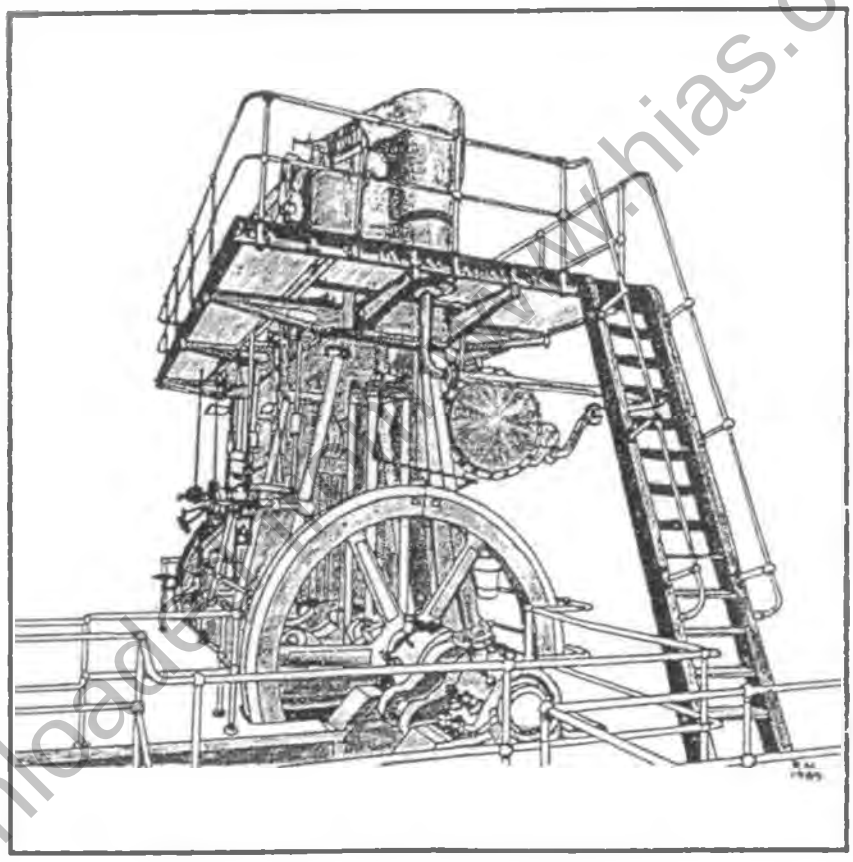
ISSN 0967-3474

Southampton University Industrial Archaeology Group Journal



Downloaded from www.hias.org.uk

No. 2

November 1993

Contents

Contributors 1

Editorial and Acknowledgements 2

Twyford Pumping Station *by Edwin Course* 3

Southampton & Salisbury Canal - The Lost Cutting *by Jon Sims* 8

The Circus Comes to Town *by Bill White* 16

Cast or Wrought? *by James Paffett* 20

Gunners Bank *by Michael Tighe* 24

Canal Restoration in Scotland *by Gerald Davies* 29

SUIAG Publications 32

The Contributors

Edwin Course

Edwin Course taught at the University of Southampton from 1956 to 1988. His research and writings have been mainly in the fields of transport history and industrial archaeology. He has been involved with the Twyford Pumping Station since 1973 and has been Chairman of the Twyford Waterworks Trust since its formation in 1985.

Jon Sims

Jon Sims was born within hailing distance of the Peak Forest Canal without being aware of the fact. He then lived just down the road from the Cromford & High Peak Railway without realising it. His teens were spent surrounded by the Birmingham Canal Navigations, a fact which he only really appreciated shortly before moving to Southampton in 1972 to take up a job at the Ordnance Survey. His introduction to the waterways was through Sea Scouts, his interest in I.A. starting with steam pumping stations which he visited with his father, a waterworks engineer. Since hiring his first boat in 1977, he has become fully immersed in both subjects. He writes regularly for *Waterways World* and *Canal & Riverboat* on photography, industrial archaeology and waterways in general. He is a member of the IWA, the Railway & Canal Historical Society and several canal societies. His great love is the Basingstoke Canal, especially certain bits of Lock 19.

Bill White

Bill White is a Sotonian, living and working in the city in the construction industry, starting as an apprentice bricklayer at the University. He is a founder member of SUIAG and the city's archaeological society, and been involved in many of the historical projects in the area. His many interests include collecting records, jazz, railways and researching the history of Southampton's cinemas.

James Paffett

James Paffett's career as an architect for the Royal Navy was documented in Journal No 1. After his period as Professor of Naval Architecture at the Royal Naval College, he later served as head of the civil ship research establishment at Feltham. Now retired from Government Service, he is a Vice-President of the Royal National Lifeboat Institution and Honorary Vice-President of the Royal Institution of Naval Architects.

Michael Tighe

Michael Tighe is a retired banker and one of the "founder members" of SUIAG. He edited the *Gazetteer of Hampshire Breweries* [Hants Field Club / SUIAG 1971] and is at present researching the early textile industries of Wessex.

Gerald Davies

Gerald Davies' career was in electronics and aerospace systems, which has little in common with his interest in canals and railways which goes back to his childhood days. He became a member of SUIAG about ten years ago which has broadened his knowledge of IA subjects. He cruised on most of the English inland waterways in the 1960s and early 70s, and more recently spent a week on the River Barrow and Grand Canal in Ireland.

Downloaded from www.hias.org.uk

Southampton University Industrial Archaeology Group Journal

Editorial and Acknowledgements

This is the 1993 edition of the SUIAG *Journal*. We hope that we now have worked out production methods which will enable the *Journal* to be produced within the budget available, and that in 1994 it will be possible to restore the November publication date. The policy of publishing articles about industrial archaeology, the history of technology and economic history in Hampshire or, alternatively, any pieces by members of SUIAG, remains unchanged. A length of 5000 words is welcome, but anything between 1000 and 7000 words is acceptable (a *Guide to Authors* is available). Shorter pieces may be more suitable for *Focus*, and longer works may be published as monographs.

