

BIAS NEWS AND NOTES

BIAS has continued to grow, although not as rapidly as in its first year, and to consolidate itself. Membership (fully paid-up) stood at 132 in November 1970, and the Committee is endeavouring to increase the extent of institutional membership by inviting leading firms in the Bristol region to participate in the activities of the Society. The Society has had a run of bad luck with illness of its members this year, including our Chairman, Douglas Jeffery, and Roy Day, Tony Woolrich, John Cornwell and Mrs. Marian Thomson, to whose sterling secretarial services the Society has owed so much. To all of them our best wishes for their full and speedy recovery to good health.

The 1969-70 programme of Extra-Mural Board lectures was upset by accidents and weather, but was brought to a satisfactory conclusion in April when Robin Atthill, snow-bound in February, managed to give his talk, the substance of which forms a feature in this **Journal**. The 1970-71 series of lectures got off to a good start in October with a talk from Michael Rix entitled "Cast Iron its own document". The lectures have provided a means both of having excellent and widely known speakers to address the Society, and of giving the Society some publicity as the class has not been confined to Society members, and it has been advertised in the Extra-Mural Department literature. We are grateful to Mr. Peter Fowler and Bristol University for their generous co-operation in this venture.

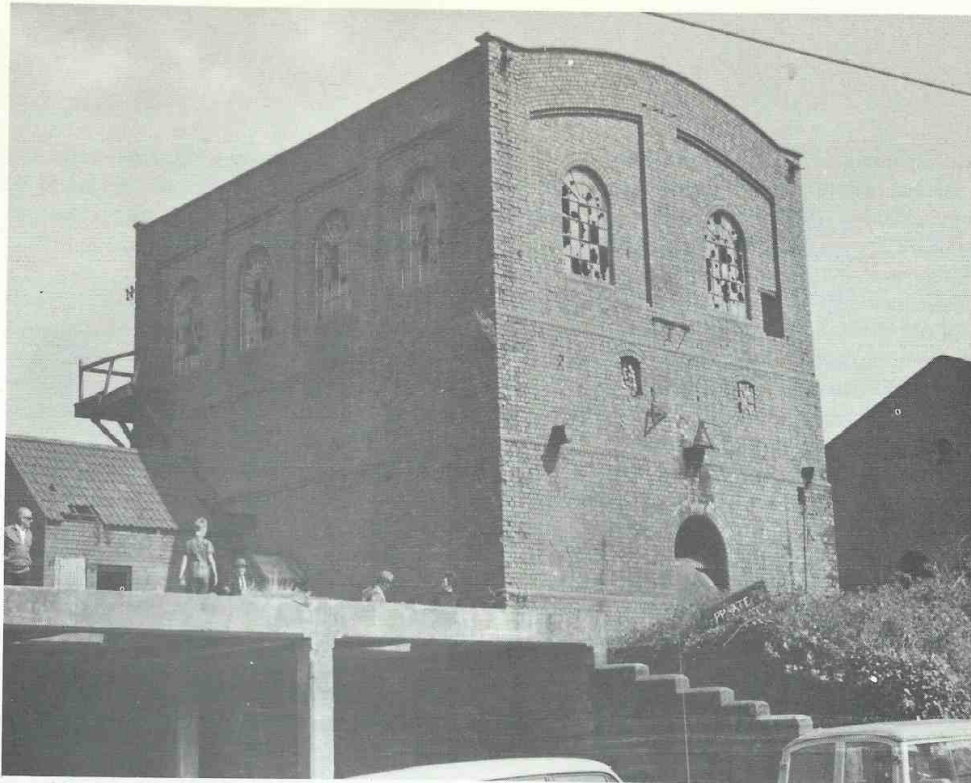
The Society has held an interesting series of meetings of its own during the year, including Field Parties such as a visit to Avonmouth Docks in February and a search around the collieries and tramways of the Radstock and Writhlington areas in March. During the summer there were visits to the mills of the Bristol Frome, Clevedon Pier, and Pensford and Bromley collieries, the latter being led by Mr. A.H. Parsons and being the basis of a short article in these pages. Clevedon Pier, incidentally, became an item of national news in the autumn, when two spans collapsed during a routine test of its structure on 16 October. The pier is 101 years old and it is an elegant addition to the Clevedon waterfront, so that its repair and restoration have become an urgent matter of local concern.

