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Since its inception *BIAS Journal* has maintained a level of stability in management to enable reliable and regular production of a high standard and, we believe, the longest unbroken record of publication in industrial archaeology. Angus Buchanan, originally the sole editor although latterly playing a smaller part, has always in the past made a contribution to the annual achievement. In the last four years *BIAS* secretary John Powell has taken a share of responsibility. Now, as *Volume 13* goes to press, both have left Bristol and we wish them every success in their new endeavours.

Angus Buchanan is taking a sabbatical year from his work at the School of Humanities and Social Sciences at the University of Bath and will be making a prolonged visit to Australia. He has taken this opportunity to retire from his editorial work on the *Journal* and his place has been taken by Joe Bettey, Senior Lecturer in Local History in the Department of Extra-Mural Studies at the University of Bristol. John Powell, however, wishes to continue his involvement with the *Journal* from Coalbrookdale where he is combining professional qualifications with his experience in industrial archaeology by his librarianship of the Ironbridge Gorge Museum Trust. He will be responsible for expanding the collections and extending the role of the library.

In this move, he follows the lead of earlier *BIAS* members such as John Robinson, now at the Science Museum, responsible for administration of the Fund for the Preservation of Scientific and Technological Material and Martin Watts, former member of *BIAS Journal* editorial executive, who is now curator of Worsborough Mill Museum in South Yorkshire. Both have successfully used their interest and experience gained with *BIAS* to become professionally involved in industrial archaeology. JMD

Clevedon Pier

Peter Mason, executive director of consulting engineers Portland Associates, has written recently to the Association for Industrial Archaeology referring to the Public Enquiry, held in Clevedon, which considered the Woodspring D C proposals to demolish the pier. He writes:-

By a survey of the pier and with the help of divers, an examination of the wrought-iron screw piles was carried out. We managed to produce enough evidence to convince the inspector, Mr John Eyre, R IBA, ARICS, MRTPI, that the pier was not in imminent danger of collapse and, with sufficient money, could be rehabilitated. He recommended to the Minister that the application be refused and the Minister accordingly upheld this recommendation. The Pier Preservation Trust is now in the course of preparing plans to raise finance for urgent repair work and the ultimate rehabilitation of this rather graceful example of a Victorian pier.

Local progress in conservation

The proposals for converting the near-derelict hydraulic engine house at Junction Lock, reported in these columns and featured on our covers last year, reached fruition during 1980 and The Pumphouse dockside pub is now open to the public as planned. A source of contention in Bath has been resolved with work now well under way on the restoration of Prior Park Cottages, the eighteenth century workers' housing built for Ralph Allen's quarrymen. The first phase of the scheme is scheduled for completion in March 1981 and the final project should be completed in the following year. Decisions have also been made at last on the future of Bath's Green Park Station. The car park, its only recent use, has now been closed in preparation for the conversion of the complex to a store for Sainsburys thus bringing the years of neglect to a halt.

Work at a voluntary level, mainly by *BIAS* members, has made a start at Saltford Brass Mill in preventing further deterioration in the building and its unique annealing furnace. A fund has been set up by the Avon Industrial Buildings Trust, now legally established as a charitable body, to finance an extensive scheme to ensure the future of this site. The first phase of rescue work which is estimated to need about £10,000 has already received some promises of financial help from industry and public bodies, but needs cash in the bank to get off the ground. Treasurer of the trust, Robin Lewis of 11 The Grove, Winscombe, Avon will be pleased to receive donations or enquiries for trust membership at an annual subscription of £3.00.

The Brunel Engineering Centre Trust, formed for the purpose of saving old Temple Meads, and finding appropriate uses for the building in the future, has established The Friends of Brunel's Temple Meads. Members will be kept informed of developments in a quarterly newsletter for a fee of £3.00 per annum. Applications to: Graham Harrison, Becketts Place, Marksbury, Bath BA2 9HP.

Repairs to Ashton Windmill, Chapel Allerton

Geoff Wallis, of Dorothea Restoration Engineers writes:-

A programme of repairs has been completed recently at Ashton Mill, the only complete windmill surviving in Somerset.