We are particularly grateful to Angela Smith who set and designed the 1993 *Journal* and to John Christmas and Southern Water who undertook the printing. We are also most grateful to all our contributors. More specific acknowledgements appear with the pieces to which they apply.

For drawings and photographs we are grateful to the following: Edwin Course (Figs 16, 18, 19); Ron Mapp (Cover drawing, Figs 1 - 4); Ordnance Survey (Figs 5 - 10); James Paffett (Fig 17); Angela Smith (Fig 24); Nigel Smith (Fig 25); Strathkelvin District Library (Fig 26); Michael Tighe (Figs 20 - 23); Bill White (Figs 11 - 15).

Edwin Course
November 1993

Published by Southampton University
Industrial Archaeology Group

©Copyright 1993 individual authors and
Southampton University Industrial Archaeology Group
All rights reserved

Editor: Dr Edwin Course

ISSN 0967-3474

Produced by Angela J. Smith

Reproduced by Southern Water plc

Downloaded from www.hias.org.uk

Twyford Waterworks

Southampton University Industrial Archaeology Group has, for many years, been involved in recording and publishing, and also in restoration projects. Recording has been undertaken by temporary, ad hoc, groups but restoration projects have been hived off to semi-autonomous, satellite organisations. One such is the Twyford Waterworks Trust, which began with a steering committee in 1973 and became a registered company and charity in 1985.

1898-1921

The story begins in 1876 when the South Hants Water Company was authorised by Act of Parliament to extract and supply water in an area to the north and west of Southampton. It opened its first pumping station at Timsbury, near Romsey, in 1878. The demand for water increased, not only by virtue of extension of the mains network, but also by the increasing use of baths and flush toilets.

A second pumping station was authorised in 1894, with authority to extract up to 2,500,000 gallons a day from the chalk aquifer. Under the direction of Baldwin Latham, the company's consulting engineer, numerous trial borings were made before the final selection of the site near Twyford. Contracts were let in 1898 for the engine and pumps and also, in view of the hardness of the water, for water softening plant. Instead of the system of precipitation in tanks, as used at Timsbury, a system of filters which permitted the continuous flow of the water was chosen. This was the Haines system, patented by the manager of Southampton Corporation's Otterbourne Works. The main engine was a horizontal three cylinder compound owing much to marine practice, and constructed by Day, Summers, shipbuilders of Southampton. They employed Mr. J. Stone, who had served his time with them before going to sea on the Royal Mail Lines' *Magdalena*. Having recently married, when the erection of the engine was completed he was pleased to accept the post of the first superintendent at Twyford. A good house went with the job and he remained in post until 1933. Being something of a martinet, he has become the source of many anecdotes.

Pumping began in 1900, but the full operation of the softening plant was delayed until 1903. The lime, to be mixed with the raw water before the filtering process, was produced in two lime kilns. These used chalk, dug from a pit on the site, and fuel - coal and coke - brought by horse and cart from the railway siding at Shawford. Demand for water continued to increase and in 1905 a contract was let for a new engine to be installed in a new engine house.

This was to be a vertical triple expansion engine, built by Richardson, Westgarth of Hartlepool with pumps by Easton and Anderson of London and Erith. The original Lancashire boiler was transferred to Timsbury and a pair of Babcock and Wilcox water tube boilers were installed. The rising demand led to the decision to dismantle the Day, Summers engine of 1900 and to replace it with a second vertical triple expansion to be built and erected by Hathorn, Davey of Leeds. Fitters from Leeds spent some time at Twyford, particularly on 'fine tuning' the Corless valve gear. The new engine was finally accepted in 1914.

