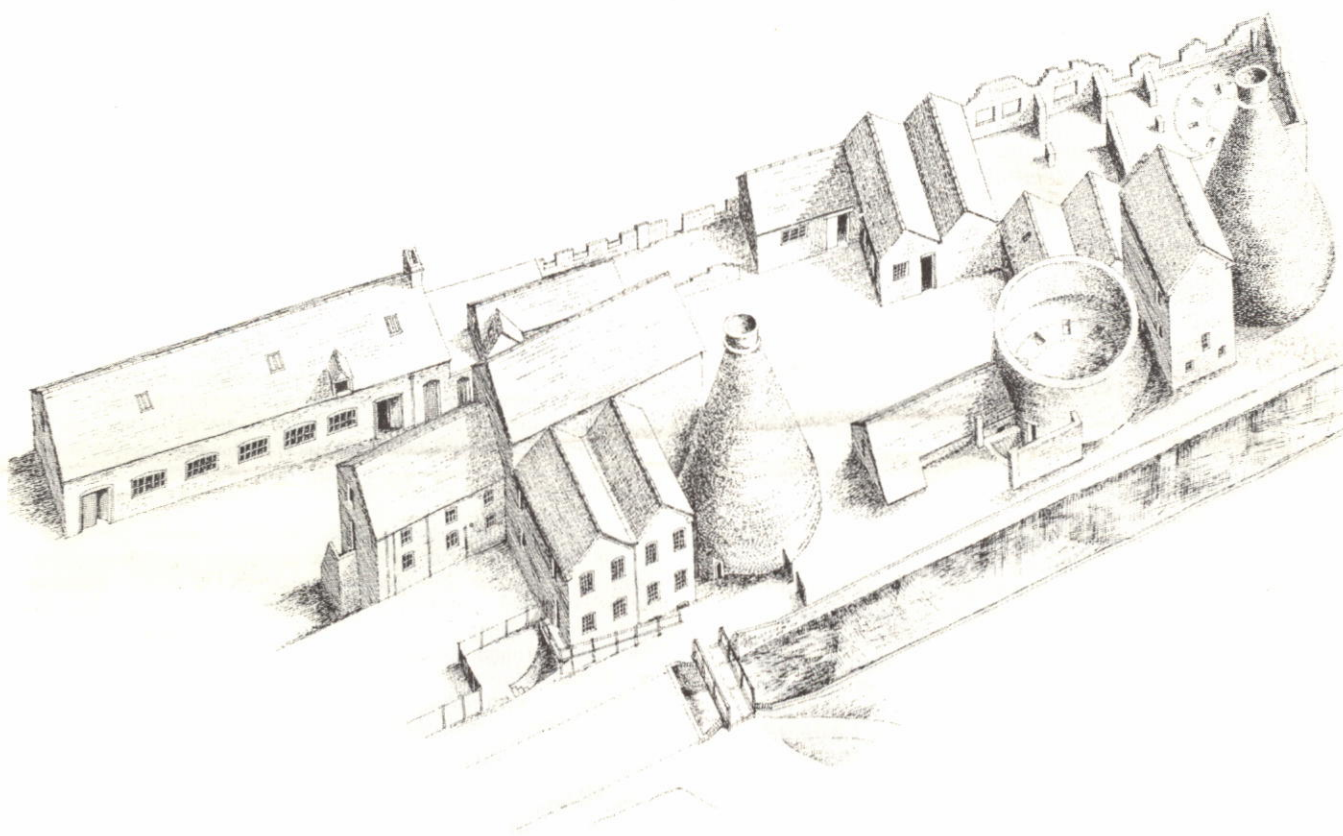


BULLETIN 3.3

OCTOBER, 1976



### COALPORT CHINA WORKS MUSEUM

Fifty years ago, in 1926, the Coalport China Company closed their works on the banks of the River Severn in Shropshire and moved to Stoke-on-Trent where they have traded under their original name ever since. But the surviving buildings, despite having been occupied by another manufacturer, are still substantially intact and provide the basis for a new Museum of Coalport China covering the history and technology of the industry and the people involved in it, and presenting a spectacular collection of the products of the Company. The village of Coalport is now part of the New Town of Telford and the China Works Museum is a new important component of the Ironbridge Gorge Museum complex.

Creation of the new Museum has been assisted by numerous people and organisations including Telford Development Corporation who financed restoration of the buildings and are leasing them to the Museum Trust, and the Coalport Company itself. In addition many local people have been involved, including retired employees of the Company and they have provided by gift or loan much of the fine china which is on display. The Friends of the Museum and innumerable volunteer groups have also given invaluable assistance.

Restoration of the buildings and associated canal has been carried out to the Museum Trusts specification by Contractors and Museum craftsmen as have the displays themselves, designed by Robin Wade

Design Associates.

The Museum itself consists of a foyer containing a shop in which a wide range of Coalport china and books on pottery may be purchased, followed by an introductory gallery covering the resources necessary to create a piece of china. Next in sequence is a 'dictionary of terms' designed to acquaint the visitor with the mystical language of the pottery industry with words such as 'blunger', 'frit', 'grog', 'jigger' and 'jolley'. Subsequent sections of the museum include a chronology of ceramics manufacture in the Ironbridge Gorge, an audio-visual devoted to the people who lived and worked in Coalport and in one of the two remaining bottle kilns a display of early products of the Company - a spectacular and glowing presentation of fine bone china; the finest display of Coalport on public display anywhere.

The archaeology section of the Friends of the Museum have been excavating at Coalport for two seasons, and together with historical research being done on the buildings themselves, it is shortly hoped to publish a book on the complicated development of this site and its products.

The museum is open 10.00 a.m. - 6.00 p.m. every day of the year, enquiries to the Ironbridge Gorge Museum Trust, Ironbridge 3522.



## SEE HOW IT RUNS

One of the few remaining industries whose equipment seems to have come straight from the pages of Diderot is the Cheshire salt-panning industry, localised around the village of Marston near Northwich. Here brine from the ground is still evaporated in large pans and much of the final product is shipped to West Africa for use in preserving fish.

Congestion in the Port of Lagos has done nothing to assist this trade, since of course the commodity is not paid for by the importer until it is landed. While a demand for pan salt continues, the industry is its own best museum. But some effort has been devoted in the Northwich area to recording those aspects of the industry which have already disappeared or seem likely to do so shortly. At the Sunbeam salt works at Wincham, about a mile from Marston, a 19th century horizontal steam engine survived until recently, which pumped brine from a 130ft deep well to evaporating pans nearby. The county authorities hoped to preserve this engine and its associated equipment but while discussions were in progress the complex was dismantled and removed, probably by scrap metal thieves, and nothing now remains but the foundations and a few worthless fragments of the mechanism.

