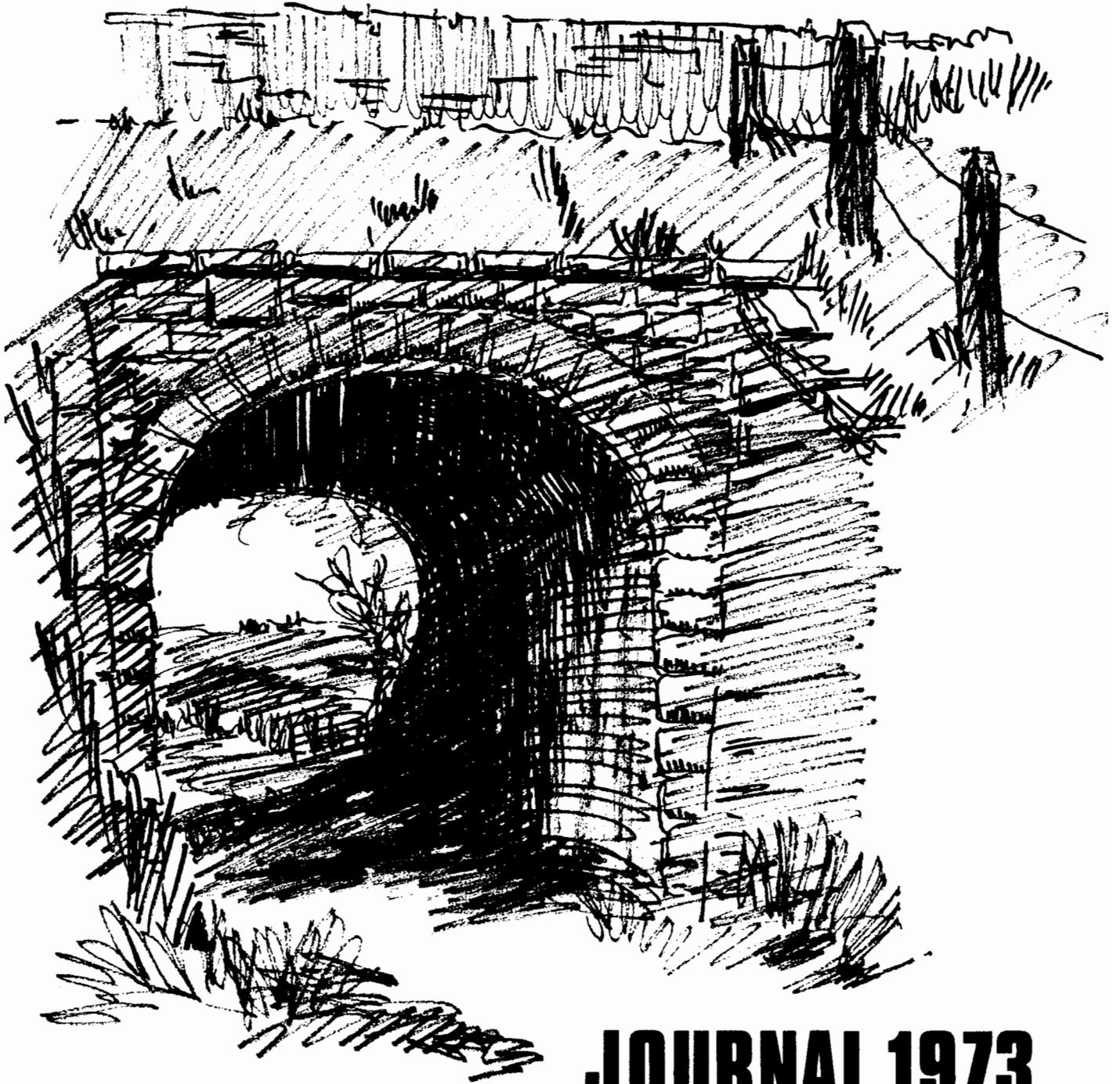


# GSIA



**JOURNAL 1973**



The aims of the Society shall be to stimulate interest in, record, study and where appropriate, preserve items of industrial archaeology particularly in the county of Gloucestershire.

Cover Illustration.

We are indebted to J.P.G.Lane T.D. for kindly allowing us to reproduce his original drawing of the bridge at Nailbridge over the disused track of the old G.W.R. line that ran from Ross to Cinderford. The Gloucester-Monmouth road crosses the bridge.

# GSIA

GLoucestershire SOCIETY FOR INDUSTRIAL ARCHAEOLOGY

# 1973

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2

# GLOUCESTERSHIRE SOCIETY FOR INDUSTRIAL ARCHAEOLOGY 1972-3

President..... David Verey

Chairman..... David Bick  
& Editor of  
the News Sheet.