During the First World War, a large number of troops were in the area, and the

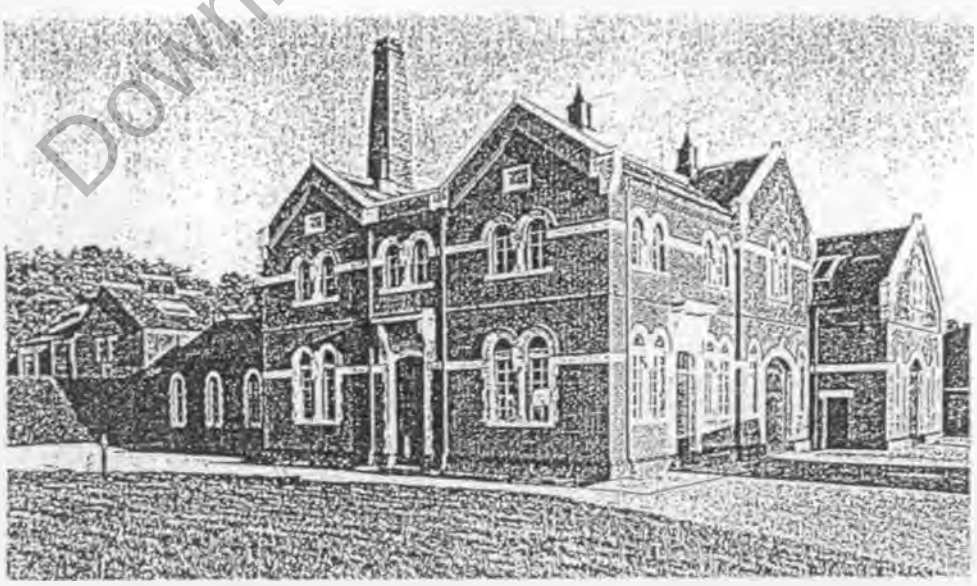


Figure 1
Twyford Waterworks
Main engine houses

Downloaded from www.hias.org.uk

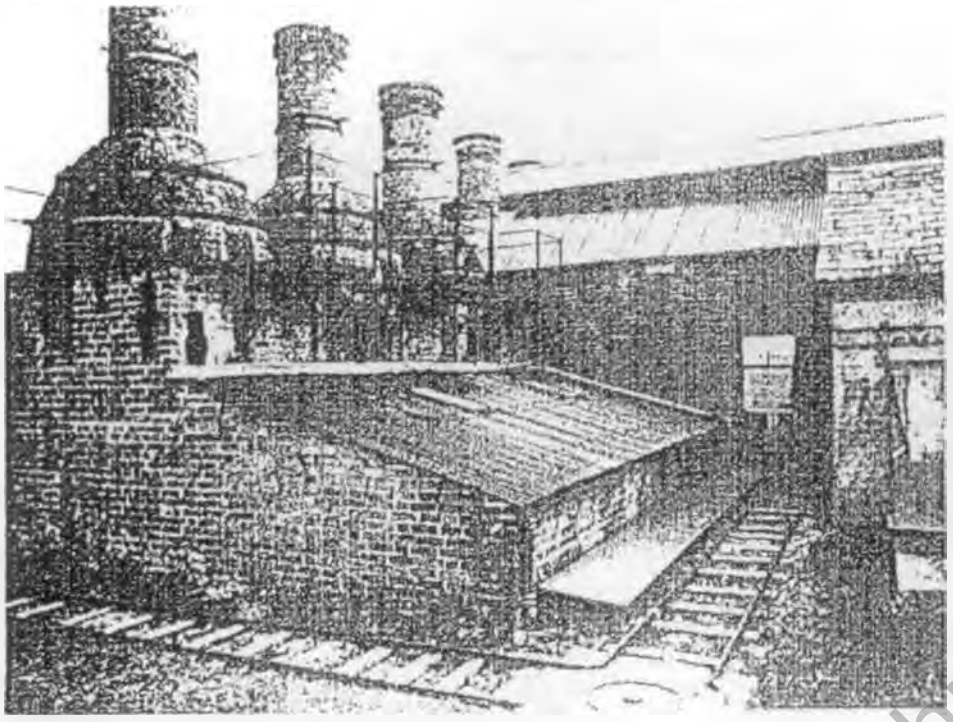


Figure 2
Twyford Waterworks
Limekilns and railway

pumping capacity of Twyford was increased by the installation of a third Babcock and Wilcox boiler in 1916. On the other hand, ostensibly because of the labour shortage, softening was discontinued in 1917 and not resumed until 1922. Mr Stone confessed that for a week in the June of 1918, output had exceeded the statutory 2,500,000 gallons a day and, in 1920, the statutory limit was increased to 3,500,000 gallons.

1922-1945

A significant development during the First World War had been the linking of the South Hants' and the Southampton Corporation's systems of mains so that in the event of any of the pumping stations being damaged by enemy action, one undertaking could assist the other. In the event there were no air raids on the area. Predictably, in 1921, Southampton Corporation absorbed the South Hants company. The municipalisation of statutory companies had been frequently applied to street tramways but was less common for water undertakings.

The first development under the new ownership was the deepening of the wells from 126 feet below the engine house floor to 166 feet, increasing the pumping capacity to the new statutory limit of 3,500,000 a day. As the softening plant could only cope with a proportion of the raw water, additional filters and three new lime kilns were brought into use in 1930. The odd thing about the new lime kilns was that they were of identical design to the original kilns of 1903 and, almost incredibly out of date. Further extension of the wells, now fed by adits, increased the capacity of Twyford to 5,000,000 gallons a day.

It proved necessary to provide more pumps and the choice lay between diesels, steam turbines and electric pumps. Electricity was eliminated because the electricity company wanted too much to bring in the supply. Steam was a possibility, and was indeed chosen for Otterbourne. However, Otterbourne's coal came via a private siding on the main line railway, whereas that for Twyford was brought by lorry from Shawford Station.

It was the cost of coal that determined the choice of diesels for Twyford. Three engines were supplied by Ruston and Hornsby of Lincoln, with pumps by Gwynnes, all brought into use in 1935. They were intended to supplement the two steam engines, but examination of the pumping records shows that, without any formal change of policy, the base load was moved from the steam pumps to the diesels. (Among other things, diesels did not require stoking).

In 1911 lighting by oil lamps had given place to a gas, consisting of 2% petrol and 98% air. In 1934 two electric generating sets, providing Direct Current for lighting and also power in the workshops, were erected in the boiler house. One had a diesel engine and the other was steam. In practice the diesel was normally used, as the high speed steam engine was "a steam guzzler".

Softening ceased at the outbreak of war in 1939, ostensibly because of the difficulty of blacking out the lime kilns, and was not resumed until 1946. However, the lime kilns

Downloaded from www.hias.org.uk

were not reinstated, as with the development of road transport, it proved possible to bring lorry loads of lime direct from Derbyshire.

1946 - 1974

After the end of the war it was decided to dismantle the Richardson, Westgarth engine, located in the 1905 engine house, and install three new electric pumps. These, with the diesel engines and the Hathorn, Davey engine as a standby, would meet all demands for water. A mains electricity supply was provided with a very austere brick building to house the necessary transformer and the mercury arc rectifier. (The new pumps used Direct Current). With lime coming from Derbyshire, somewhat inexplicably the decision to demolish the lime kilns to provide hard core was not implemented.

In 1953, to reduce the need for using the main boilers, a small boiler was purchased to provide steam for sterilising the filter cloths of the sterilising plant. The steam engine was maintained in good order and, as late as 1967, fifty new fire bars were purchased for the No.1 boiler. Water softening ceased in 1969 and the small boiler finished up on a canal boat.