The outstanding industrial archaeological event of the summer was the return of the s.s. *Great Britain*

to Bristol. We have witnessed the successful completion of a salvage operation which seemed almost unthinkable only a few years ago, thanks to the financial backing of Jack Hayward, the technical expertise and initiative of Dr. Corlett, and the skill of the salvage team. The great iron hull was brought back from the Falkland Islands mounted on a pontoon, *Mulus III*, towed by the ocean-going tug, *Varius II*. The voyage started in April and ended when the pontoon entered Avonmouth Docks on 23rd June. After being re-floated the *Great Britain* was towed up the River Avon into the Floating Harbour on 5th July, and on 19th July, exactly 127 years after being launched on the same day in 1843, she was edged carefully back into the same dry dock which had been specially built for her construction. There she will be restored to something approaching her original condition by Charles Hill and Sons, under the supervision of the s.s. *Great Britain* Project Committee. The ultimate home for the ship remains uncertain at the time of going to press, because with characteristic unimaginativeness the City Fathers of Bristol have been less than enthusiastic about her return, and without the co-operation of the local authority it will be difficult to fulfil the potential of the ship as a tourist attraction. So we may yet see her removed to London or Liverpool, to the great loss of Bristol.

BIAS research projects have made some progress this year. The fruits of the Paper Mill Survey are contained in Brian Attwood's article, which is the central feature of this issue of the *Journal*. Work has begun on a detailed survey of the industrial relics of the Floating Harbour, the closure of which within the next decade is now virtually certain. Many members of BIAS have taken a keen interest in the dispute over the terms of the Bristol Corporation Bill to close the City Docks, and have been heartened by the success of the opposition in securing some significant modifications in the Bill, which will ensure that the whole extent of the Harbour will be retained as an amenity, even though the Feeder Canal will be abandoned. Whatever happens, however, a survey of the matters of industrial archaeological interest around the Harbour is already overdue, and that is now in hand. The article by Mr. Grahame Farr in these pages is a useful preliminary contribution.

On another important research project we have continued to nibble at the problem of investigating and surveying the sites of the Mendip lead industry, but as previously difficulties of finding sufficient time and of



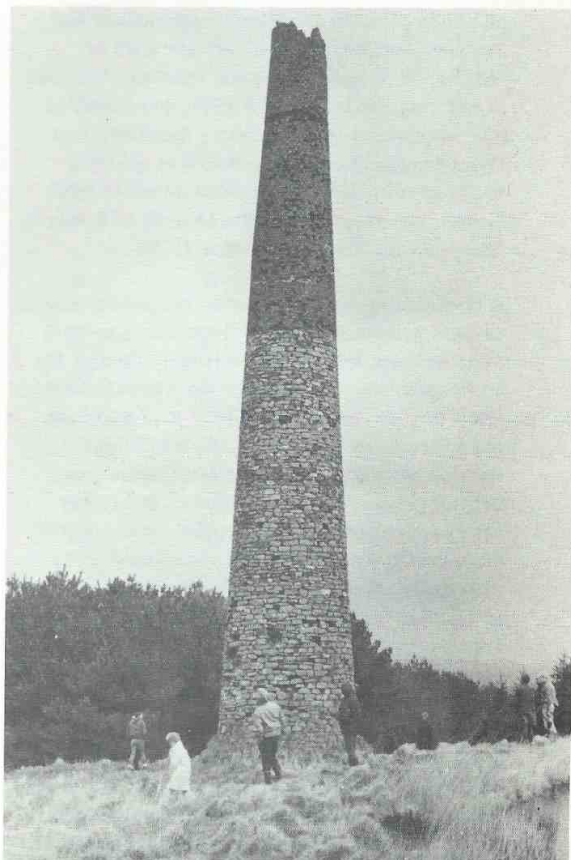
Pensford Colliery

The red-brick engine house photographed during the visit led by Mr. Parsons in May 1970



Rhino Mine

A party being shown round by John Cornwell (centre). The entrance to the mine can be seen underneath the tree. The "hut" in the foreground houses the winding gear.