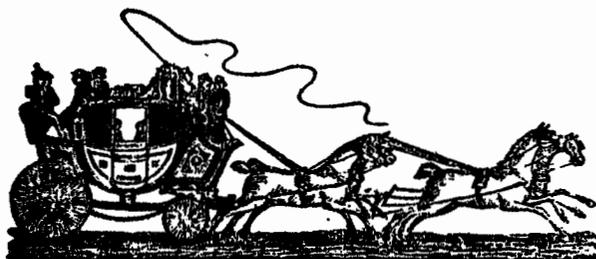
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J.E. Tyrer  
L.P.J. Tolroad

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The Editor is always pleased to receive articles, reports, and correspondence for the Journal; also suggestions for its improvement in any way - to 5/7 Montpellier Street, Cheltenham. Tel. 25086.



## EDITORIAL

Our year 1972/3 began, and is ending with, events important to the Society. 1973 gave us the opportunity to meet our new President Mr. David Verey A.R.T.S.A. Mr Verey will be well known to our members in Gloucestershire for his restoration of the very beautiful Arlington Mill at Bibury. Our more distant members are more likely to know his two volumes on Gloucestershire in the "Buildings of England" series, and his book on S.W. Dawkes the architect of the Cheltenham-Birmingham Railway. We are delighted to welcome Mr Verey as our President.

The other event I hardly dare to name lest nemesis even yet overtake our endeavours. All being well the "Gazetteer of Industrial Sites in Gloucestershire" edited by the Rev. W.V. Awdry should be published before the end of the year. The compilation of this Gazetteer has been a major effort by a number of our members over a period of several years. It is published in conjunction with the Local History Committee of Community House, Gloucester and is quite a landmark in the work of our Society.

Having covered the momentous events of the year perhaps I may be forgiven for turning to a very minor one - that I am wearing two hats. Since the practise is not uncommon in the Society, it should come as no surprise to members to find their Hon. Secretary writing this editorial. Howard Pullan, in the past, and David Bick, at present, both, like kings of Egypt have worn double crowns.

As no editorial has been written in a major publication of the Society since February 1970, it may be informativ-

to recap the position.

From 1964 to 1970 the GSIA produced a series of publications under the title of "Newsletter" and the Society has always owed a considerable debt of gratitude to Neville Crawford who throughout the whole of this time so ably bore the task of editorship. During those years it was the Newsletter more than anything else, which held the Society together and there are still many members, outside the county, with whom the publications are our only contact.

In 1971 it was decided to produce only one publication a year, to be known as the "Journal". This was to be augmented by a News sheet sent out several times a year, as required, and edited by David Bick. The idea being that it would keep members abreast of current events and contain the more ephemeral items, which they would not necessarily want to keep. This seems to have proved a very successful system, and has added much to the liveliness of the Society.

This is the third year the Annual Journal has appeared and it is hoped that members will now feel it has crystallized into a satisfactory format. The contents, of course, depend on what our members produce for publication.

It has always seemed to me that one of the most important functions of the GSIA was in the publications field, both in stimulating interest and in acting as an outlet for articles which members write and may have no other means of getting into print. In actual fact we seldom find that articles pile up waiting for us; it is more a question of clawing papers out of our members and begging them to put their knowledge and research into written form. On reflection perhaps this is even more valuable since in this way articles are produced which otherwise would never see the light of day.

On looking through earlier Newsletters of the Society the preponderance of articles dealing with the Stroud area was most noticeable. Recent publications have done much to redress this balance; perhaps the series of lectures in Cheltenham, which began with an experimental six in 1965/6, have had something to do with this. At all events the scales have been so tipped away from the Stroud valleys, that it seems high time we again heard something from our Stroud members.

Both in fieldwork and research the area must present almost an embarrassment of riches. Have we, for instance,

any member interested in Netherlypiatt? If so they might like to concern themselves with a tenement with two fulling mills, and lands called the Moores, with entrance and egress to and from two racks standing in the Bourne Land, which in 1689/90, during the reign of William and Mary, was let for £10.15s yearly... "and a couple of good hens." (Glos. Library, Brunswick Street, Gloucester. Glos. Collection of Deeds. Bisley 46/3) A combination of map research and fieldwork might locate the site or even the building.

Our grateful thanks go to all the contributors to this years Journal. It is of particular interest to have professor Tucker's history of the Gloucester firm of Wm. Gardner. Perhaps our "advertisement" pages will inspire other members to research more local firms. I should also like to thank Mrs P. Lebbon who again helped me by typing a section of the Journal.

Although there seems to be a good deal of interest among members, sufficient material did not come in to warrant a section on the agricultural machinery of the county. But may we hope to defer rather than abandon this scheme?

In 1964 a group of members carried out a survey of Gun's Mill, a 17th century blast furnace, in the Forest of Dean. Rough drawings were made and Warren Marsh published brief notes on the history of the site in Newsletter No. 3 November 1964. It has always been hoped that someone would one day produce finished drawings. Earlier this year Ian Parsons took up his drawing board and has all but completed the work. We intended to print them in this Journal, but, with regret, postponed publication for twelve months, since it was felt that the area being one of considerable importance, was worthy of a more comprehensive project; one that would draw together all the known historical information on the site. May we hope that we can complete this for the 1974 Journal? Just ten years after the first measurements were made ! A fitting anniversary which will also mark the 10th year of our Society.