Extra demand for water was met by the introduction, by 1964, of submersible electric pumps in boreholes. Subsequently the base load was pumped electrically, with the diesels on standby, although the Hathorn, Davey was maintained in working order. By 1972 it had been decided to demolish the pumping stations at Otterbourne, Timsbury and Twyford and to replace them with submersible pumps in the wells, all controlled from an operations centre at Otterbourne.

On 21 May 1973 the present writer wrote to Mr W.G.H. Tripp, the Engineer of the Southampton Corporation Waterworks undertaking, expressing the interest of the Southampton University Industrial Archæology Group in the preservation of Twyford Waterworks. Needless to say, we would have preferred Otterbourne, which retained beam engines, turbines and triple expansion engines, but we felt that preservation on that scale was beyond our resources.

Both the Southampton Waterworks and the University I.A. Group were aware of the possibility of statutory protection for the works and, on 5 July 1973, Jonathan Coad, an Inspector for the Department of the Environment, visited Twyford. His recommendation that the pumping station, the associated water softening plant and the five lime kilns should be given the status of a Scheduled Ancient Monument was subsequently confirmed, and Twyford Waterworks was saved. On 5 September 1973 a steering committee met with Councillor David Pumfrett, Chairman of the Hampshire County Council Recreation Committee, as Chairman, the present writer as Vice Chairman and Mr. John Horne as Secretary.

1974 - 1993

On 1 April 1974, the Southampton Corporation Waterworks undertaking, including Twyford Waterworks, passed to the Southern Water Authority and, in 1975, the steering committee was joined by their representative, Mr. Ericson. At the time it seemed that the best hope for the future of Twyford was for it to be taken over by the Hampshire County Museums Service, rather than the formation of a separate trust.

While negotiations proceeded, essential maintenance was undertaken by Southern Water, Hampshire County Council (in particular Cyril Hathaway) and the Community Industries Organisation (organised by John Horne). Unfortunately, during this period, some essential items went missing from the site, including a hydraulic engine, the equipment from the filter house and some of the boiler fittings. Finally, on 1 March 1979, the County Recreation Committee received a very full report from the Director of Museums, setting out plans for Twyford. While they were favourably impressed, the Committee felt that other projects should take precedence over Twyford and so, after a four year delay, it became necessary to revive the plans to form a Twyford Waterworks Trust.

On 9 May 1980 a meeting was held at the Castle in Winchester at which it became clear that the Hampshire County Council would be prepared to act as 'midwife' for the setting up of a Trust. After some negotiation, detailed policy was formulated at a meeting in the Chairman's Room on 29 September 1981 with Sir Lynton White (Chairman, H.C.C.), Arthur Smyth (recently retired Chairman of S.W.A.), Edward Mason (Assistant County Secretary), Phil Turner (Assistant County Planning Officer) and the present writer (Southampton University). Much of the work was to be undertaken, on a semi-voluntary basis, by officers of the County Council, with the result that it was carried out very thoroughly, but not rapidly.

In the formative stages, the present writer became Chairman, Bob Spencer was Administrator, Pam Moore was Secretary and Jack Sara of Southampton University became Chief Engineer. In 1984 Merfyn Hewins joined the steering committee, representing

Downloaded from www.hias.org.uk

Southern Water, and Bob Spencer was replaced by Ron Mapp, formerly of Tube Investments. Formal establishment as a trust with charitable status and a registered company was achieved in 1985, twelve years after the first informal meeting. During this period, essential maintenance had continued, and the only setback was the removal of some significant items from the site.

On 27 October, the first volunteer working party began work on the site, and work has continued on alternate Sundays and most Wednesdays ever since. The first Open Day was held on 20 April 1986 and attracted about 500 members of the public. Twyford has always depended on a mix of volunteer and professional labour and an example of the latter was the removal of asbestos from the steam plant. In anticipation of the leasing of the works to the Trust, Southern Water continued with the full restoration of the buildings and on 5 January 1987 John Reynolds, the Trust's Clerk of Works, reported that £149,000 had been spent.

It became increasingly apparent that the rate of progress of the restoration work was influenced by delays in the granting of the lease. In particular, this applied to the application to the PRISM fund for the restoration of steam power, which could not be made until after the lease was completed.

However, this did not prevent progress in a number of directions with financial support from other sources. For instance, in 1988 Twyford received £1500 from Hampshire County Council, £1000 from Southern Water and £250 from Messrs Braziers for a specific project. With regard to organisation, a pattern was established with the Board of Management meeting twice a year, supported by three sub-committees - Engineering, Buildings & Site and Finance & General Purposes. In 1989 Jack Sara, who had contributed so much to the restoration of the machinery, retired, and has been replaced by "Bunny" Burrell and Tim Moth.

Work completed on the site included the restoration of all the diesel engines, with the exception of one used for display purposes, and the running of the Hathorn, Davey steam engine on compressed air. The railway had suffered from the removal of rails and of the hydraulic engine which provided power for the rope-worked inclined plane. It was relaid with rails donated by the Ministry of Defence from a disused firing range and an exact replacement for the original hydraulic engine was obtained on permanent loan from Crofton Pumping Station.