Smitham Chimney

The deteriorating condition of the stone- and brick-work can be clearly seen in this view of the chimney in April 1970.

co-ordinating divergent efforts have prevented any major advance. John Cornwell continues to spend a great deal of time on Mendip (at one time an unkind rumour in the Society had it that he actually lived in a Mendip hole) and has given members the benefit of his great knowledge of the area. In May he took us to the site of "Rhino Mine" (ST 485555), where he and a few colleagues are working the only active mine on Mendip (searching for caves rather than lead) and, in the process, re-creating the mine-head paraphernalia of what must once have been a common sight on Mendip, with its spoil heap, roughly constructed shed, and winding apparatus.

We notice also that the excavations by the Somerset Schools Field Centre, carefully supervised by Mr. Frank Hawtin, have continued at the Pattinson silver process site (reported in **Industrial Archaeology**, vol. 7, no. 2, May 1970) and at Bleak House; and Mr. Burgess and his colleagues are excavating an interesting "gruffy house" site in Uley Warren. We look forward to the results of these labours, and hope to devote a considerable section of BIAS Journal 4 to this work on Mendip. It will be of interest to members that, on the application of the Mendip Preservation Society, and with the support of BIAS, the chimney at East Harptree - the last up-standing relic to the Mendip lead industry and a prominent landmark on the northern scarp of Mendip - is to be preserved and restored. The cost of restoration is estimated at £775, and money is now being raised for the project. inevitably, one local councillor has gone on record as objecting to the use of public money on an industrial relic "which is more an eyesore than a thing of beauty" (**Western Daily Press**, 17 October 1970).

A development on Mendip which has greatly concerned members of BIAS has been the appearance of barbed-wire fencing around large sections of the gruffy ground at Charterhouse and Velvet Bottom, erected by the legal owners of the land who farm the adjacent property. A cry of "Vandalism!" went up when these fences were deliberately cut, but it is necessary to pause and consider against whom the charge should be levelled when a stretch of ground to which the public has enjoyed freedom of access for many years and which has thus become de facto common land is arbitrarily enclosed, particularly when its value as farmland is by general consent negligible. The owners appear to be asserting their legal rights merely for the pleasure of asserting them, even though in the process they are closing one of the few remaining un-enclosed open spaces on Mendip. In this National Conservation Year it is especially desirable that something should be done to make more of Mendip available to the public rather than less, and any attempt to encroach on the surviving fragments of open ground should certainly be resisted. There is a good case

for pressing the Somerset County Council to acquire more access rights on Mendip, and perhaps to appoint a "Mendip Warden" to supervise the use and conservation of this outstanding amenity area.

John Cornwell, who has been so active on Mendip, has carried over his interest in subterranean industrial archaeology to the Bristol Coalfield. Together with Robin Stiles, Mat Southway, and other members of the Society, he has carried out some valuable exploratory work in this area. We had hoped that it might be possible to carry a feature in this issue of the Journal indicating the sites of all the shafts in the Kingswood area which have so far been identified, and particularly those which have been built over in recent years, but the technical difficulty of assembling all the information has proved to be too great. So we have held it over, hoping to use it on another occasion.

Joan Day continues her intensive research in the Keynsham area. In addition to the history of the brass works, which has engaged much of her attention in recent years, she has pursued items of industrial archaeological interest up the Chew valley, and enlightened members with an instructive talk about her work in this field at a Society meeting in September. The particular subject of her enquiry on that occasion was "Winford Red" ochre works, which we hope it will be possible to visit as a Society Field Party, although we have been warned regarding the properties of the all-pervading red dust!

BIAS members will be glad to hear that plans are being made to restore the Blaenavon Ironworks in Monmouthshire, the subject of a memorable visit by the Society some years ago. This was reported in the Journal of the Iron and Steel Institute in October 1970, where the interested parties mentioned included the Welsh Tourist Board, the Ministry of Public Buildings and Works, and the Iron and Steel Institute itself.