Arthur Bebbington, a member of the Association, knows the area well and surveyed the Sunbeam pump shortly before it disappeared. His account which follows appeared in the fifth 'Newsletter' of the North Western Society for Industrial Archaeology and History and we reproduce it here with acknowledgements to Mr. Bebbington and to the Society. The fact that we must now substitute the past tense throughout is a reminder that delay in compiling a record, even where the site may not seem to be threatened with destruction or alteration, all too often results in the site being flattened overnight. And how many of those hundreds of colour slides which, you promised yourself, will one day illustrate a lecture ever see the light of day again after they have slithered across your breakfast table on return from processing and then disappear into a top drawer to keep company with dozens of other identical plastic boxes? Let us not forget altogether the humble black and white negative film, which even in the 35mm. format can yield excellent results for record purposes, and in a medium very much more manageable and versatile than colour transparencies.

"At the turn of the century there were a large number of small salt works in the Northwich, Marston, Wincham area producing pan salt from brine pumped in the immediate vicinity and each of course with at least one and probably more steam driven pumps.

With one exception all these have now completely disappeared, their place being taken by the large works producing vacuum salt, the one exception being the very old established firm of Messrs. Thompson-Ingram & Co., of the Lion Salt Works, Marston, Northwich, under the direction of Mr. Henry Thompson.

Until some 5 years ago this concern also worked the Sunbeam salt works, a works of some 6 full size pans and situated at Wincham about a mile from the Lion works and until the closure the brine was supplied to the works by a deep well pump driven by a horizontal steam engine supplied with steam by a 20ft. by 6ft. 6ins. Cornish boiler with a working pressure of 30 p.s.i., which with an evaporation of around 1800 lbs. per hour, was ample to ensure easy and economical firing on the rather inferior slack used by most salt works for pans and boilers.

The engine, made by Messrs. Abraham Lord, Rochdale, of whom little appears to be known, is a horizontal single cylinder slide valve type of around 9 i.h.p. with a cylinder of 10" diameter, the piston rod driving through a crosshead working in 4 bar slides via the connecting rod to a disc crank giving a stroke of 23", the crank shaft in addition to the eccentric working the slide valve and a fly wheel 68" x 9" also carried a herring bone pinion gear of 25 teeth which in turn drives a layshaft on the engine bed immediately in front of the crank shaft through a herring bone gear of 126 teeth giving a ratio of 5 revolutions of the engine to 1 stroke of the pump.

A disc crank on the end of the layshaft giving a stroke of 46" is communicated to the pump by a large wooden rod strapped with iron and working to a massive bell crank situated outside the engine house and to which is fitted a balance bob in the form of a large rectangular piece of cast iron held by two pieces of rail bolted to the bell crank, this arrangement assisting the engine on the rising or delivery stroke of the pump.

From the nose of the bell crank an iron pump rod works through a gland fitted to the top of a 6" standpipe up which the brine is lifted and in which the rod works terminating in

a plunger fitted with a clack valve and working in a gunmetal pump barrel of 4" dia. the footvalve of the pump is approximately 125 ft. below ground level and the plunger is made tight by hydraulic cup leathers.

The total depth of the well shaft is approx. 130 ft. and it was found that the plant worked most economically and most easily without shock or shudder at 35 strokes per minute on the engine to 7 strokes on the pump and at 7 gallons per stroke gave an output of 50 gallons per minute and 3,000 gallons per hour.

A 6" offset near the top of the rising main fitted with non-return valve delivers the brine into a receiver made from an old Lancashire boiler with flues removed and set on brick pillars about 10ft. high and from this it flows into the reservoir below which is about 150 ft. square and 20 ft. deep the sides being of finely set blue engineering brick and with a steep inward batter, from the reservoir the brine flowed by gravity to the salt works and was fed into the pans for evaporation as required, the distance being about half a mile.

The steam from the Cornish boiler is supplied to the engine stop valve by a 3" cast iron steam main in which is also fitted the governor throttle valve operated by an attractive rod pattern governor which is driven through bevel gearing from a toggle on the crankpin. The exhaust steam passes through a feedwater heater fixed in the roof space above the boiler and from there is passed through a coil fixed in the Lancashire boiler receiver where it is condensed and also slightly warms the brine.

The condensate then falls into a tank fixed at ground level and, after the oil had been skimmed from the surface by the engineman for reuse in the engine lubricators, was returned to the boiler as feedwater by a steam driven Cameron feed-water pump. Although the engine cannot be regarded as a condensing engine it may be that some of the backpressure was removed by the condensing coil; from all points of view it would appear that the plant was fairly economical and embodied the best practices of its period and was easily worked in its entirety by one man.

The entire plant was installed in its present position around 1885 and thus gave over 80 years relatively trouble free service which is a great tribute both to the makers and the operators and it is unique in being the last remaining unit complete in all details and typical of the great number used in the Cheshire salt fields over 100 years ago".

It is gratifying to know that a similar horizontal engine, also made by Abraham Lord of Rochdale which pumped brine at the existing Lion Salt Works has been saved from a similar fate. Arthur Bebbington and his fellow-members of the South Cheshire I.A. Society persuaded the Cheshire County Libraries and Museums Service to purchase the engine last year, and it has since been dismantled and removed to a museum store, for eventual re-erection as part of a proposed museum which, it is hoped, will portray this unique industry with the detail it deserves.

## CAMBRIDGE MUSEUM OF TECHNOLOGY

Cambridge is creating a Museum of technology built around the pair of pumping engines at the old pumping station in Cheddar's Lane. Centrepiece of the project are the two massive Hathorn Davey 80hp steam engines installed in 1894. It is hoped to restore these engines, to full working order.

Only fifteen years later, engineering progress had been such that gas was used to power two additional engines. These also survive and are run on Open Days.

By 1937, further power for the expanding city of Cambridge was required, and electricity supplied the answer. The 114 hp electric pump on the site is of essentially the same type as those used in modern plants.

The Museum is intended to display items illustrating industrial activity in Cambridgeshire from 1800 to the present day. Exhibits already range from a fine 1860 Headly horizontal steam engine to the University's Titan computer of 1963. Current restoration projects include a Fenland barge raised from a flooded clay pit near Ely, and a bogie coach of 1884 from the Wisbech and Upwell Tramway. The Museum is open to the public regularly, and attracts visitors from all over East Anglia.

If you wish to support this project please send your contributions to: The Treasurer, Cambridge Museum of Technology, Engineering Department, Trimpington Street, Cambridge CB2 1PZ.