---

The Editorial does not necessarily express the views of the Committee.

## correspondence

Arising from the article in last year's JOURNAL on the early years of the Cheltenham Gas Light and Coke Company.

Mr John S. Allen of the Horsley Company wrote relative to the Gas works article; including the following paragraph which may be of general interest.

"Until we transferred them very recently to the Stafford Record Office we held the records of all the Thomas Piggott gas holders built from 1845 onwards together with their place of building. Unfortunately many of them do not record the customer and place of building. We looked through our files but none are recorded at Tewkesbury and Cheltenham."

8 Cranleigh Gardens  
Stoke Bishop  
Bristol.

Dear Miss Chatwin,

I have just read with interest your article on "The Early Years of the Cheltenham Gas Light and Coke Co." in the current issue of the GSIA Journal...

I fear I am concerned mostly with what might be called the trivia of I.A., for buildings interest me more than processes ..... and the minor features of them in particular. So I was interested and surprised to see, in the drawing reproduced from the 1845 "Guide", the clock tower surmounted by what seems to be a replica of "our" lamplighter weather-vane.

I have long been familiar with the figure which used to be on top of the old premises of the Bristol Gas Co. in Avon Street, and which has now moved with the company to their new quarters in Bedminster, I always thought it unique. My faith is now slightly shaken and I am left wondering whether your lamplighter was copied from ours or vice versa or even if it was the conventional design for a Gas Company.

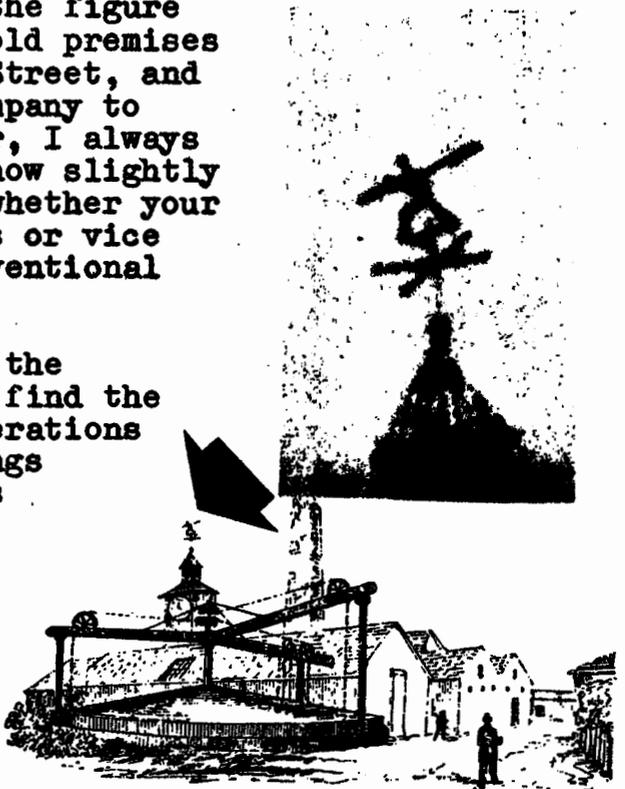
Do you know if yours dates from the start of the Company in 1818? I find the Bristol Gas Light Co., began operations in 1816. The Avon Street buildings (according to Buchanan & Cossens "I.A. of the Bristol Region") were erected in 1821 and I presume the figure was put up then. It would be interesting to know which of the two is the older.

Does the Cheltenham one survive and, if so, where is it to be seen?

I hope you won't think me a nuisance with my enquiries!

Yours sincerely,

Barbara Sydenham.



Far from being a nuisance Miss Sydenham I was delighted that you had the knowledge and wonderful eyesight to recognise the weather-vane for what it was. The points you raise are most interesting. Enquiries, so far, have failed to produce the weather-vane or to throw any further light on it. I enjoyed going to see the one at Bristol and reproduce a photograph of it here; also the weather-vane from the print in the 1972 Journal, taken under magnification. Allowing for artists licence and the small scale of the drawing, it seems your assumption that both are of the same design is undoubtedly correct.

A.C.

## **GSIA SUMMER EXCURSIONS**

The Spring and Summer excursions seem better than ever, thanks to Neville Crawford and Harry Townley, who thought up where to go, aided by the Committee. The organisation of these outings has been a great deal of work for Mr Crawford and I am sure everyone who has participated will be grateful to him.

Our thanks are also due to all those members of our own and other Societies who gave up their time to lead these visits; particularly one of our members Michael Bussell who is also active in GLIAS and Paul Carter who made the day to London so successful.

Very gratifying this year has been the collaboration of other Societies. A number of members of the Bristol Industrial Archaeological Society joined our walks around Sharpness and Gloucester.

The visit to Stanley Mills was arranged by the Stroud Museum Association and our members attended at their invitation. We hope we can reciprocate next season.