The mill worked as late as 1927, powered on occasions by a portable steam engine. It then fell into disuse until 1958 when the late C C Clarke of Stone Allerton had repairs carried out to a specification by Rex Wailes. In 1966 the mill was passed into the control of Bristol City Museums. Although the mill was complete when first repaired, it remained so for less than fifteen years. The laminated douglas fir stocks (to which the four sails were secured)

rotted seriously and had to be removed for reasons of safety, the sails being put into storage. Following his survey of Somerset windmills and their remains, (*BIAS Journal 6, 1973*), Martin Watts, proposed a scheme of repairs. In 1978 he became consultant for the work and drew up a detailed specification on behalf of the City Museum. Dorothea Restoration Engineers Ltd. were appointed by the City Council to undertake repairs and these were completed by July of the following year. Contributions to the cost of the work were made by Sedgemoor D C and The Area Museum Service for the South West as well as Bristol City Museum and Art Gallery.

Repairs were carried out both to the structure and mill-work. Extensive repointing of the interior surface of the tower wall was necessary after removal of the remains of defective plaster. After the renewal of a rotted lintel, and making good the meal floor, the inside and outside of the tower were painted white to appear as they would have done when in use, as evidenced by early photographs. Several cills, joists and floorboards were replaced where seriously decayed, with seasoned oak replacements closely matching the originals. The stones-floor access ladder was disassembled and new stiles fitted, there still being a few decades of 'life' in the original treads. The cap is supported by a 'live' ring of ten iron rollers and centered by a further seven rollers supported by timber blocks on the cap frame. Two of these blocks had decayed and were replaced with seasoned oak dressed by adze to match the originals. These were secured in place with the original bolts, and all rollers freed and lubricated. Minor repairs were carried out on the winding gear and the track in which it runs. The gear train was assembled, cleaned and lubricated. The internal machinery of the mill is substantially complete and in potentially workable order. All ironwork was brushed down and protected, and a new chain fitted to the sack-hoist. A long split at the tail end of the oak windshaft was strapped with a closely fitting forged iron band as a precautionary measure. Finally, after cleaning down and removal of two barrow-loads of birds' nesting material from the cap's tail box, all internal timberwork was treated with preservative. Concurrent with the site work, new stocks were under construction in Bristol. For reasons of durability steel stocks were specified. Considerable care was necessary during construction to ensure that the stocks remained free from distortion and when complete, had to be indistinguishable from their timber predecessors. Both stocks were painted internally during construction and zinc sprayed externally when complete.

In June 1979 the two new stocks were delivered to the mill, and the sail frames taken from storage. To locate the 30 ft long stocks in the 'poll' casting of the windshaft it was found necessary to dig a hole three feet deep in front of the mill. This enabled the stocks to be slid under and into the canister where they were then wedged up in position. The sails were clamped and bolted to each stock, the unbalanced assembly of one and three sails being turned with considerable care to allow sails number two and four to be fitted. Finally lightening conductors were refixed to the sails, and both sails and stocks coated with traditional lead-based black paint. The mill is once again complete, and appears much as it would have done in the last century. The winding gear, used to turn the cap to windward, shows signs of past damage due to overstraining and the cap is still

difficult to turn on its rollers. Apart from this, the structure is now in a condition in which, after minor work, sail could be set and flour milled.

Willsbridge Mill and the 'dramway'

Proposals are under consideration for the Willsbridge Mill site to be placed under control of the Avon Wildlife Trust as a nature conservation centre. The present building is a former grist mill which was still producing cattle feed until the 1960s but, to industrial archaeologists, the site is of greater interest as that of the early eighteenth-century ironworks established by the Pearsall family as a water-powered rolling mill. A descendant Thomas Pearsall, patented a method of using hoop iron for roof construction in 1811, under Patent Number 3503. Disaster followed when one of his roofs collapsed after being built in London docks and within the next few years the Willsbridge premises were being advertised for sale. The works then contained rolling and slitting mills driven by two overshot 18 ft dia water-wheels, furnaces and a steel house. A 35 hp engine was in place for use, when water was low in the summer, but efforts were made to conserve supplies by having an extensive millpond.