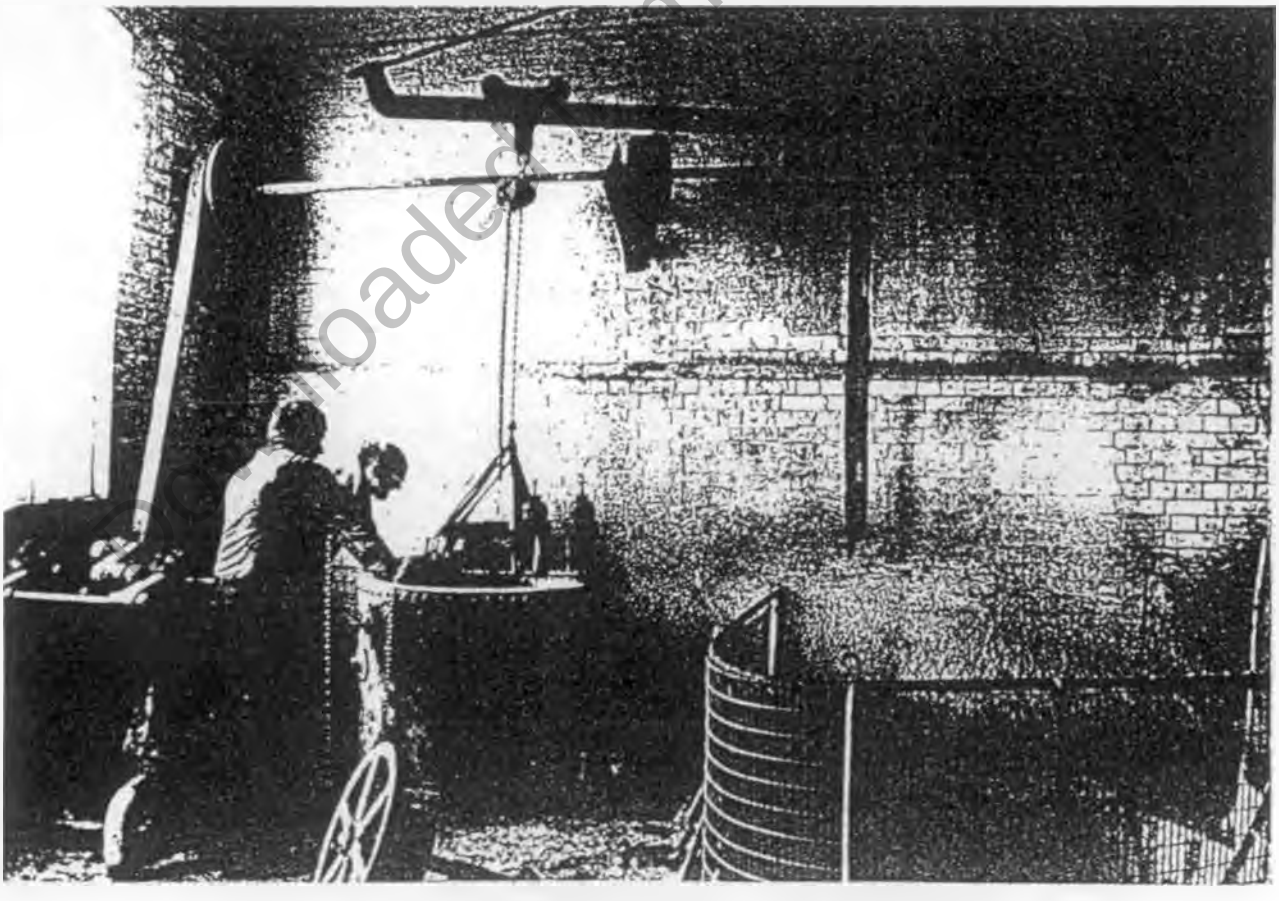


Figure 3 Twyford Waterworks
Volunteers at work shows (l to r) hydraulic engine, mill for crushing lime and storage pit

Downloaded from www.hhs.org.uk



Figure 4
Twyford Waterworks
Hydraulic engine

Downloaded from www.hra.org.uk

The County Council's officers (acting for the Trust) and Southern Water were about to complete the lease when a new problem arose. Southern Water had been granted planning permission to construct a new bottling plant at Twyford to extract '*Hazeley Down*' water. This was to be located behind an overgrown chalk sludge heap and, as it did not affect the Scheduled Ancient Monument site, the Trust were in favour. That was until it was discovered that part of the deal was to demolish the 1951 Rectifier House, which was just outside the area covered by the Scheduled Ancient Monument and, incidentally, had nothing to do with the bottling plant. However it was part of the waterworks, reflecting a phase in its history. Although the proposed demolition was no more than an eccentric aberration by the Winchester Planning Committee, it took a great deal of time to get the decision reversed and, while this was pending, the lease was further delayed. Finally, in the September and October of 1992, nineteen years after the meeting of the first steering committee, the lease was signed.

Among the activities of the Trust, in addition to the study of documentary records, has been the making of tape recordings of

people who have worked in the water industry. In November 1992 we were saddened by the death of two of them - Charlie Gunson who, as Superintendent of Twyford Works had been the last person to steam the Hathorn, Davey engine and Merfyn Hewins, the representative of Southern Water, who had spent all his life in the industry.

For the future, a Five Year Plan to cover the period 1993-1998 has been produced, covering both the restoration of the works and the establishment of a museum of water supply in Hampshire. It includes plans for increased access for the public, particularly after the restoration of steam power. In 1981 Arthur Smyth said that if we wished to attract public interest, we should "get steaming as soon as possible". In May 1994 we hope that it will be possible for our President, Lord Asa Briggs, to restart the Hathorn, Davey engine with steam power, after a break of nearly thirty years. It is a day to which we look forward.

Edwin Course

Sources & Acknowledgements:

Primary Sources:

Records of South Hants Water Co. and of Southampton Corporation Water Committee held in Southampton Record Office.

Records of the Twyford Waterworks Trust held by the Trust.

Secondary Source:

Edwin Course: History of the Twyford Pumping Station *(duplicated by Twyford Waterworks Trust, 1985).*

Acknowledgements:

To Archivist and staff of City of Southampton Record Office for general assistance.

To people involved with the Twyford Pumping Station for information.

Downloaded from www.hias.org.uk

The Lost Cutting

The Southampton and Salisbury Canal at West Dean

The following article raises as many questions as it answers but then, in the age of the Heritage Industry, to find something unexplained and undocumented is a rare treat. To find it in your own back yard makes it even more so. To not share the search for the truth would be greedy. Let us start with a little background information.