## A HISTORY OF THE NORTH WALES SLATE INDUSTRY,

By Jean Lindsay, DAVID & CHARLES, Newton Abbot, 1974, pp 366, 31 ill, 1 map, £6.50

The material manifestations of the slate industry have left more indelible scars on the landscape of North Wales than the collieries have in the south of the Principality; yet this is the first book to be devoted entirely to the history of this industry. It had been considered by the indefatigable Professor A. H. Dodd in his *Industrial Revolution of North Wales*, which was published in 1951, and various aspects of the industry have been the subjects for a number of unpublished theses. With an industry which in its heyday employed well over 14,000 men, reduced today to a few hundred and now presented to the public in the form of the Slate Quarry Museum at Dinorwic and by the Llechwedd 'Quarry Tours'; Dr. Lindsay's book has appeared at an opportune moment. Jean Lindsay is an economic historian and as might be expected this excellent book deals with the subject historically rather than archaeologically. In her introductory chapter which covers the use of slate up to 1731, she has not let even the smallest fragment of recorded medieval slate pass through her fingers. The next chapter deals with the development of the great Penrhyn Quarry at Bethesda up to 1782. Prior to the mid-eighteenth century all slate quarries had been very modest excavations — with very few exceptions — exploited by native Welsh landowners, and the language at the quarry face has been almost entirely Welsh. Full use has been made of local records, especially the valuable collection of Penrhyn Papers in the University at Bangor. The story is continued and an unemotional account is given of the popular scandal concerning the Penrhyn Quarry owner's encroachment onto common land in 1823; a time when the profits rose from £9,802 in 1816 to £14,945 in 1829. The other perhaps better known great quarry at Dinorwic Llanberis, where its tiers of galleries tower above Llyn Peris was second in the field.

A full discussion is given of one of the major problems which faced the quarry owners, that of transport to the sea. The area had no canals and few roads and only inadequate quays at Conway and Caernarvon. Tramways were built early in the nineteenth century, which later after conversion to steam, were to become the famous narrow gauge railways of North Wales. Port Penrhyn built at Abercegin creek near Bangor served the Penrhyn Quarry, and Port Dinorwic the Dinorwic Quarry. Portmadoc exported slates from several quarries at Ffestiniog, and the now famous Talyllyn Railway carried slate from Abergynolwyn to Towyn and the Cambrian Railway whilst the Corris Railway operating in the same area terminated at a quay on the Dovey west of Machynlleth. Portmadoc was the major port for exporting slate overseas, the tonnage rising from 55,000 in 1856 to 155,000 in 1880.

The many vicissitudes affecting the industry are dealt with in detail; these included the tax imposed in 1794 and repealed in 1831, war and later labour troubles which eventually led to the establishment of a trade union in 1874 following the first major strike at Penrhyn — perhaps a significant anniversary for the appearance of this book. Of great interest are the economic and social consequences of the growth of the industry: in the use of barracks made necessary by the remote situation of many of the quarries and the methods of making bargains between the owners and small partnerships of men. After the peaks of production in the 1890s the industry declined. gradually for a variety of reasons, some very obvious such as the greater depth of excavation needed, together with the introduction of cheaper imported slate and in particular the advent of cheap manufactured roofing tiles. The effect of the world war was lasting: the small ships had gone and rail transport was costly. Attempts were made to infuse life into the industry by amalgamations and unsatisfactory experiments to re-use slate dust and waste. The production of tiles in 1935 was 1.2m tons in comparison with 271,000 tons of slate.

The only major quarry now in production is Penrhyn which since 1964 has been worked by modern methods by Sir Alfred McAlpine and Son. Dinorwic closed in 1969 to become the Slate Museum in 1972, the same year that the Dorothea Quarry at Nantlle was acquired by a Welsh speculator as a tourist venture. The book ends with a useful gazetteer consisting of 110 short descriptions of the most important slate quarries together with a bibliography. The book has full references numbered separately in chapters at the end, but the reader is helped by being given the pagination of the chapters. Although most of the photographs are old ones and valuable as records, it would have been enhanced by the inclusion of a few dramatic modern views of quarries or one of the Gorseddau slate mill which is the most striking example of industrial architecture in Caernarvonshire; the dust cover too is a little dreary. The short chapter on mechanisation cannot go into great detail, but I find it difficult to believe that the introduction of a Kellow drill

reduced the time required to bore a 7½ ft. hole from 10 hours to 1½ minutes. This is an excellent book which is unlikely to be bettered and it should inspire industrial archaeologists to record some of the machinery and buildings before it is too late. It is one of the best and most authoritative books David & Charles have published.

Royal Commission on Ancient Monuments (Wales)

Douglas B. Hague

## ESSEX AND THE INDUSTRIAL REVOLUTION

By John Booker, ESSEX RECORD OFFICE, Chelmsford, 1974, pp 244, ill, £3.50.

Mr. Booker, Senior Assistant Archivist at the Essex Record Office, uses the wealth of papers deposited there as the basis of a thorough study of the county's industrial history over the past two hundred years. By relating written and printed evidence wherever possible to physical survivals he has produced a valuable guide and reference book for industrial archaeologists. Non-specialists will enjoy the easy narrative as it moves from a simple technical description to penetrate every corner of the county for examples. Readers with deeper commitment and experience will be impressed by Mr. Booker's ability to fit local developments into the national context. The evolution of an iron-founding industry and its contribution to the county's consciously progressive agriculture is a major theme of the work; stress is also laid on the increasing importance of engineering throughout the nineteenth century — there were steam-engine builders of more than passing interest — not only to farming but also to related activities such as milling. The impact of the steam-driven roller mill is seen through correspondence and other records from millers and farmers writing just when the tragicomedy of the Darby steam-powered Digger opened, in the last quarter of the century. Fresh and effective argument is put forward to show how in some localities iron, and in other silk, took the place of the dying cloth industry. Even more impressive is the way in which Mr. Booker applies primary material in the field of communications. That the Trusts and the Justices were not the only people to cause direction — and distance — markers to be erected is well known. What Mr. Booker does, by a combination of direct evidence and close reasoning, is to identify a variety of other individuals and groups who also contributed either to the construction or to the marking of a substantial mileage of non-Trust roads. Schemes for railways and waterways, many of them abortive, are given similarly detailed treatment, while the chapter on the public services is unusually generous on this subject. The book ends with an assessment of the effect of industrial change on the lives of the people — the growth of London-over-the-Border; the houses, in rows or in 'garden cities'; the communal buildings that followed them.

Occasionally there is a glimpse of humour, sometimes a passing aesthetic evaluation, but in general the author's view is that he should give the facts, leaving the reader to judge on whether or not the artifact described should be allowed to perish or to survive. And one can hardly ask fairer than that.

Maldon.

D. W. Hutchings.

## APPEAL

The Sussex I.A. Society are attempting to restore Coulter's mill near Petworth.

The machinery installed prior to 1789 consists of a timber framed beam engine driven by an 11' dia. breast wheel 55" wide. The water-wheel shaft is direct coupled to a 3-throw cast-iron crankshaft which actuates three beams (pivoted at one end) by means of 3 wrought-iron connecting rods.

Vertical piston rods connected at their tops to the outer ends of the beams operate plunger-type pistons working in a triple-barrel cast-iron pump body. The outlet from the pump is provided with stop valve, non-return valve and air-chamber.

Some 20,000 gallons per day could be delivered to Petworth through a 3" dia. cast-iron pipe nearly 1½ miles long which rises 150' to a brick cistern holding 23,000 gallons on Lawn Hill in Petworth Park, also a cistern and filter in Grove Street, Petworth. From these cisterns water was fed by gravity to Petworth House and gardens and to points in the Town.

