for 1813-40 (SoRO C/1961 DD/HY 23, 27 and 36) in the Somerset Record Office at Taunton. The index contains names and costs, but no other details, of the well-known major contracts such as Sheerness Dockyard (£1,463,622); and minor local ones such as the 'Croydon Railway Machine House (£184)' which was probably a weighbridge on the Croydon, Merstham & Godstone Railway, perhaps indeed the Weighbridge Cottage which still stands on Merstham Hill. Entries are not dated, and some locations are obscure. Nor is the extent of each job indicated — the small sums in some cases could hardly have been for the entire construction work. A selection of the entries for work outside London and the south-east is given, in the hope that readers may be able to suggest locations, dates, and references to further published or manuscript information. I have added some tentative locations and dates.

Air & Calder	£169 815	Yorks? 1822-27
Ancholme Navigation	50,188	Lincs? 1828
Cranes for Bermuda	2,466	
Dartmoor Prison	4,386	Devon? 1809-10
Eau Brink Cut	312,610	Norolk? 1819-21
Goole New Inn	4,000	Yorks
Heligoland Light House	7,771	North Sea
Howth Harbour	13,746	Ireland
Haytor Stock	6,930	Devon Haytor Granite Co? 1825-
Lynn Jetties	-	Norfolk
North Hyde Works	931	May in fact be a London site?
Nene Outfall & Cross Keys & Bridge to Nene North Level & Drainage	£207,113	Cambs? 1827-30
Plymouth Cranes	3,600	Devon

Portland Stone for Portsmouth	5,992	Hants
Portsmouth Shoal	-	Hants
Romney Bridge	1,922	? Glam ? Rhymney
Wales Bank	1,808	? Glam ? Cardiff & Leckworth Marshes
York Water Works	6,300))
York Wharf Wall	2,205) May in fact) include a) London site?
York Wharf Buildings	3,019))

Paul W Sowan

Civic Trust for the North West. This active Civic Society has produced a large number of publications of interest to AIA members, some of a propaganda nature whereas others include historical guides. In 1978 they produced a report on the conservation of architecture in the North West entitled **Too Little Too Late** and this survey of the state of conservation at the time is a valuable statement. One of their earliest publications in 1965 was a report on housing rejuvenation and area renewal using a pilot study for Rochdale. One of the most useful guides they have produced is that to Manchester by Philip Atkins; priced at 90p this is a most valuable street-by-street guide to the architecture of this major commercial centre. All these publications and many others can be obtained from the Civic Trust for the North West, Environmental Institute, Greaves School, Bolton Road, Swinton, Manchester M27 2UX.

Oldest Perkins Diesel. A worldwide search has been launched by Perkins to trace the oldest Perkins diesel engine still in operation. The internationally famous company celebrates its Golden Jubilee in 1982 and hopes to find an early Perkins Vixen or Fox diesel engine still in use. When the oldest working unit is found Perkins will offer to replace it with a new engine and the old one will become part of a Perkins Museum exhibit.

Historic Preservation. The Superintendent of Documents, US Government Printing Office, Washington DC 20402 can supply a list of books of interest to industrial archaeologists, many produced by the Heritage, Conservation and Recreation Service. For \$1.75 they will supply you with a historic preservation bibliography detailing all the books available from the service and they also produce a series of preservation briefs sold at 0.75 dollars, the latest being number 6, Dangers of Abrasive Cleaning to Historic Buildings. All excellent value and highly applicable to work in Great Britain.