The site now appears to contain little evidence of its past in the iron industry apart from the large millpond, the dam of which was breached in the floods of July 1968. Although now depleted, a large expanse of water still remains in the pond which makes the site ideally suited to that of a nature reserve. Part of the property is also traversed by a section of the long-disused Avon and Gloucestershire Railway (the 'dramway' to the locals) at its most interesting part and, as such, is of great interest to BIAS members. It is understood that a representative of the society will be welcome to keep a watching brief over any possible developments which affect this important feature of horse-drawn rail-transport history. Peter Stuckey has agreed to undertake this 'responsibility on our behalf.

At the opposite end of the line (after joining the route of the Bristol and Gloucestershire Railway at Shortwood) some remains of track were revealed recently at Ram Hill (ST 678803) in the form of a double line of stone sleepers with some chairs in situ. This section was on part of the most distant of three branches of the original Bristol and Gloucestershire route and at a site that was about to be used for building. Hurried measurements by Robin Stiles and photographs by John Cornwell were taken before the remains disappeared but both hope that it will be possible to carry out further work in the vicinity.

Tramroad register

BIAS member John van Laun is collating information on tramroad remains throughout the country on behalf of the Railway and Canal Historical Society. *Tramroad* is to be taken in its widest sense but excluding mineral or colliery branches from a mainline system. Initially, the requirement is for details of hardware relics which have been discovered, such as types of rails, chairs, stone blocks, methods of fixing etc., in their almost infinite variety, with their locations and tramroads. These details deserve to be recorded before the evidence disappears completely with the existing scale of pilfering of such relics for private

collections. The area covered by our society can produce a range of examples from crude bar rail of the 1790s to far more sophisticated developments. The scheme deserves the support of BIAS members.

Bristol & Exeter reminders

Demolition work on British Rail property to the west of Bath Road Bridge went /arge/y unnoticed in the earl y part of the year; but a large stone building which disappeared was an original Bristol & Exeter Railway goods shed. BIAS member C R Clinker writes:-

Pylle Hill itself, when cut away and removed, formed the level space on which, inter alia, the goods depot was built. The building was brought into use on 1 April 1855, replacing the temporary (probably wooden) separate 'inwards' and 'outwards' shed on either side of the Bath Road overbridge. The temporary sheds dated from 1 May 1850: from the opening of the first section of the B & E between Bristol and Bridgwater on 14 June 1841 goods traffic had been dealt with at the Great Western depot. The B & E was leased to and worked by the GW for five years from that date. Thereafter the B & E was completely independent until 1 August 1876 when it amalgamated with the GW. In addition to the goods shed on the Pylle Hill site, there was a special 'excursion platform' for the use of what the railway companies regarded as 'the lower classes' in their policy of segregation. There was a similar platform on the down side at Bedminster and also, oddly enough, at Clevedon: this latter was abolished on 8 May 1879. The B & E General Offices (to use the official name), the Company's headquarters at Temple Meads approach, were started building in March 1852 and completed and occupied in October 1854. The building has some unusual features in its design and had a very fine directors' boardroom. I spent some of my early years working in these offices and so know the building well. It is, as far as I know, the only remaining B & E structure left. The footbridge was a later GW addition.

The B & E locomotive department buildings were erected on the site now occupied by the diesel locomotive depot at the west end of Temple Meads Station. There were two groups of buildings side by side - the locomotive workshops at which some of the company's engines were built and all were repaired, and the running sheds housing the engines in use. The latter had a large clock outside which I remember well. The two buildings were rebuilt in 1934 into one modernised GW steam locomotive depot known as 'Bath Road Sheds' with altered and improved track layout. The very last B & E remains disappeared in 1961-2 when the present diesel locomotive depot took shape. The history of Temple Meads Station and its surroundings is both interesting and complicated: I have much original material and notes together with personal memories going back to around 1920. I hope to use this and other documentary material to finish the compilation of a chronology of the railways of Bristol and surrounding area which I started in 1936. It already contains information which I know is not to be found elsewhere after destruction of official records which I had fortunately been able to work through and extract the historical 'meat'.