On June 27th the Worcester I.A. and Local History Society organised an evening picnic at Croome Court near Pershore. This is something we should like to repeat, mainly because the weather was so inclement. Three car loads from GSIA braved the torrential rain which lasted all evening to join quite a number of parties from Worcester. The grounds of Croome Court are most delightful, we picniced in the orangery (with a welcome roof over our heads!), stood packed under umbrellas to hear Mr Gwilliam talk about Croome Court, and slithered our muddy way to the Grotto, where sodden stone nymphs stoically reclined, watching raindrops making rings on an even more watery pool. Thank you Worcester - we enjoyed it!

The Editor

#### ARCHAEOLOGISTS SEE LITTLE-KNOWN LONDON - 14 APRIL

Forty members of the Gloucestershire Society for Industrial Archaeology thoroughly enjoyed their first excursion of 1973.

It was also the first time the Society had visited London, when, thanks to members of the Greater London Industrial Archaeology Society, local members were able to penetrate parts of the city little visited by tourists, including the riverside area of Wapping, where wholesale demolitions are taking place, and the St Katharine's Docks, which are being converted into a Marina and Exhibition Centre.

The tour commenced with a visit to the Metropolitan Water Board's pumping station at Kew Bridge, where six steam pumping engines are preserved including what is most probably the largest Cornish beam engine still extant. It was built by Harvey's of Hayle, Cornwall, in 1871, and has a cylinder of 100 inches in diameter.

East End and industrial housing of the 1850s in Tower Hamlets; the Hampstead Road basin of the Regent's Canal, and "Blow-up Bridge" by Regent's Park, were also seen. This was so-called because an ammunition barge exploded under it and wrecked it in the 1870s.

#### BUSY WEEK FOR THE SOCIETY - 2 MAY

Members of the Gloucestershire Society for Industrial Archaeology have just had a busy week, with a visit to a historic cloth mill, followed by a day exploring industrial remains in the Lower Wye Valley.

The visit to Stanley Mill, King's Stanley, was led by Mr Lionel Walrond, curator of Stroud Museum, who outlined the history of mills on the site.

The visit to the Lower Wye Valley was led by Professor D G Tucker and fell into three main sections - the iron and wire making industries in the Angidy valley west of Tintern; the papermaking industry in the Whitebrook valley; and the miscellaneous industry at Redbrook.

Other members of the Society are working on the old quarry tram-roads on Ledkhampton Hill, uncovering the stone sleepers which carried the "Plates" of the track.

## EXPLORING THE MYTHE - 22 MAY

Led by the secretary, Miss Amina Chatwin, some two dozen members of the Society spent an enjoyable evening exploring the Mythe area of Tewkesbury.

Telford's bridge, built in 1824, was the first point to be visited, where the party examined the bridge, the Gothic Toll house and the matching ticket office on the opposite side of the road.

After a short climb to the top of the Tute of Royal Hill, so called because of the visit there of George III in 1788 to see the view, the party descended to the river bank, pausing at King John's Castle on the way. This involved walking down Paget's Lane, which was the main road to Worcester until 1750, and crossing the derelict Tewkesbury - Malvern railway line. This line had a life of exactly a hundred years closing in 1961.

The party then walked to the site of the Mythe Brickworks; for over half a mile along the east bank of the Severn are water-filled clay pits, relics of the three Red Pools brickworks disused for over a century. Here the party saw the remains of three houses which formed part of the brickworks. Miss Chatwin has been able to trace the earliest of the brickfields back to 1634.

## CROWDED DAY IN PEAK DISTRICT - 10 JUNE

Members of Gloucestershire Society for Industrial Archaeology enjoyed a varied day in the High Peak district of Derbyshire.

They went to William Strutt's 1803 fireproof mill at Belper and then to Cromford where they saw Sir Richard Arkwright's first cotton mill, corn mills, church and mansions, and Willersley Castle.

The old railway workshops at High Peak junction were visited next, followed by Middleton Top Engine House, which contained an 1829 double-beam engine, restored by Derbyshire Archaeology Society.

The day was rounded off with a trip to the Crich Tramway Museum where members rode on one of the museum's fleet of 40 restored trams.

## BONUS TOUR OF RUSSIAN SHIP - 17 JUNE

A large party of members of Gloucestershire Society for Industrial Archaeology and their families started off their visit to Sharpness Docks on Sunday with an unexpected bonus.

Thanks to the kind co-operation of Mr B J Evans, Security Officer for the importers, they were allowed on board the Russian timber ship,

Semyon Kosinov. The ship is registered at Leningrad, has a gross tonnage of 4,482 and is almost 400 ft long with 55ft beam. Mr Evans also showed his unique collection of photographs of the docks and shipping extending over 50 years.

Under the leadership of Mr Ian Parsons, the party visited the original entrance arm of the Gloucester and Berkeley Canal, now used for yacht moorings, remains of the elevated rail system which used to convey wagons to the coal drops, the last of which was demolished a few months ago, and the tidal basin and entrance locks.