The Sussex Industrial Archaeology Society have permission from Lord Egremont to restore the installation to working order, and a preliminary examination shows this to be feasible. It is hoped that eventually, it will be possible to open the site to the public.

Restoration will be by voluntary labour recruited from members of the Sussex Industrial Archaeology Society, but it will be necessary to purchase materials to a value of about £500.00 of which £300.00 will go in replacing the old timbers of the mill wheel and sluices. For further details or arrangement for a conducted visit to the site please telephone: A. G. Allnutt, Chichester 86044. Please send donations to the Treasurer: Mr. T. J. Goode, 30 St. Peter's Road Seaford.



## PUBLICATIONS

### FIRESTONE AND HEARTHSTONE MINES IN THE UPPER GREENSAND OF EAST SURREY

Paul W. Sowan (AIA), Proceedings of the Geologists' Association Vol. 86, Part 4, 1975, pages 571 - 591.

Well researched and written, this article is to be commended for re-discovering an otherwise neglected aspect of mining history.

### EUROPEAN ARCHITECTURAL HERITAGE YEAR - CITY OF PLYMOUTH

Published by the City Planning Officer, Plymouth.

This large format booklet contains interesting line drawings of buildings in and around Plymouth, many of I.A. interest. Very useful for the casual visitor.

### CAST IRON AND THE CRESCENT CITY

By Ann M. Masson and Lydia J. Owen, 1976, obtainable from the Friends of Cast Iron Architecture, 44 West 9th Street, New York, N.Y. 10011.

This catalogue of an exhibition held in New Orleans during the Spring of this year, contains excellent photographs of surviving cast iron buildings in the City and also many re-productions of contemporary trade catalogues. Very useful for comparison with British examples.

### LOUND HALL MUSEUM

The following publications are available from the Lound Hall Mining Museum, Near Bevercoates Colliery, Houghton, Retford, Notts.

By A. R. Griffin

Thomas North: Mining Entrepreneur Extraordinary, 1972. 30p  
Reprinted from the Transactions of the Thoroton Society of Nottinghamshire.

Babbington Colliery: Birthplace of Modern Mining in Nottinghamshire. 10p  
Reprinted from the Colliery Guardian, November, 1975.

Methodism and Trade Unionism in the Nottinghamshire-Derbyshire Coalfield 1844-90 10p  
Reprinted from the Proceedings of the Wesley Historical Society, 1969.

A Century of Coal Mining at Newstead 10p  
Reprinted from the Colliery Guardian, October, 1974

By A. R. & C. P. Griffin

The Role of Coal Owner's Associations in the East Midlands in the Nineteenth Century. 20p  
Reprinted from Renaissance and Modern Studies, Vol. XVII, 1973.

### BUILDING EARLY AMERICA

Charles E. Paterson, F.A.I.A. Ed., 1976, paperback \$9.95. The Chiltern Book Company, Radnor, PA 19089, U.S.A.

Produced as a result of the symposium held at Philadelphia to celebrate the 250th birthday of the Carpenters Company of the City and County of Philadelphia, the book contains an enormous amount of valuable work on British as well as American practice. Essential reading for those interested in the historical aspects of building and architecture.

### CAST IRON ARCHITECTURE IN PHILADELPHIA

Ralph Chiomenti, 1976. 25c plus postage, from the Friends of Cast Iron Architecture, 44 West Ninth Street, room 20, New York, N.Y. 10011.

It is a great disappointment to British Industrial Archaeologists that although the iron framed building was developed in this country and many important examples still exist, the initiative was taken by the U.S.A. and that is where the bulk of iron buildings are now to be found. The Friends of Cast Iron Architecture are extremely active in the U.S.A. (and they have many British supporters), and this is another of their invaluable guides to material which will make the reader envious.

## WELSH COAL MINES

By Dr. W. Gerwyn Thomas (A.I.A.) pub. 1976, by the National Museum of Wales, Cathays Park, Cardiff, CF1 3NP. 64pp, 97 mono-chrome illustrations, 3 maps price 45 pence, postage 17 pence.

A wide range of coal mines are featured: they differ in period, historical significance, type and locality. Technological and human factors are also illustrated. The book includes examples of a gin-pit and an adit level of the 18th century, water-balance pits of the early 19th century, Cornish engine-houses and other types of steam engine houses and colliery buildings built later in that century. Modern colliery buildings and structures are also represented. Accompanying the general views, in some cases, are photographs showing the interiors of engine houses and other colliery buildings. Coal-mining operations underground, including hand-working and mechanised workings, are also illustrated.

## WOAD IN THE FENS

By Norma T. Wills, published by the Society for Lincolnshire History and Archaeology in 1975 and obtainable from Neil R. Wright, 74 Alexandra Terrace, Lincoln LN1 1JE, price 50p.

Describes the origins, history, use and processing of woad; a valuable dyestuff and mordant. Fascinating reading for all those who thought that woad was only used by Ancient Britons!

## CONSERVATION CANADA

Published by Parks Canada, Department of Indian and Northern Affairs, Ottawa, K1A 0H4.

This quarterly magazine frequently contains articles of I.A. interest. Vol. 2, No. 1 has an article on the recovery and re-erection of a Reidler pumping engine built in 1903 by the Alis Chalmers Co. of Chicago for the Klondike Goldfield. Although the engine was never a financial success, it will form the central exhibit for an interpretive center on the gold rush in the Yukon.

## A SHORT HISTORY OF DEVONPORT ROYAL DOCKYARD

By George Dicker, pub. 1971, price 5p, obtainable from the Devonport Dockyard, Plymouth.

The yard contains many buildings of I.A. interest and it is a pity that this booklet, although extremely cheap, does not describe them in greater detail.

## FARNHAM POTTERIES

by P.D.C. Brears, published 1971 by Phillimore & Co., Shopwyke Hall, Chichester, Sussex. price 40p.

A neatly presented history of a local industry that has declined over the last 150 years. The Farnham area produced coarse earthenware using local clay and primitive firing techniques, very different from the traditional ceramic centres.

## THE INDUSTRIAL ARCHAEOLOGY OF SCOTLAND, 1. THE LOWLANDS AND BORDERS.

By John R. Hume (AIA), published 1976 by Batsford. price £5.95.

First in a series of the I.A. of the British Isles under the general editorship of Keith Falconer (AIA). A review will appear in the Bulletin after publication.

## CAST IRON ARCHITECTURE IN NEW YORK.

By Margot Goyle and Edmund V. Gillon. Published by Dover Publications, 180 Varick Street, New York, N.Y. 10014, price \$6.

Lavishly illustrated and beautifully produced, this guide to the cast iron buildings of New York will go a long way towards popularising the preservation of such a wealth of important buildings. If only they had been built in Britain . . . !