Bristol's airport and aircraft

31 May 1980 was the fiftieth anniversary of the opening of Bristol's first municipal airport at Whitchurch, on the southern outskirts of the city. This was to have been commemorated by means of an air display at Lulsgate, which became the city's airport from 1957 onwards, the Whitchurch site being somewhat restricted and surrounding areas desirable for housing expansion. The Lulsgate air display was then abandoned in favour of one at Filton, and this was in turn abandoned in favour of a display at Greenham Common in Berkshire, hence all local significance was lost. The only local reminders seem to have been a rather nice postcard produced by Bristol City Museum and an interesting article entitled 'Bristol Airport' in the June issue of *Bristol and West Country Illustrated*.

29 July 1920 was the date when the Bristol Aeroplane Company took over Cosmos Engineering and established engine-manufacturing workshops in new premises north of Filton. The Jupiter engine, used in the *Bristol Bulldog*, was built and tested within a year, to be followed later by such famous names as the *Lucifer*, *Mercury*, *Pegasus*, etc. The history of the works was recorded in an article entitled 'Rolls-Royce Bristol 1920-1980' in *Flight International* magazine dated 27 July 1980.

The importance of the aircraft industry to the City of Bristol has resulted in a fine display of restored aero-engines (and the *Concorde* flight-deck mock-up formerly used at Filton) on the first floor of Bristol's Industrial Museum.

Decline of Fullers Earth industry

Laporte Industries Limited closed the region's last surviving fullers earth works at Combe Hay (ST 729612) early in 1980, although the manufacturing plant at the site is to be retained intact against possible future use. An unsuccessful attempt was made to arrange a site visit for a small number of BIAS visitors before closure. At about the same time, the fullers earth works at Midford (*BIAS Journal 11*) was completely obliterated, and the site is now occupied by a large water storage reservoir. There is now a fine view from the road of the previously hidden SDJR Tucking Mill Viaduct, but no visible evidence at all that a sizeable works existed there for over ninety years.

A botanical view of industrial archaeology

Dave Green, a member of the autumn extramural IA course at Radstock, sees the study of industrial archaeology as a means of discovering particular plant species which he is systematically recording throughout the area.

Man's shaping of the landscape over many generations has had a direct impact on its plant life. With the steady development of Britain's road network, the transportation of goods became a significant method of seed dispersal for some plants which had hitherto occurred only in limited areas of the country. Some seed capsules, like the burrs of the burdock family, attach themselves readily to clothing and animal hair, and can thus be carried over considerable distances. For hundreds of years, many foreign cornfield weeds found their way here with the regular imports of

grain. Such plants were once a fairly common part of the English scene, but since the Clean Seed Act of the 1920s and the more rigorous screening of imported grain, these plants have dwindled in number, and a few, like the corn cockle are near to extinction here. The making and repairing of a road attracts those plants which prefer disturbed ground, and these are the first to colonise bare soil-dock, goosefoot, fathen, mayweed, and so on. Many ancient greenways now survive as havens for wildlife because they are relatively undisturbed. Their old hedges often contain an interesting variety of trees and shrubs, such as spindle, buckthorn, and field maple. In **agriculture** the systematic increase in arable farming led to a decrease in the numbers of downland plants. The cowslip and the green-winged orchid are classic examples of once-common plants which have suffered a decline because of this change in habitat. The drainage of wet land and the grubbing of small copses and hedges also eradicated many plants which favoured these types of environment. So, instead of last year's shady hedge with its bluebell, dogrose, and primrose, this year will be seen a golden cornfield dotted with poppies and scarlet pimpernel.