Mr Parsons said the quays extended over 12,000 ft and the minimum depth of water was 21ft 6 ins, accommodating ships up to 5,000 tons. At one time Sharpness was the third largest timber importing port in the country, and imports had always exceeded exports.

A recent development is a container terminal used mainly for trade with Ireland.

#### NORTH WORCESTERSHIRE - 8 JULY

The 'Highlight' of the excursion to North Worcestershire organised by the Gloucestershire Society for Industrial Archaeology on Sunday was a trip through the recently re-opened Dudley Canal Tunnel. Unfortunately the limited accommodation in the 'Joey' boat meant that only the first fifty could be accepted for the trip and nearly as many again were unlucky.

The 3154 yards underground took some two hours and several members tried their hand, or rather legs at 'legging' the boat along in the traditional way, the use of engines being prohibited in the tunnel because of ventilation difficulties. Members were well able to appreciate the initiative and daring of the early tunnellers who started digging the canal under Dudley Hill to open up limestone quarries as far back as 1775; as well as the hard work of the Dudley Canal Trust in clearing vast quantities of mud out of the canal and basins.

The party then visited the Forge Mill Needle factory at Redditch where the warden, Mr J Rollins, explained the complicated processes and members were able to see the water-driven machinery in motion. The original mill was owned by the neighbouring Bordesley Abbey, as sister abbey of Flaxley and Tintern, from which the interest in wire-working would have come.

The day was completed by visits to the contrasting Avoncroft Museum of Buildings at Stoke Prior and the Norton Collection at Upton Warren. Here a considerable amount of Victoriana has been amassed, including early phonographs, sewing machines, hand operated cinema projectors, carbide lamps, gramophones, wireless sets, musical boxes and a street barrel organ, several of which were demonstrated by Mr Norton.

Ten days earlier a score of members enjoyed an evening picnic with members of the Worcestershire I A Society at Croome Court. They saw the exterior of the house, decorated by Adam, and the grounds, lake and grottos created by "Capability" Brown out of a swamp. The imposing Adam Orangery provided shelter from the heavy rain for the picnic.

## N C FERRY

### COALBROOKDALE - 29 SEPTEMBER

Our visits to Coalbrookdale seem to be almost an annual event. Open air Museums are in fashion now, but surely nowhere in Europe could begin with such a head start as Coalbrookdale. The first cast iron bridge in the world and Abraham Darby's old furnace, where in 1709, he was the first man to successfully smelt iron ore with coke instead of the traditional charcoal. The iron bridge was cast in 1779 by Abraham Darby III who had to extend his grandfather's furnace so that the main ribs, which were nearly 81 feet long and weighed over 5 tons, could be cast in one piece. This in itself might be sufficient to entice us to this beautiful wooded Severn valley but there is so much more besides. Nowhere else evokes quite the atmosphere of the 18th century when industry still went hand in hand with a rural setting. To walk into the courtyard surrounded with low mellow brick buildings and overgrown bottle kilns at the old Coalport china works is to go straight back two hundred years.

At a recent Museum Open Day the Coalport China Firm were persuaded to demonstrate the making of china here, and display some of their wares. Long before the day was over they were frantically sending for replenishments and ended by selling, I believe it was, some £3,000 worth of stock. So who knows, perhaps we should enjoy the quiet charm of these deserted buildings, sleeping by the river, before they once again teem with a new life and industry.

Rose Cottage a half timbered building now undergoing very thorough restoration, indeed it looked problematical whether it was going up or coming down, was thought to have been built in 1642, but a date on a hidden beam now places it at 1638. It is hoped that when complete it will house a Smith who will work in a nearby building, and that eventually perhaps a suitable furnace will be found for Coalbrookdale so that puddled iron can be produced on the site and the processes be followed through to completion.

To visit the Museum of iron objects at Coalbrookdale is always a pleasure and one marvels at the intricacies of all the Victorian castings. We were fortunate in having Audrey Morton to show us round. It is largely due to the original forethought and enthusiasm of her husband, the late George Reginald Morton,

that we can today visit Coalbrookdale as a whole and find it a living relic of the past.

The Open Air Museum section at Blists Hill goes on apace. A scene of great industrial activity in the 19th century, the remains of blast furnaces can still be seen, and a massive vertical blowing engine has been erected in the North Engine House. A short distance away the famous Sampson and David horizontal beam engines are under a roof covering. Some of us will remember them in their original home at Lilleshall on an early GSIA visit. Surely the Coalbrookdale site is unique in that one can see not only the original Darby furnace, but follow through the technology with the 18th century cold blast Bedlam furnaces (made famous by de Louthembourg's red glowing painting) to the hot blast 19 century furnaces at Blists Hill.

On the way up to the Canal, a craftsman potter can be seen at work, and a building has just been completed to house a fine collection of type and become a print house. On the far side of the Canal old brick buildings were once a tile manufactory which may one day form part of the Museum.