My interest in the Southampton and Salisbury Canal was, at first, fairly vague. I was aware of the section shared with the Andover Canal and still in water at Romsey. Gradually, I began to notice remnants here and there, by the laneside or behind a hedge. But it was only when looking for material suitable for publication in *Waterways World* (May 1992) that I went in for any serious research. The only substantial writings I could find on the subject were a study of the collapsed tunnel in Southampton by Dr. Edwin Course (Hants Field Club and Archaeology Society 33, 1977, pages 73-78) and the definitive history of the waterway, *The Bankrupt Canal, Southampton and Salisbury, 1795-1808* by Edwin Welch (Southampton Papers No.5, 1966) which I obtained from the city library. Should you wish to learn the history of the canal, I recommend you to consult the same source. What I intend to deal with here are certain apparent discrepancies in this otherwise excellent work.

It is well known that the most readily available source of information on an area can be found in the local pub. It is also well known that this should be treated with the greatest of suspicion, often being a dangerous cocktail of alcohol and hearsay. The local hostelry in the village of West Dean is the Red Lion, famous for being half in Hampshire and half in Wiltshire. What is less well known is that this pleasant village pub once enjoyed a canalside situation. Enquire of the occupants what they know of the "old canal" and they will happily inform you that the wooden barn by the footbridge was once the warehouse at the local wharf. This piece of information has also found its way into *Hampshire Waterways*, a recent publication by the well known author

P.A.L. Vine. What makes me dubious about this claim is the fact that the building does not appear to have been erected at the time of the Ordnance Survey first series 6" map in the 1870s, several decades after the canal's demise. Indeed, it does not put in an appearance until the revision of 1900. Mr Vine does not question this, despite the building being absent from the map in his book. This looks like an example of the classic pitfall in research where accepting one fact without cross-checking it can lead to self perpetuating errors.

What is less understandable is Edwin Welch's apparent belief that the canal did not even follow the course now marked by the stream and pond in front of the Red Lion, this being the route acknowledged by Mr Vine and every other source I have managed to consult. In his book, Mr Welch describes the course of the canal as follows:

"*In West Dean where there were to be two locks and a wharf the canal has been almost obliterated by the railway and other alterations. On the west of Dean station on the north side of the line a short section can be seen from the train.*"

No other feature is mentioned until the canal "*re-appears on the south side of the railway*" 700 yards further west.

There are several curious aspects about these statements. For the canal to have been obliterated by the railway it would have had to leave its hitherto gently meandering contour course and suddenly adopt a dead straight line, taking it through the site of the present station. The more obvious route, with the waterway maintaining its previous character, would have it following the line of the present day stream and pond. It is this line which seems to be acknowledged by all and sundry, giving rise to the "warehouse" theory.

This more probable route is also backed up by cartographic evidence, all the maps available from the O.S. Record Map Library showing the sinuous contour route, with the line just east of the pond being shown as the classic down-hill-side embankment with drainage ditch. At times of drought, when the stream virtually dries up, the profile of the channel and embankment can be clearly seen and, while the bridge on the west side of the pond is patently not a canal bridge, it would appear to be evident that this was the route of the canal.

This, then, raises certain doubts about Edwin Welch's field research in the area. These doubts swell to serious proportions when we now consider a glaring omission in his text which leads us to wonder whether he actually got off the aforementioned train.

The most cursory of glances at the accompanying enlargement from the 1870s O.S. 6" map will show that, far from 're-appearing' from under the railway to the west of the village, the canal route actually crosses the tracks to emerge in the woodland on the north side. The hachures indicate that it then plunges into a cutting, although this seems to lose its shape and peter out towards the east of the large rectangular pond. As the present day map indicates a clear right of way through the woods, it is perfectly easy to take a walk through these woods and investigate at first hand.

Crossing the arrow-straight railway on the level at the west end of the station, you get a perfect view of the sizeable cutting which contains the tracks. This gives some indication of the considerable spur of land which stood in the way of Joseph Hill, the canal's engineer. Now follow the farm track which bears away from the road to the left hand side. This parallels the course of the present day stream (ie the probable course of the canal). At the point where the track turns away up the far side of this gentle valley, turn left again and cross a footbridge into the woods. The ground from here is fairly featureless until you reach the foot of the dam which holds back the pond.

Skirting this, however, the intrepid explorer will come across a cutting of considerable proportions. Fairly quickly, it becomes clear why this end of the cutting presents such an indeterminate shape on the map. The railway navvies were obviously well aware of the presence of the canal cutting and appear to have used it as a dump for the spoil from their later excavations. Large tailings of chalk intrude into the older work from the south side. Further along, the cutting becomes more distinct until it eventually turns and crosses the railway, beyond which can be seen its continued course, slightly entrenched in the hillside. The depth and width of the cutting makes it all the more astonishing that no one seems to know about its presence. Although heavily wooded, it really is very impressive, especially when inspected in the leafless months.

The position of the two missing locks (numbers 7 and 8) now becomes clearer. The difference in ground level between the sections of canal at either end of the railway cutting is around 5 metres or 15 feet. About half of this is accounted for between the previously mentioned footbridge and the east end of the canal