## **BURDETT'S MAP OF DERBYSHIRE, 1791.**

Intro by J. B. Harvey, D. V. Fowkes, J. C. Harvey, pub. by Derbyshire Archaeological Society 1975. Obtainable from the Arkwright Society, Tawney House, Matlock, Derbyshire DE4 3BT.

A fascinating map, surveyed between 1762 and 1767 which was revised by Snowden and Cary in 1791. The extremely informative introduction is complemented by the fine quality of the map. For those who do not know the country, the lack of a key map may be a problem.

## **THE SWEDISH BLAST FURNACE IN THE 19th CENTURY**

Ivor Bohm, pub. by the Historical Metallurgy Group 1974.

The lack of a similar book on British practice makes this book all the more readable. Well illustrated and clearly explained, the book will appeal to specialist and novice alike.

## **THE OLD METAL MINES OF MID WALES, PART 3 — CARDIGANSHIRE**

— North of Coganin  
David E. Bick (AIA) 1976, pub. The Pound House, Newent  
Glos. GL18 1PS. £1.20

A further splendid addition to this series on the metal mines of Wales. In these days of rising book prices it is good to see that good books can be produced at a reasonable price.

## **NORTH EAST SAIL**

Robert Simper, David and Charles, £4.50.

A survey of all the sailing vessels found on the North East Coast of Britain from 1850 to the end of the First World War. Very readable and extremely well illustrated.

Bury Museum has published the first of what is planned as a series of local history trials. Written by the Museum Assistant, Ken Howarth, it covers a 5 mile stretch of the Manchester Bolton and Bury Canal and identifies the many industrial relics to be seen along that particular stretch of the canal.

Copies are available from the Museum, Moss Street, Bury at 15p. including postage.

Luton Museum has published another in its series of large-format (28 cm x 43 cm) books reproducing early 19th century illustrations. The first two in the series "The Turnpike Age" and "Waterways Heritage" were devoted to roads and canals, and have enjoyed a deservedly wide sale, both having been reprinted several times. The latest volume features selections from W. H. Pyne's 'Microcosm', first published in 1808, which has long been a standard source for chronicling the impact of technology on the people of Britain at that time. In this reprint, entitled "Early Trades and Industries", Pyne's aquatints, originally conceived more as a guide to aspiring artists than as a record of contemporary trades, have been reproduced in sepia tones, with Gray's original commentaries. Copies are available from Luton Museum and Art Gallery, Wandown Park, Luton LU2 7HA at £1.70 including postage.

The Corinium Museum at Park Street, Cirencester has published an account of the Thames and Severn Canal illustrated with 57 photographs and 6 line drawings which is equally useful to anyone interested in the canal's history or in following its course to-day. The author is the Museum's curator. David Viner and copies are available from the Museum at £1.20 plus 15p for postage.

Clay tobacco pipes often provide vital evidence on archaeological sites. Adrian Oswald's standard work on the subject is now joined by a study specifically devoted to Broseley pipes, covering the complete typology from the seventeenth century, when Broseley rose to prominence in the Midlands market, to 1950 when the industry finally died out. The author, D. R. Atkinson, F.S.A., had the book published privately last year and copies are available from him at £2.00 plus 10p for postage from 6 Wetherby Place, London SW7 4NE.

As an example of what can be achieved within a modest format, readers might like to consider a copy of the joint newsletter of the Scottish Society for Industrial Archaeology and the Scottish Society for the Preservation of Historic Machinery. The Spring 1976 issue combines newsletter 7 part 3 and 8 part 1. Further amalgamations are planned for the next issue to be published in July 1976 when it will combine with the well established newsletter of the Business Archives Council of Scotland. The present editor is John Hume of the Department of History University of Strathclyde and in the present issue he has included a number of items of 'Site News' together with a detailed itinerary by Sylvia Clark of the Shaws Waterfalls, a 19th century scheme to bring water-power plentifully to Greenock, many monuments of which remain unobtrusively in and around the town.

Stevenage Museum offers "Windmills in Surrey and Greater London, a contemporary survey", by Arthur C. Smith. Remittances (50p plus 15p postage) should be addressed to Stevenage Museum, Lytton Way, Stevenage SG1 1XR.

BWB's new publication "Canal Architecture in Britain" brings to the paperback format the very high standard of architectural and engineering photography apparent in several of the recent lavishly illustrated colour volumes offering general coverage of I.A. In his forward the Board's chairman, Sir Frank Price points out that E.A.H.Y. "has taught people to look at familiar buildings with a new interest and a greater appreciation". This publication will open many people's eyes to the merits of even the most prosaic panel side building. Available from British Waterways Board, Melbury House, Melbury Terrace, London NW1 6JX at £1.50 plus 30p for postage.

## **HAMPSHIRE INDUSTRIAL ARCHAEOLOGY — A GUIDE**

Edited by Monica Ellis, published 1975 by the Southampton University I.A. Group, Department of Archaeology, The University Southampton.

A comprehensive survey of industrial remains in a fairly non-industrial county. Includes brick making, breweries, food processing, paper, salt etc. Transport relics have not been neglected, neither have the extractive industries. Well produced with map references and clear, concise descriptions.

## **"THEN AND NOW" SERIES OF BOOKLETS ON THE ARCHITECTURAL HERITAGE OF SOUTH DEVON.**

Totnes and District; Dartmouth, Kingswear and District, Kingsbridge and District. Published by the Dartington Amenity Research Trust.

Profusely illustrated with punchy text. Contains a surprising amount of I.A. material.

## **BARNSTAPLE'S I.A., AND TIVERTON'S I.A.**

Both priced at 30p are produced by the Exeter I.A. Group and these publications and the "Then and Now" series are available from the Group at the Department of Economic History, University of Exeter, Exeter.

## **INDUSTRIAL ARCHAEOLOGY IN WILTSHIRE**

edited by K. G. Panting, published by the Wiltshire Archaeological Society 1973, and obtainable from Donald Cross (AIA), "Wyndhams", Shrewton, Wiltshire. price 30p.

The striking cover of this county guide encloses gazetteers of transport, textile, houses and workshops, wind and water power, quarries, agriculture and miscellaneous sites. Well illustrated with good maps.

## **DERBYSHIRE ARCHAEOLOGICAL SOCIETY NEWSLETTER, No.2, JUNE 1976.**

EDITOR : KEITH REEDMAN (A.I.A.)

Produced as an interim measure, prior to the publication of the Societies' Journal, the newsletter contains information on Derbyshire brickworks, accessions of I.A. interest at Derby Record Office and details of I.A. Conferences.

## **THE CLEVELAND INDUSTRIAL ARCHAEOLOGIST VOL. 5**

This is now available at £1.15 (including p & p) per copy from Mr. A. Shayler, 44 Zetland Road, Redcar, Cleveland. Contains articles on:-

Whinstone Mining and quarrying in N. E. Yorkshire, Philip Webb and the Bell Family. Philip Webb's Industrial Buildings for Bell Brothers in their Local Context. The Kilton Ironstone Mine. St John's Mine, Tynehead, Garrigill.