A complete catalogue of grade I buildings and grade A churches in England together with category A buildings in Scotland and Western Isles and grade I buildings and grade A churches in Wales. Divided into categories of listed buildings by period and type and buildings by counties and churches by diocese. The main interest of the book is the fact that it lists buildings by certain categories and one can

see how poorly the nineteenth and twentieth centuries are represented. In particular one can see that according to the listings there are no industrial buildings listed grade I unless they have been classified as ruins, bridges or commercial buildings. A most useful document indicating that industrial archaeology has a long way to go in persuading central government that industrial buildings are of outstanding importance. The organisation also produces a vast range of other publications and details can be obtained from SAVE Britain's Heritage, 3 Park Square West, London NW1 4LJ, £5 50



The Society for the Protection of Ancient Buildings. Founded in 1877 this Society produces a wide range of information sheets on the repair of ancient buildings. Technical pamphlets published include, Outward leaning walls, Strengthening timber floors, Chimneys in old buildings, Cleaning stone and brick, Fire safety in historic buildings and Treatment of damp in old buildings. They have also published a book entitled 'The repair of ancient buildings' by A R Powys priced at £6.00. Another recent publication is the SPAB Barns book which covers all aspects from landscape value and history, construction and materials, planning and conversion, priced at £2.20 this volume is extremely good value and gives many hints as to the way in which old agricultural buildings can be re-used. All these publications are obtainable from The Society for the Protection of Ancient Buildings at 55 Great Ormond Street, London WC1N 3JA.

Affiliated Societies. Secretaries of the 44 local IA societies now affiliated to the AIA will shortly be receiving a mailing from Marilyn Palmer, Local Societies Liaison Officer, including the minutes of the Working Weekend held at Ironbridge in March 1982, the meeting in London during the AIA Conference and a questionnaire which it is hoped secretaries will complete so that AIA can establish the membership represented and what local societies would like to see the AIA doing for them. The **AIA Lecturers Panel list** has now been published and will also be sent to affiliated societies. Individual AIA members can obtain copies from Stuart Smith at Ironbridge. 60 AIA members are listed, with an indication of topics on which they can speak, type of audience, distance prepared to travel, whether a fee is required etc. The Liaison Officer also holds a list of members of the Crich Tramway Museum Society who are prepared to lecture to IA societies. Both lists will be updated from time to time and amendments should be sent to the Liaison Officer.

The Working Weekend, March 25th-27th 1983 will follow last year's pattern of three business sessions, which will consider (i) society activities — publicity, membership recruitment, regional conferences etc, (ii) field activities — recording, surveying, excavating, storage of records and (iii) preservation activities — re-use of buildings, use of MSC, opening sites to the public etc. Social activities will be included and a slide show of IA overseas is planned as an after-dinner session. Stuart Smith has kindly offered to organise accommodation in Coalport which should have central heating by then, and

also to book Society representatives into the excellent overnight facilities which the Ironbridge area can offer. A booking form and details will be sent to societies at a later date.

Society Activities. Sussex IA Society is organising a short course on practical surveying for archaeology, beginning with a study day at Newhaven on December 4th, 1982. Field work on Sundays in the New Year will include chain and plane table surveying, use of the optical square, levelling and contouring. Information from Mr E W O'Shea, 14 Pelham Terrace, Lewes, East Sussex BN7 2DR. **Gloucester IA Society** were the guests of the Oxford House (RISCA) IA Society for an excursion to the Newport area and the Gwent valleys, while **Nottingham IA Society** were the guests of the Worcester and District IA Society for a visit to Stourport-on-Severn. Addresses of IA societies can be found in the **AIA Directory of Local Societies and Kindred Organisations**, available now from Ironbridge.

The Research Group of **Leicestershire IA Society** has recently completed a book with extensive gazetteers on the IA of Leicestershire, to be published by Leicester Museums early in 1983 as part of their series on the present state of archaeology in the county. The ending of the Batsford IA series means that such work is now very much in the hands of local societies, a point which will be discussed at Ironbridge next March. **Birmingham Railway Museum** have written an interesting account of their experiences with MSC schemes and this will be published in a future Bulletin.

Marilyn Palmer
Local Societies Liaison Officer

Bulletin Inserts. In an effort to keep down the AIA subscription the Council tries to generate income by sending out advertisements with the Bulletin. The cost of inserting leaflets with the Bulletin varies from 3p to 10p depending on the size of the insert and the membership secretary is keen to know of societies or suppliers who may wish to avail themselves of this opportunity. At present the membership of the Association is approximately 800 and this is very cheap form of distributing information to a specialised group of approximately 800 people. Further details from the Membership Secretary.

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