The cleared section of the Shropshire Canal is quite idyllic and leads to the Hay Inclined Plane which enabled tub boats to be carried from the canal to the river on a lift powered by a steam engine. At the bottom of the incline the tar tunnel is located.

Help is being given by the Historic Buildings Council to restore Madeley Court, once the home of the Darbys, which may eventually become a top quality restaurant and house an important collection of Darby relics. There seems no end to the vision and energy of those who run Coalbrookdale.

#### GLOUCESTER - 14 OCTOBER

A large group, including about a dozen BIAS members, made a tour of IA sites in Gloucester. Assembled at the north entrance of the docks within site of the Old Customs House, Neville Crawford pointed out that here and northwards along the river was the site of the old quay and the earliest of Gloucester's industries, flour mills, sugar refining, pin making and founding. The last of the bell founderies, more centrally situated, was now the site of the post office in King's Square. Looking northwards along the empty river banks it was not easy to realise that this had once been one of the busiest parts of the city, with a castle overlooking all and the river crowded with ships.

Walking up Commercial Road the party passed the old Worcester Salt Warehouse on the left, near the Customs House, and had a good view of the Victoria Docks on the right.

With the opening of the Gloucester and Berkeley Canal the centre of industry shifted southwards, with timber wharves; Moreland Matches and a bottling plant were among the firms in the vicinity.

On the way to the central area of the docks, the group stopped at a furniture store on the corner of the main street with good ironwork decorating the top of the building, and crossing Southgate Street went to Old Tram Road, where the grooves marking the position of the plateway of the Gloucester-Cheltenham Railway may still be seen.

Once in the docks Ian Parsons explained that 1826-7 saw the completion of the Canal and the main dock basin. The oldest range of warehouses, on the north, date from the same period. The internal construction of the various warehouses, mainly from the middle of the century, are of interest. The design, which is also found in Sharpness, was so successful that it was repeated from about 1836 to the 1870s. Because of poor foundations on which to build, inverted brick arches were used to spread the load over a wide area in supporting interlocking cast iron columns through the five storeys of the buildings. The port is still in use, ships bringing in fertiliser from Holland; others bring Guinness from Dublin and return with car parts.

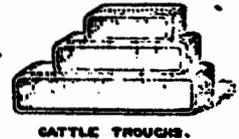
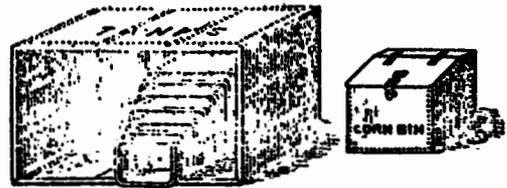
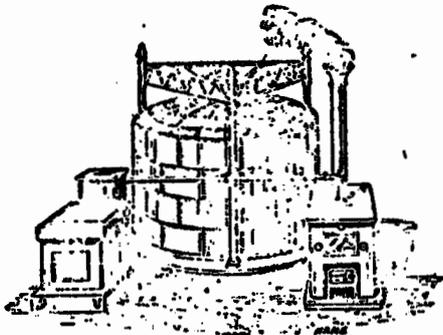
The new swing bridge must make Dutch sailors feel at home, being very reminiscent of bridge design in that country. As if to order, it swung open just as it was mentioned, letting in two small craft and quite a large vessel from Holland. Excitement was laid on too, when one of the small boats, up from Lydney, stopped with engine failure, right across the bows of the fast oncoming Dutchman. The large vessel seemed at first oblivious of the frenzied and rather pathetic hooting of the small boat and disaster was only narrowly averted. It was noticeably BIAS members who rushed to throw out lines and pull in the small craft living up to a reputation of making all ship shape and Bristol fashion.

The Mariners Chapel was passed and also Fielding and Platt, foundry and machine makers, also maltings and what had originally been an oil crushing plant. Thence to the famous Pillar Warehouse of 1836 with its cast iron columns.

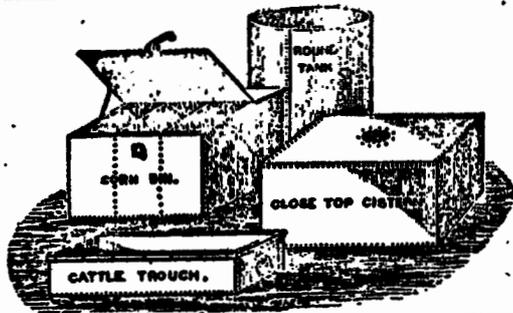
The party then walked to Llanthony lock which once handled the coal trade from Bullo Pill and Lydney. Fishing nets hung from the trees of a nearby orchard recalling 18th and 19th century riverside prints or drawings by William Pyne.

The interesting afternoon was completed on the railway line, when the Rev W Awdry outlined the history of Gloucester's various Railway Companies and in particular the famous break of gauge.