Number one to three are now out of print but, number four is still available at 86 pence including postage and packing and has articles on The Chemical Industry's of the North-East.



## SUSSEX INDUSTRIAL HISTORY, SPRING 1976

Journal of the Sussex Industrial Archaeology Society, obtainable from A. J. Haselfoot (AIA), Albion House, Cobourg Place, Hastings. Price £1.40.

Articles include the restoration of Bateman's Mill, Goldstone pump-station, East Sussex milestones, railway development in the Midhurst area. Clear photographs and well drawn diagrams.

## ATTENTION LOCAL GROUPS

The AIA is anxious to keep a central record of all local groups and societies active in the field of I.A. Please send details of all officers, publications etc., to the A.I.A. Secretary, as soon as possible. If you wish your publications to be mentioned in the Bulletin, then please ensure they are posted regularly to the Secretary.

## CHEMICAL SPRAY SPEEDS RAILWAY RESTORATION

A donation of chemicals by CIBA-GEIGY to rid the Bowes Railway of unsightly weed growth has given fresh impetus to work on the restoration of the 150 year-old colliery line, preserved by the Tyne and Wear Industrial Monuments Trust.

## A.I.A. in I.O.W.

An I.A. group has been formed on the Isle of Wight to fulfil a need that has been felt for a long time. The organiser is Clive B. Burland, 103 Mill Hill Road, Cowes, Isle of Wight, and meetings have already been arranged throughout the winter.

## THE WANLOCKHEAD MUSEUM TRUST

WANLOCKHEAD (NS 875 130).

This village, the highest in Scotland, lies in the Lowther Hills, Dumfriesshire (pop 170). With nearby Leadhills it has been associated for many centuries with the mining of gold, silver and lead and zinc ores.

Many interesting remains of the lead workings of the 18th and 19th centuries can be seen. They include sites of early Watt engines, the first steam pumping engine built by Symington of steamboat fame, shafts and levels, water courses planned by Smeaton, horse tramways, and smelting and ore preparation sites. A magnificent water-powered wooden beam engine stands at the foot of the village.

The Trust was formed in July 1974 to establish the Museum of the Scottish Lead Mining Industry. Since then it has converted a derelict lead miner's cottage for use as a temporary mining and social museum in which the Trust's collection of mining relics and archives are housed pending the move to larger premises. The Miners' Library, founded 1756, has been gifted to the Trust and is being restored.

By arrangement with the landowner, the Duke of Buccleuch and Queensberry, an extensive programme of industrial archaeology is underway.

A recognised charity, The Trust's income comes from tourists and visiting parties, industry, the Scottish Tourist Board, The British Library, The Pilgrim Trust, local authorities and community involvement.

Further enquiries may be made to: The Trust Adviser, The Wanlockhead Museum Trust, Goldscaur Row, Wanlockhead, Dumfriesshire.

## SWING BRIDGE CENTENARY

The Swing Bridge across the Tyne between Newcastle and Gateshead celebrates its centenary this year and is also being considered for Scheduling as an Ancient Monument. It was opened to road traffic on 15th June and to river traffic on 17th July 1876, construction work having started in 1868, and it is one of only a few nineteenth century hydraulic swing bridges still surviving in this country.

The main structure of the bridge, complete with its hydraulic equipment, is by Sir W. G. Armstrong & Co. of Elswick. Although the pumps were electrified in 1959, the original hydraulic engines continue in everyday use for swinging the bridge deck which is 281 feet long and weighs 1,450 tons. It was built by the Tyne Improvement Commissioners at a total cost of £233,000 and is probably the fourth bridge on the site.

## THE VICTORIA TUNNEL, NEWCASTLE-ON-TYNE

The Victoria Tunnel is an interesting structure remaining from the days of coal mining at the Leazes Main or Spital Tongues colliery. When the Lease for mining was granted to Messrs. Porter and Latimer commencing on 25th March, 1835, they were faced with the serious problem of getting the coal from the colliery to the Tyne to be loaded on to colliers.

Other collieries in the area, such as Elswick, had wagonways running to the river, but Spital Tongues was unfortunate in the fact that the city lay between it and the Tyne.

The owners had three alternatives. They could construct a wagonway to the west of Newcastle, possibly linking up with the Elswick wagonway which would have been the shortest distance. It would however, have been expensive as the coal would have had to be loaded onto keels (each of which could carry 21 tons of coal) since collier brigs could not pass under the low arches of Newcastle Bridge.

A wagonway to the east of Newcastle, either direct to the Tyne or linking up with the Newcastle and North Shields Railway which was completed in 1839, would have involved a long route with expensive wayleaves. It was also uncertain whether the owners would have obtained a wayleave over the Town Moor.

The third alternative was the one decided upon and that involved excavating a tunnel from the colliery under the centre of Newcastle to the Tyne close to the Ouseburn at the east end of Newcastle Quay. This was not a new type of mining project for Tyneside mining engineers, as a subterranean horse drawn wagonway had been commenced in 1770 from Kenton Colliery to the Tyne at Scotswood. This tunnel was commonly known as "Kitty's Drift" and was three miles long, being hewn out of solid rock. It was arched with brick or stone only in occasional places.

There is little contemporary evidence on the building of the Victoria Tunnel, but the construction appears to have gone smoothly taking two and a half years from 27th June 1839 to 8th January 1842.

The three men concerned were Mr. Gillespie, a well known engineer locally, John Cherry in charge of operations who was a pitman at Spital Tongues colliery and lastly David Nixon the Newcastle builder. The latter two, with possibly no experience of tunnel construction beyond digging of headings in mines, were perhaps fortunate in the choice of route since it seems likely they followed the course of an old stream through the city. This does not detract from their achievement as they worked through solid clay, and an artificially arched tunnel had to be constructed for the entire length of the tunnel, which was almost two miles, descending 222ft. in its passage from the colliery to the river. Its greatest depth is 85ft from the surface, and its outfall was near Glasshouse Bridge at the bottom of Tyne Street where it emerged on to two staithes built into the river.

The loaded coal wagons went down the incline of the tunnel under their own weight and were drawn back to the colliery by a wire rope attached to a stationary engine.

Due to the financial difficulties of the owners, the tunnel had a short working life and eventually in January 1860 it was closed. It remained so for nearly eighty years until 1938, when the City Engineer for Newcastle was considering plans for air-raid shelters. The digging of underground shelters (to be used as car parks in peacetime) was considered, but the fact that the depth of such shelters had been increased from thirty feet to fifty feet when dug in clay in order to ensure they were bomb-proof made this unfeasible.

At this stage, the Victoria Tunnel was found to fulfil all such bomb-proof requirements, and it was decided to use the tunnel for shelters in Newcastle. It was of major importance that the section under central Newcastle had a depth of about 40ft., sufficient to be considered bomb-proof. It was converted into an air-raid shelter at a cost of £37,000 and gave a seating capacity of 9,000 people. At the end of the war, most of the fittings were removed and all but one of the entrances were bricked up. The one remaining entrance was left in Ouse Street on private property. The central section passing under the centre of Newcastle is in very good condition.