The spoil from the old bellpit mines left small patches of a sterile, slightly acid medium on which calcifugious plants gradually established themselves. This process is repeated on the larger, more recent spoil-heaps, where silver birch, sheep's sorrel, and other plants eventually take over an originally bare lifeless slope. Such places also become refuges for those 'weeds' which are elsewhere threatened by ploughing and herbiciding. The lead-mining areas of Mendip attract two lead-loving plants, the Alpine penny-cress and the spring sandwort. The exposure of bare rock faces in **quarries** gives rise to small patches of flora, such as stone crops, which would not otherwise have appeared. The building of drystone walls also has this effect, and they provide an ideal environment for many mosses, lichens, ferns and small flowering plants. The Avon gorge contains several plants which are rare elsewhere, including members of the whitebeam family and some orchids. The Bristol rock cress, for instance, has no other site in Britain. When trees grow up and shade the quarry sides, many of the little rock-loving plants disappear. The old disused quarries which tend to fill with water can become important reserves for fish, birds, amphibia, and a variety of aquatic plants.

With the building of **canals** came a greater stock of almost still water favoured by such plants as the water-lily, iris, and hemlock. When the Canadian pondweed was introduced in England, it spread with lightning speed, choking whole stretches of canal and becoming a considerable nuisance to water traffic. Eventually it retreated as quickly and mysteriously as it came. As the canals fell into disuse and became silted up, the mud-loving plants - brooklime, watercress and so on - came to dominate the scene. The **railways** have played an important role in the distribution of invasive species of plants. A well-documented example is the Oxford rag-wort, a native of the slopes of Mount Vesuvius, which was brought to the Oxford Botanical Gardens in the 1830s and which began to spread along nearby railway lines. Since those days it established itself in many new sites and is now quite common throughout England. It often happens that unusual plants will appear near railway tracks far away from their natural homes,

because the seed has been carried by passing trains. Abandoned lines act as mini-reserves for many forms of wild-life, which are relatively free from disturbance. Another interesting feature of derelict stations are the old-fashioned garden plants, such as the everlasting pea at Midsomer Norton, and sometimes various mints and roses which have continued to grow wild.

A bellfoundry in Keynsham

A few of the members attending the early 1964 Folk House course in industrial archaeology, from which BIAS eventual grew, had been involved previously in excavations at the site of Keynsham Abbey organised by the Folk House Archaeological Club. Work on the remains of this medieval abbey has continued over the years although contact with BIAS was lost as separate interests became more specialised. In August 1980 the monastic site dig quite suddenly became relevant to industrial archaeology when the partial remains of a furnace were uncovered in a previously untouched corner of the abbey chapter house. It was constructed on and through the medieval tiled floor, with abbey tiles used in the furnace hearth, and scraps of metal and slag present. Barbara Lowe, assistant to Ted Mason in charge of the site called to BIAS for help and, after a brief inspection, it seemed worth persuading Professor R F Tylecote, archaeo-metallurgist from the Institute of Archaeology to visit the abbey.

The remains were of a reverberatory furnace, up to the level of the 5 ft long oval hearth, with a sloping firebox and ashpit in good condition but the roof (which probably had been vaulted and semi-circular in shape) was completely missing. Professor Tylecote's analysis of the metal showed it to be a bronze, an alloy of copper and tin with a tin content of 25%, a composition which would be too brittle for any product other than bells. Clearly, he writes, the furnace has been used for bell casting. From its stratification and position it is post-dissolution (after 1539) but could have been in use up to 1750 from the type of construction. There is no known documentary evidence to explain the existence of a bell foundry of this sophistication on the site. Bells were replaced in the parish church during the 1600s but the furnace is of a standard which indicates an extensive industrial enterprise. The Bilbie family of Chew Stoke and the Purdues of Bristol, both long-lasting bell-founding families relevant to the period do not appear to have had any Keynsham connections, but research is continuing.

SCI Centenary

The Society of Chemical Industry celebrates its centenary in the coming year having been formed in 1881. The Bristol Section in conjunction with BIAS will be mounting a display in the foyer of Bristol Central Reference Library between 23 May and 6 June to mark the occasion. *BIAS Journal 13* has taken the opportunity to ask Raymond Holland, secretary of the Bristol Section SCI to write, over the page, about the chemical industry in which he is involved, the tar distillery at Crew's Hole.

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