Amina Chatwin



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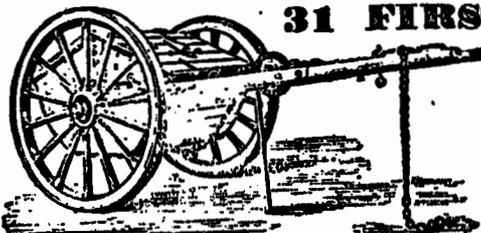
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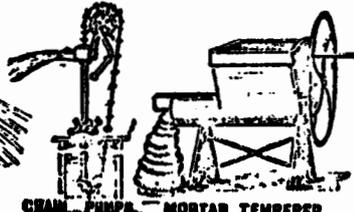
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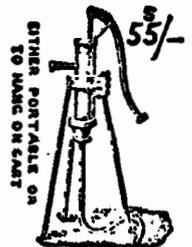
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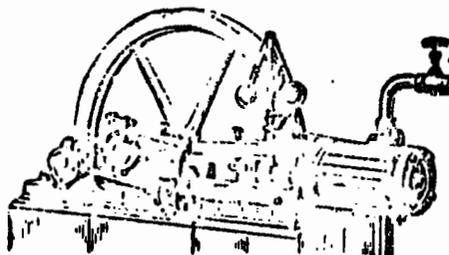
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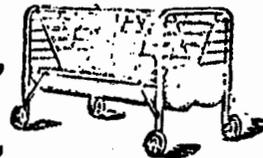
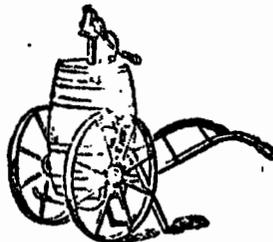
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CORN BINS, WHEELBARROWS,

Iron Hurdles, Continuous Fencing &c.



*Descriptive Catalogue upon application.*

1702

THE IMPLEMENT AND MACHINERY REVIEW.

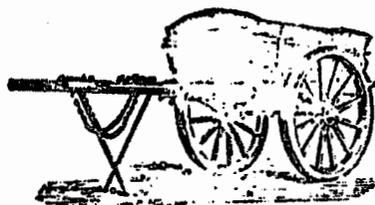
Aug. 2, 1878.

**THE BRISTOL WAGON WORKS COMPANY,**

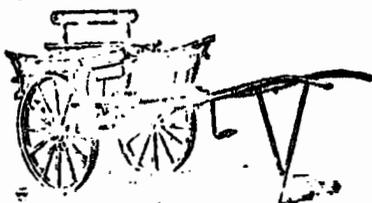
LIMITED, BRISTOL,

MAKERS OF

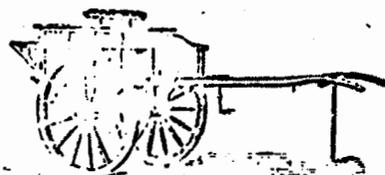
**CARTS AND WAGONS OF ALL DESCRIPTIONS.**



FARM CARTS.



LIGHT SPRING TIPPING CARTS.



SPRING MARKET CARTS.

Farm Carts, Builders' Carts, Contractors' Carts, Harvest Carts, Cattle Carts, Millers' Carts, Grocers' Carts, Brewers' Floats, Crank Axle Carts (for Wine Merchants, &c.), Light Spring Tipping Carts, Spring Market Carts, Dog Carts, Croydon Cars, Coal Carts, Ash Carts, Sanitary Carts, Water Carts, Farm Wagons, Millers' Wagons, Delivery Vans, Brewers' Drays, Trolleys, Light Spring Vans, Furniture Vans, &c., &c.

**FULL CATALOGUES FREE ON APPLICATION.**

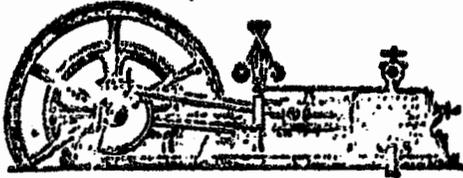
**GOOD TRADE TERMS.**

THE BRISTOL WAGON WORKS COMPANY, LIMITED, are about the largest makers of Carts and Wagons in the United Kingdom, and can offer the best material and workmanship, at a very low price.

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# Alexander & Son, Corinium Works, Cirencester,

ENGINEERS, IRONFOUNDERS, & BOILER MAKERS,  
MANUFACTURERS OF HIGH-CLASS MACHINERY FOR HOME OR ABROAD.



**ALEXANDER'S HIGH-PRESSURE  
EXPANSIVE STEAM JACKETTED  
HORIZONTAL ENGINE.**  
I. H. P. from 60 to 130.

The above Engine is one of the best that can be manufactured, attention being paid to every detail, both in design, material, and workmanship.

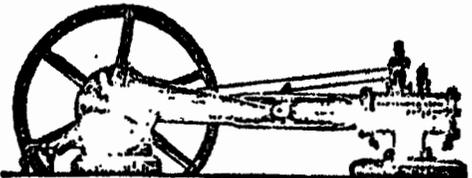
"We illustrate this week above, and on page 207, a horizontal engine and boiler which are well worth notice as favourable examples of modern mechanical engineering."—*Engineer*, March 22, 1872.