The City of Newcastle upon Tyne as Agents of the Northumbrian Water Authority are commencing work during 1976 on the conversion of some 800 metres of the tunnel from Ellison Place to Queen Victoria Road into a sewer to replace the Pandon Sewer which is reaching the end of its useful life. By using the tunnel the City will save some £100,000 in excavation costs. As a result of the sewer works a new entrance to the tunnel will be available at the junction of Queen Victoria Road and Claremont Road to facilitate access for visitors to the western end of the tunnel.



The text for this article was based on The Victoria Tunnel by D. J. Rowe, which is included in Industrial Archaeology Vol. 7, 1971. Additional material was supplied by the City Engineer, Newcastle upon Tyne.

## WEBSTER'S ROPERY, DEPTFORD, SUNDERLAND

The history of this building, which fronts the River Wear east of the Alexandra Bridge, is somewhat obscure, but it is certainly the oldest factory building in Sunderland. It is a four storey dressed stone structure of impressive dimensions.

According to Surtees (History of Durham, published 1812) and later G. Garbutt (History of Sunderland, published 1819) the firm of Grimshaw Webster and Company opened a ropeworks at Deptford in 1797 in a four storey building of 100 by 30 feet, and the present structure appears to be approximately this date. It is shown on a plan of property at Deptford, dated 1801, lodged in Sunderland library and museum, and the library also has illustrated documents relating to the Fothergill Process, patented in 1793, which was used at the works. Thus it is believed to be the world's first Patent Ropeworks, i.e. not having a rope walk. Although the interior has been substantially altered it has been suggested that the cast iron window frames are probably original.

The building enjoys no statutory protection at present, and has remained derelict for many years. However, the owners, Sunderland Shipbuilders Limited., are now considering restoring it and putting it to industrial use once more.

By courtesy of Tyne & Wear Industrial Monuments Trust, Sandford House, Newcastle upon Tyne NE2 1ED.

## WHEAL MARTYN MUSEUM

Cornwall's newest Museum, opened in 1975 is the open-air site Museum of the China Clay Industry. Situated in the heart of the "Clay-country", it has been set up by the Clay producers to show the history of Cornwall's most important industry.

In a wooded 11 acre site at the head of the Trenance Valley, where clay has been produced for more than 150 years, a complete old clay works has been restored. Here you can see the huge granite walled settling tanks, working water-wheel and slurry pump, 220' pan kiln or "dry", horse drawn waggon and an 1899 steam locomotive used on the tramway from a clay pit. Indoors, a display traces the history of China Clay from 1745 to the present day, there is also an ever increasing collection of tools and machinery used in the industry and a small working pottery.

At Cathew, 2 miles from St. Austell on the road through Stenalees to Bodmin, the A.391.

## OFFICERS AND MEMBERS OF THE COUNCIL 1976-77

President:	Dr. R. A. Buchanan Centre for the Study of the History of Technology, University of Bath.
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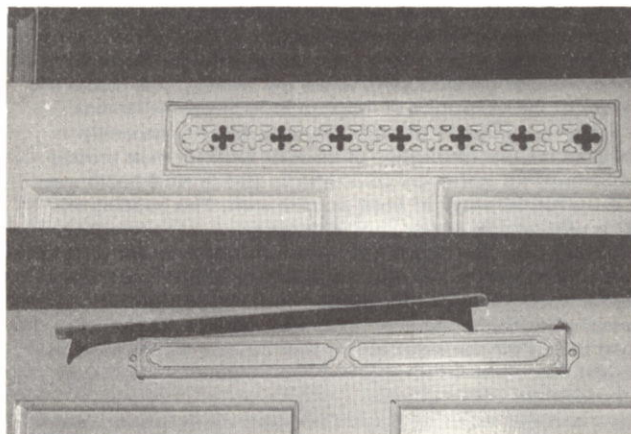
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Hampton



## IDENTITY UNKNOWN

A piece of domestic cast metal work which has so far eluded identification is fixed to the waiting room door of a doctor's surgery in St John's Wood, London. The top picture shows the hall side of the door, to which a cast iron grille, 455mm wide, is screwed. Seven of the fourteen cross-shaped holes have been blocked off. Behind each of the open holes, a circle of about 20mm diameter has been cut in the door. On the other side of the door is what amounts to a cast iron trough of L-shaped section, with both ends closed. It is 43mm high and 22mm deep. On top of the trough rests a metal bar with a blade, cast in one piece in what appears to be a copper alloy. The unpainted blade is normally concealed: in the bottom picture it has been propped up to show its shape. The blade has been machined so that it is fairly sharp: its points would make an indentation, comparable in size to that which could be made by a pencil lead. The cast iron on each side of the door incorporates the words PATENT and CURRALL'S.

The mystery is what it is — or was — for. The house dates from the second half of the nineteenth century and, so far as is known, has never been anything other than a residence and GP's consulting rooms. If the device is for ventilation, why the bar and blade? If the blade simply held something in position, why cut holes in the door? Why is the blade made of a non-ferrous metal and the rest of iron? Can any reader throw light on the subject?

Wendy Slemen (AIA), 212 Randolph Avenue, London W9 1PF.

## THE ARCHAEOLOGY OF WARRINGTON'S PAST

Archaeological Surveys Ltd., published 1976 by Warrington Development Corporation, P.O. Box 49, Warrington, Cheshire, £10.00

Warrington Development Corporation is to be highly congratulated on the lead they have taken in producing such a full survey of their area. The work is comprehensive, readable and will hopefully influence the way in which the New Town develops.

## HULL AND EAST COAST FISHING

By Gordon Pearson, 1976, published by the City of Kingston Upon Hull, Museums and Art Galleries, Town Docks Museum, Queen Victoria Square, Kingston upon Hull, HU1 3RA

This booklet is a commentary on the Fisheries Galleries of Hull Town Docks Museum, and carefully explains the various methods of fishing and the vessels employed.



## AIA CONFERENCE 1976

The Association's Conference this year was held at South Stoneham House, Southampton University, from 10th - 12th September, being attended by about 100 members and a strong local contingent.

The opening talk on Friday night was given, appropriately, by Dr Edwin Course of Southampton University IA Group, and local organiser for the Conference. He described and illustrated a wide variety of Hampshire's industrial monuments, ranging from agriculture, milling, brewing, and mineral working through metal industries and aerodromes to the public utilities. A film was shown of the Winchester Sewage Pumping Station in operation; here, domestic refuse was burnt to raise steam which in turn powered the works. On the Saturday morning, the IA of the neighbouring counties was described by Alf Cooksey (Dorset), A. J. Hazelfoot (Sussex), and Don Cross (Wiltshire). Each of these counties, commonly dismissed as "rural-agricultural", is actually endowed with substantial remains of industry, and it is good to know that there are IA groups engaged in their recording and preservation.