Downloaded from www.nas.org.uk

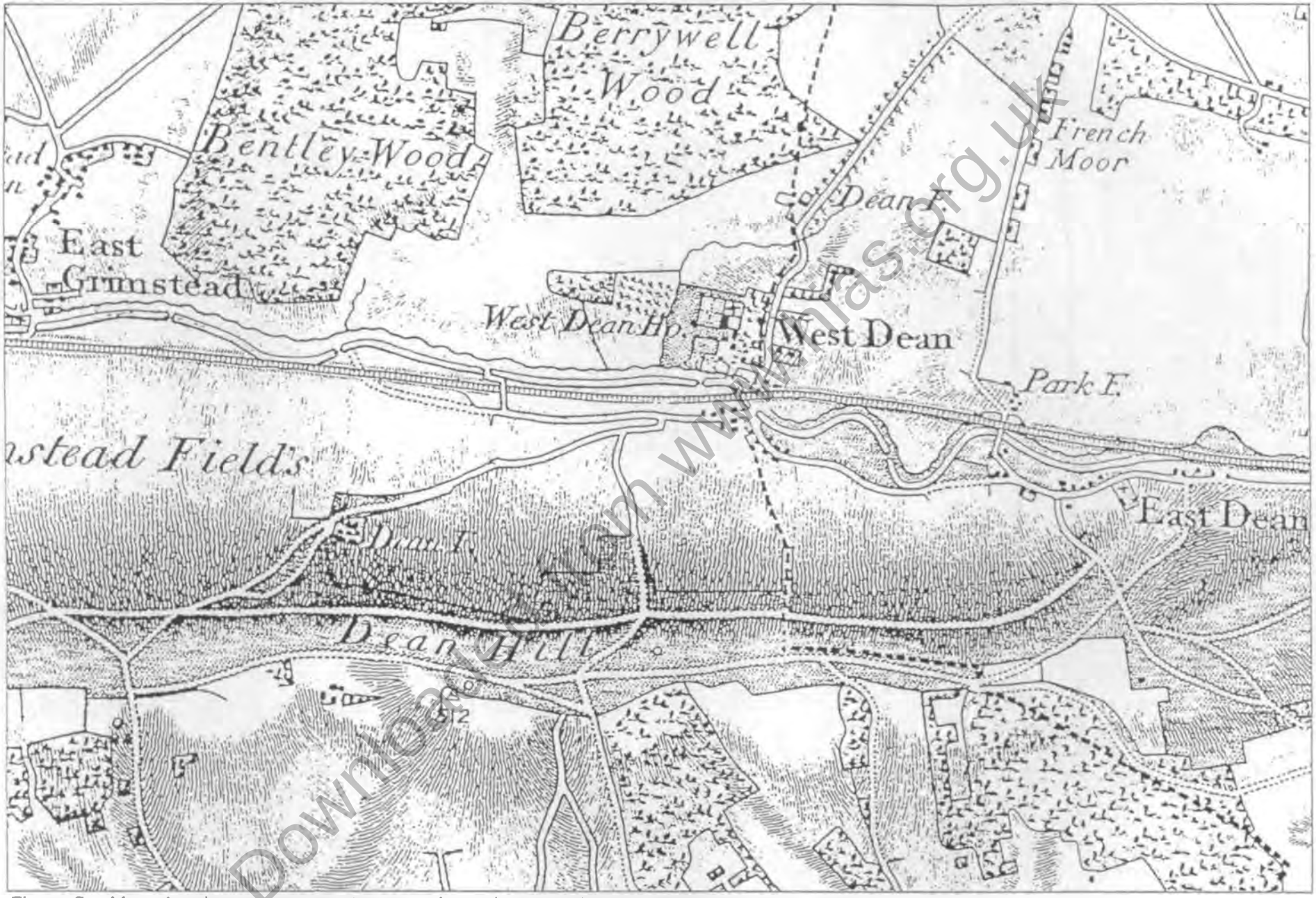


Figure 5 Map showing a separate stream and canal, no pond and a very inaccurate railway.
(Reproduced from the 1811 1" Ordnance Survey map)

Downloaded from www.hlas.org.uk



Downloaded from www.vias.org.uk

Figure 6 The elegant 1870s 6" map showing a fairly obvious alignment for the canal plus stream through the village. Note the absence of the 'warehouse' (location marked by the word 'Ford'). *(Reproduced from the Ordnance Survey map)*

cutting, suggesting a lock somewhere in the vicinity of the pond dam. Near the forty five degree bend toward the west end of the cutting is another distinct change in level, suggesting the location of the second lock. It is an obvious feature of '*The Bankrupt Canal*' that the map on page 39 does not show the location of these locks (although, curiously, it does show the winding route of the canal through West Dean).

Once again we have to question the amount of fieldwork which accompanied the obviously thorough archive research involved in the writing of this book. Was the right of way contested by a militant landowner in the less enlightened 1960s? Did Edwin Welch, denied access on the ground, assume that the railway cutting and the canal cutting were one and the same? Did he not have access to the older large scale maps which show this not to have been the case? More strikingly, has he been taken at his word for the last 29 years, to the extent where nobody has been to look for themselves? Not even the local experts in the transport field have been able to enlighten me or even profess a knowledge of the cutting. As I intimated at the beginning, this has added a wonderful zest to the hunt.

This previous paragraph is, however, little more than idle speculation and should not divert us from the questions which really do need to be asked. If, instead of turning left over the footbridge, you turn up the hill towards the farm, you get a perfect view of the land rising gently around the foot of the spur. This would have been the perfect route for the canal with ample room for the two locks. Why then was it forced to cut through the spur with an excavation which must have cost the penurious canal company a frightening amount of money? Once again, the map may provide an answer.

The most obvious obstruction is the rectangular pond. What is the history of this sizeable (albeit, now shallow) piece of water? Is it old enough to have been a fish pond, providing fresh food for the tables of the clergy? The alignment of the cutting, with two dog-leg bends, would suggest that the pond predated the canal and that the canal was built around it. What was the purpose of the various earthworks indicated by hachures criss-crossing the valley? The 1901 25" map shows the area as being 'liable to floods'. Were the banks and ditches part of an old water meadow or were they just some form of flood protection? Either way, the canal, in its 'natural' route would have cut through all of this. The whole floor of the valley is taken up by farm land annotated *church this* and *church that*, indicating ecclesiastical ownership. Did Joseph Hill come up against the might of the Salisbury diocese and fail to get parliamentary permission to cross this land on the easiest line? I must emphasise that this is, so far, just speculation. Those of you who enjoy dusting off archives could possibly do worse than visit the Cathedral. If we could find a date for the pond and possibly its purpose, it would answer a lot of questions.