Mr. H. Green has sent us the following notes on steam boilers and steam tube ovens:

Steam Boilers

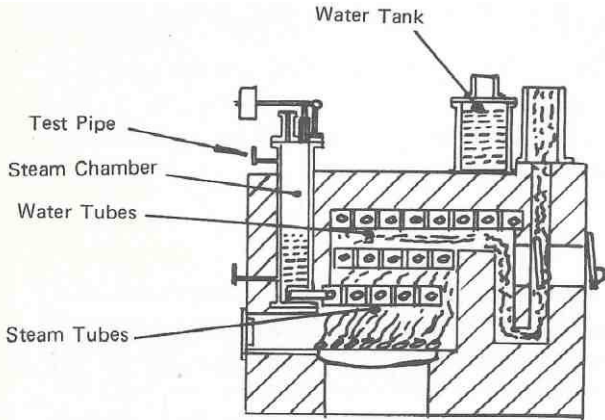
A recent hunting for information on the design of early boilers has produced the surprising result (to me) that in the period 1663 to 1873 over three thousand patents were applied for in connection with boiler development. A small group of patents that are of particular interest are those granted to a Mr. Leigh in the year 1866. The essence of Mr. Leigh's patents are a brick built fire box containing molten metal. Fuel was fed to the fire box where the heat of the molten metal caused ignition. Apparently the heat released by this ignition was sufficient (!) both to keep the metal molten and raise steam. It would be interesting to know the techniques of shutting such a boiler down, and raising steam from cold.

The Steam Tube Oven

The story of the development of the baker's oven is a fascinating one, starting perhaps in A.D. 100 when a College of Pistoires (Millers & Bakers) was founded in Rome. Then small hemi-spherical stone or clay ovens were used. Today it is common to find ovens fitted with automatic conveyors, electronic controls, and ovens of 60 ft. long are common. One of the most interesting chapters in this development story, particularly to engineers and, I hope, to industrial archaeologists, is that dealing with steam tube ovens. Many of these ovens are still in use, but their numbers are decreasing rapidly.

The oven is of particular interest because its construction meant that it was classed as a pressure vessel (boiler) under the Factories Acts, yet the detail construction meant that none of the safety devices associated with boilers could be fitted, i.e. safety valves, pressure gauges, etc. The oven was developed from Perkins' patents on tube type boilers of 1822 onwards. The first oven was installed at Neville's bakeries in London. The heating of the baking chamber was obtained from an endless tube made from "a series of pipes and couplers". Considerable trouble was experienced due apparently to the couplers leaking and the design was modified to a system of parallel independent tubes.

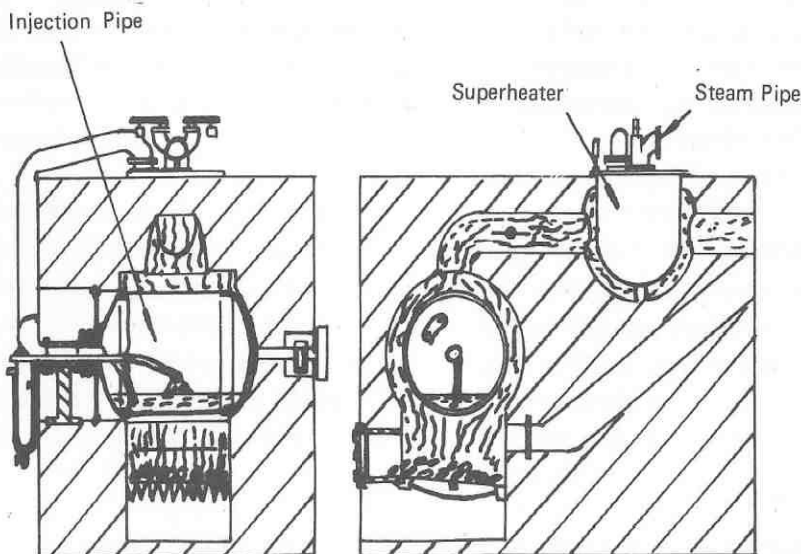
A cross section of such an oven is shown overleaf. This shows a typical 3-deck oven. Each deck or baking chamber is heated by a number of tubes usually about 1 1/4" o.d. and 3/4" i.d. The tubes were partially filled with water, and sealed at both ends. The tubes were set at a slight slope with the lower end of each tube projecting a few inches into the furnace. Bad workmanship, lack of suitable materials and methods of manufacture for high pressure tubing in the early ovens