The above engines, of 20, 25, and 30 nominal horse-power, have been supplied to several firms in England and abroad, and have given great satisfaction.



**ALEXANDER'S  
NEWLY DESIGNED  
VERTICAL  
ENGINE AND BOILER.**

The larger sizes of this engine are now made in combination with the "Girder" Engine, and fitted with Alexander's Patent Annular Water Heater, and are confidently stated to be the best and cheapest engines of their kind before the public.



**ALEXANDER'S ORIGINAL  
"GIRDER" ENGINE.**  
A THOROUGHLY GOOD ENGINE AT A LOW PRICE.  
I. H. P. from 4 to 45.

Large numbers of this engine have been sold, and have given the greatest satisfaction.

"A very neat little engine, designed to contain the smallest number of working parts consistent with easy adjustment of those details undergoing friction, and to combine strength, durability, and simplicity of design with lowness of price."—*Engineer*, December 11, 1874.

"One of the most complete as well as convenient and compact engines ever produced."—*Implement Manufacturers' Review*, December 1, 1875.

**ALEXANDER & SON ALSO MANUFACTURE SUPERIOR PORTABLE STEAM ENGINES,**  
Fitted, without extra cost, with their **PATENT ANNULAR WATER HEATER**,  
which has been proved to effect a saving of at least 13 per cent. in fuel, according to experiments which are fully recorded in the *Engineer Journal*, March 22, 1872.

**ALEXANDER & SON ARE PATENTEES AND SOLE MANUFACTURERS OF  
SMITH & ALEXANDER'S "TWIN" MULTITUBULAR BOILERS,**  
Which have the following pre-eminent advantages, and are admirably suited for export. They are the lightest and smallest of their power that can be constructed, they are of short length (thus avoiding the dangers of unequal expansion and contraction), having no internal furnace flue, no seam or rivet exposed to the fire, which being at the side between the two boilers, causes a most efficient circulation and rapid evaporation. There is a fire-brick combustion chamber at the back, which consumes smoke and maintains constant temperature, and ample draft is procured by a chimney of sheet iron, twenty to thirty feet high, avoiding the need or cost of tall chimneys or heavy masonry for setting.

Wherever supplied they have been approved, and the highest testimonials can be seen.

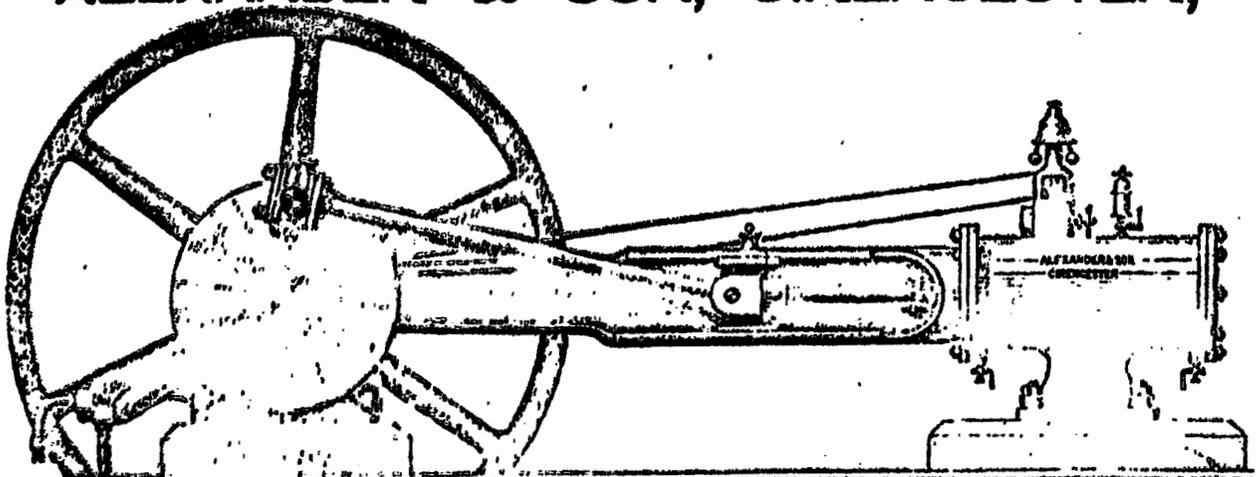
**ALEXANDER & SON ARE MANUFACTURERS OF THE NEW "COLLEGE" CAKE BREAKER,**  
As supplied to the Students of the Royal Agricultural College, Cirencester.  
Wholesale Terms. Catalogues and Testimonials on application.

April 1, 1876.

THE IMPLEMENT MANUFACTURERS' REVIEW.

DECEMBER 1, 1875.

**ALEXANDER & SON, CIRENCESTER,**



**MANUFACTURERS OF THE CELEBRATED "GIRDER" ENGINE,**  
SECURING SIMPLICITY OF DESIGN AND LOWNESS OF PRICE.  
WHOLESALE TERMS. PRICE LISTS ON APPLICATION. 4 to 45 I.H.P.