Ray Riley's talk on Portsmouth whetted appetites for the Saturday afternoon trip to the Dockyard, where the 'Victory' was passed by in favour of the block mills of 1802, built to house the famous block-making machinery of Marc Isambard Brunel — generally considered the first application of machine tools for mass production. Some of his machinery could also be seen in No.6 boathouse, still in use for the repair of small wooden craft. This building of 1843 is very soundly constructed with attractive stone facades and a cast iron frame. The girders have their safe load capacity — 40 tons — cast into the web. The fire station, built in the same year, is a fine example of cast iron framing used both for function and ornament. The great ropery of 1775, now a storehouse, was the longest building in the world at that time at 1095 feet. Many other 18th and 19th century buildings and stone-built docks remain in good condition.

A short boat trip led to the Royal Clarence Yard in Gosport, centre for victualling. More cast iron beams were seen in the 1853 granary. Nearby, the 1835 cooperage had closed a few years ago, but was filmed by the Navy while still working. It was a happy coincidence that among the members' contributions that evening was a film from Bryan Woodriff showing a cooper still at work in Kingston. On the Sunday morning, the LTC Rolt Memorial Lecture was given by Frank Nixon, a retired engineer and currently President of the Newcomen Society. Mr Nixon described his talk, Man and Machines, as a soliloquy with audience, and dwelt at length on the need for industrial archaeologists to understand more about the machinery they saw. Following this, the annual AIA Business Meeting was held.

The Conference formally closed at lunch, but additional afternoon trips allowed members to visit Southampton Docks and the tide mill at Ealing on Southampton Water, which is being restored by voluntary labour.

Thanks for a successful Conference and an enjoyable weekend are due to Fred Brook, AIA Conference Secretary; Edwin Course, the local organiser; and the deceptively unobtrusive efforts of his local helpers and the University staff.

Michael Bussell

## ANNUAL CONFERENCE, MANCHESTER, 1977

The Manchester Region I.A. Society will be hosts for the 1977 Conference to be held at Hulme Hall, University of Manchester, from Friday to Sunday, 9th to 11th September.

The programme of talks and lectures is expected to include :-

- Owen Ashmore on 'The Industrial Archaeology of the Manchester Region'.
- Richard Hills on 'Textile Mill Engines'
- David Owen on 'The North West Museum of Inland Navigation'.

The choice of excursions will include :-

1. Bridgewater Canal: Barton swing aqueduct, Worsley terminus. Boat trip from Manchester Docks to Barton.
2. Cotton mills and mill engines in the Oldham and Rochdale areas.
3. 18th Century cotton mill and community at Quarry Bank, Styal, Wilmslow. Working corn mill with two water wheels at Nether Alderley.

There will be an opportunity to visit the North West Museum of Science and Technology and an optional visit on the Sunday afternoon to sites in central Manchester.

The local organiser is Owen Ashmore, Department of Extra-Mural Studies, University of Manchester, Manchester M13 9PL. (Phone 061-273 3333, Ext. 165).

Detailed programmes and application forms will be available from the Conference Secretary, Fred Brook, 15 Widdecombe Avenue, Weeping Cross, Stafford.

## EAST MIDLANDS INDUSTRIAL ARCHAEOLOGY CONFERENCE

The next two conferences will take place on the following dates :-  
Saturday, 16th October, 1976, at Old St Peters School, Ruddington.  
Saturday, 14th May, 1977, at Burton on Trent.  
Full details of these conferences can be obtained from L. J. Stead, 48a Sandbed Lane, Belper, Derby (Belper 3782).

## INDUSTRIAL TRAILS

There is a growing demand among local history teachers, parties visiting Industrial museums, students in Industrial Archaeology courses, Librarians and others for brief guides or leaflets to the physical features of urban areas, which enable a variety of material to be viewed during a short tour of about two hours. These industrial trails or local history trails are designed to help the user to recognise important features, to point out the most convenient route and to give essential background information.

In the Manchester Region, several organisations have produced trails. These include the N.W. Museum of Science and Industry, The Civic Trust and the Arkwright Society. Another series is available from the Wilmslow Historical Society (which includes Nether Alderley). Most trails sell at between £0.10 and £0.20 per copy. Trails are of two types, walks and longer motorised excursions. Others are being collected together as guide books, e.g. P. Atkins "Walk Across Manchester".

Some observations on the problems and limitations of this type of information might be made. Descriptions have of necessity to be a blend of historical background, maps, diagrams, notes on architectural features and structures. Lack of space means that the number of features that the visitors attention is drawn to can only be very selective either for the whole area or for any one relic. It is therefore essential that further references should be included and other publications read in conjunction with the trail leaflet. An example is the Arkwright Society's trail of Cromford Village which must be supported by the Society's "Arkwright and the Mills at Cromford" for a complete understanding. Similarly, the Civic Trust's "Worsley Heritage Trail" (which deals with the Bridgewater Canal at Worsley) is most useful if used in conjunction with the Manchester Ship Co.'s folder "The Aqueducts at Barton".

One difficulty is the problem of access. Several interesting features en route are usually associated with premises not open to the public. This is the case both with the Ancoats Industrial Trail (Education Service, N.W. Museum of Science and Industry, Manchester) where it is not normally possible to examine the internal structure, or other than the facades of Messrs. A. & G. Murray's Mills, probably the earliest surviving in the city; and again with the shortly to be issued Knott Mill — Piccadilly Industrial Trail, which follows the line of the Rochdale Canal Extension. Police advice is that there is no automatic right of access to a canal towpath and so this cannot be advertised and the trails deviate as required. Trails thus have to confine themselves to what may be viewed from street level. Some trails, like educational aids, raise more questions than they answer. Here, the advantage of knowledgeable guides being on hand for parties new to the area must be stressed. Local and Civic societies, industrial, historical and archaeology groups are often willing to do this if approached.

Finally, a word of advice to groups contemplating the production of trails. Field work should be undertaken first and visits to premises negotiated. Next research your most interesting discoveries with the aid of maps, directories, biography and histories. Thirdly, try out the draft of your trail with a number of different groups or parties of adults, students etc. Very often useful supplementary observations and information will be gathered which the author has missed.

A. D. GEORGE, Manchester Region I.A. Society, 30 Kingsway, Worsley, Manchester.

AIA Bulletin is published six times a year by the Association for Industrial Archaeology. The Association was established in September 1973 to promote the study of Industrial Archaeology and encourage improved standards of recording, research, publication and conservation. It aims to assist and support regional and specialist survey and research groups and bodies involved in the preservation of industrial monuments, to represent the interest of Industrial Archaeology at a national level, to hold conferences and seminars and to publish the results of research. Further details of the Association and its activities may be obtained from the Secretary, Association for Industrial Archaeology, Church Hill, Ironbridge, Telford, Salop, TF8 7RE, England (095-245 3522).