PERKINS' INJECTION TUBE BOILER

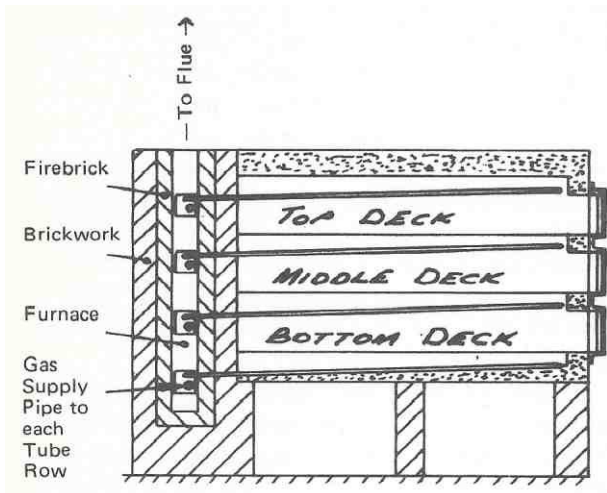
A patent which did, however, have far reaching effects was that granted to "a Mr. Jacob Perkins of Fleet Street, London", who obtained in 1822 the first patent for what was described as an "injection boiler". This patent for a boiler working at the incredible pressure (in those days) of 7,500 lbs. led to high pressure hot water heating systems, the steam tube oven, and the range of boilers which, in their development, has given us boilers we know now as flash steam boilers. This boiler, because of its small water content, has little or no risk from an explosion.

In the development of these injection boilers, there were a number of boiler designs where the shell rotated. The first boiler was introduced by a Dr. Grimaldi in 1860 and a patent was granted in that year. There were at least 3 - 4 variations of the original design. There were a number of patents on rotating boilers granted, but all had serious disadvantages, and none survived more than a very short time.



DR. GRIMALDI'S REVOLVING CYLINDRICAL INJECTION BOILER

and particularly poor maintenance, could lead to interesting but highly dangerous results.



THREE-DECK GAS-FIRED STEAM-TUBE BAKING OVEN

In the early ovens wrought iron tubes with longitudinal welded seams were used. The earliest reference to the tubing materials I have found is one dated 1890 which says that "because explosions were not unknown, Mannesmann solid drawn tubing was used". Bad maintenance of furnace brickwork would allow the tube/tubes to slide further into the furnace. This caused overheating of the tube, in extreme cases of overheating it was not unknown for not only the side of an oven to be blown out - but also a hole to be blown in the wall of the bakery!

In connection with this type of oven, "The Modern Baker" published in 1909 describes the steam tube oven as being "typical of our time". 20 years later (in 1926) the Services d'hygiene de Geneve would not consent to the erection of further steam tube ovens without permission from the Conseil d'Etat. Explosions in these ovens caused sufficient concern in the U.K. for a meeting (in 1966) of the Mechanical Engineers to be devoted to the "Reasons causing

Explosions in Steam Tube Ovens". Despite this history of explosions the oven was very popular with bakers, particularly with the small craftsman-type baker, and the performance of the modern oven is often judged by old hands with the standard of baking obtained from a steam tube oven.

A highly successful event in the Society's calendar for 1970 was the one-day Seminar arranged by Roy Day and Phil Thornton at Bath University in March. This was designed to attract contributions from regional societies in the South West and it was well attended, especially by our neighbouring societies in Gloucestershire and South Wales. The South Wales Society will act as the host for a repeat of the occasion next March. It is to be hoped that such inter-society activities will flourish, because so many industries need to be studied in a national or even an international context in order to appreciate the full significance of any particular local industrial relic. Besides this argument, it is also desirable that the study of industrial archaeology should become more co-ordinated in order to prevent wasteful or repetitive effort, and it is for this reason that BIAS has affiliated to the Council for British Archaeology Region 13, and continues to take a close interest in the national development of industrial archaeology.

Members who attended the Bath Conference on Industrial Archaeology at the end of October 1970 were impressed by the increasing consensus of opinion regarding the need for some sort of national focal point for the study of industrial archaeology. It was suggested that this should take the form of a peripatetic annual conference, meeting each year in a different part of the country to discuss some specific theme on which the locality could provide material for a Field Party, but also discussing general matters of interest to industrial archaeologists and electing a committee to pursue particular issues between conferences. It is possible that a start might be made on some such organisation in 1971, and if so BIAS members will certainly want to be involved in it.