What we really need is a detailed map, such as a tithe map, which predates the brief life of the canal (1795-1808). The oldest O.S. map available is the 1" first edition c1810. This shows the line of the canal through the village but has had the 1840 railway line crudely and inaccurately added to the printing plate at a later date. (The early railways were the harbingers of the massive change in the landscape which was eventually to turn cartography from an art to an industry). This early map shows distinct separation between the stream and the canal, with no indication of the rectangular pond. This evidence should not be taken too literally. The first one inch maps were not derived from accurate large scale plans as they are today. (The feeder stream shown on the later maps would indicate diversions built to drain the old canal away from the new railway). To digress for a sentence or two, it is interesting to see how the 1" map shows the canal continuing well beyond its final termination in the cutting at Whaddon Common. The later six inch map shows the remains of some tentative excavations beyond the Southampton to Salisbury turnpike road. It would appear that the dotted lines of prospective motorways on today's maps had their predecessors.

Perhaps the final, and most important question, should be how much did this undoubtedly expensive diversion cost the canal company and how much did it contribute to the eventual failure of the enterprise, with the money running out before the locks down to Salisbury could be constructed? Enough has been written about the disastrous tunnel in Southampton and about the summit cutting on Whaddon Common. Nothing, so far as I can tell, about this hidden curiosity at West Dean. I wait eagerly for alternative opinions and insights.

Jon Sims

(All maps have been enlarged or reduced to show the appropriate features to the best effect).

Downloaded from www.cias.org.uk

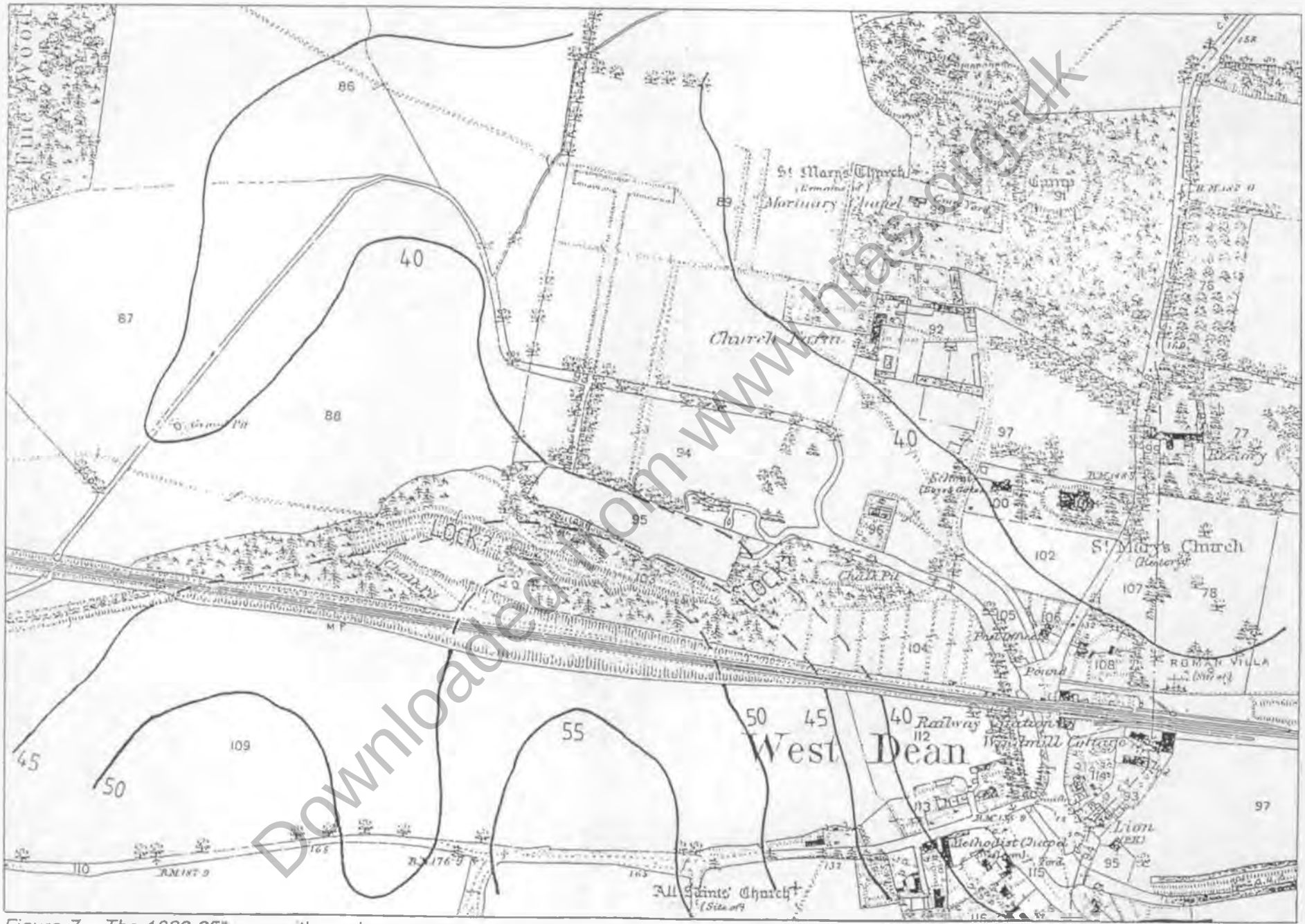


Figure 7 The 1883 25" map with modern contours overlaid to show how the canal had to cut across the lie of the land. Contours at 5 metre interval.

(Reproduced from the Ordnance Survey map)

Downloaded from www.hlas.org.uk

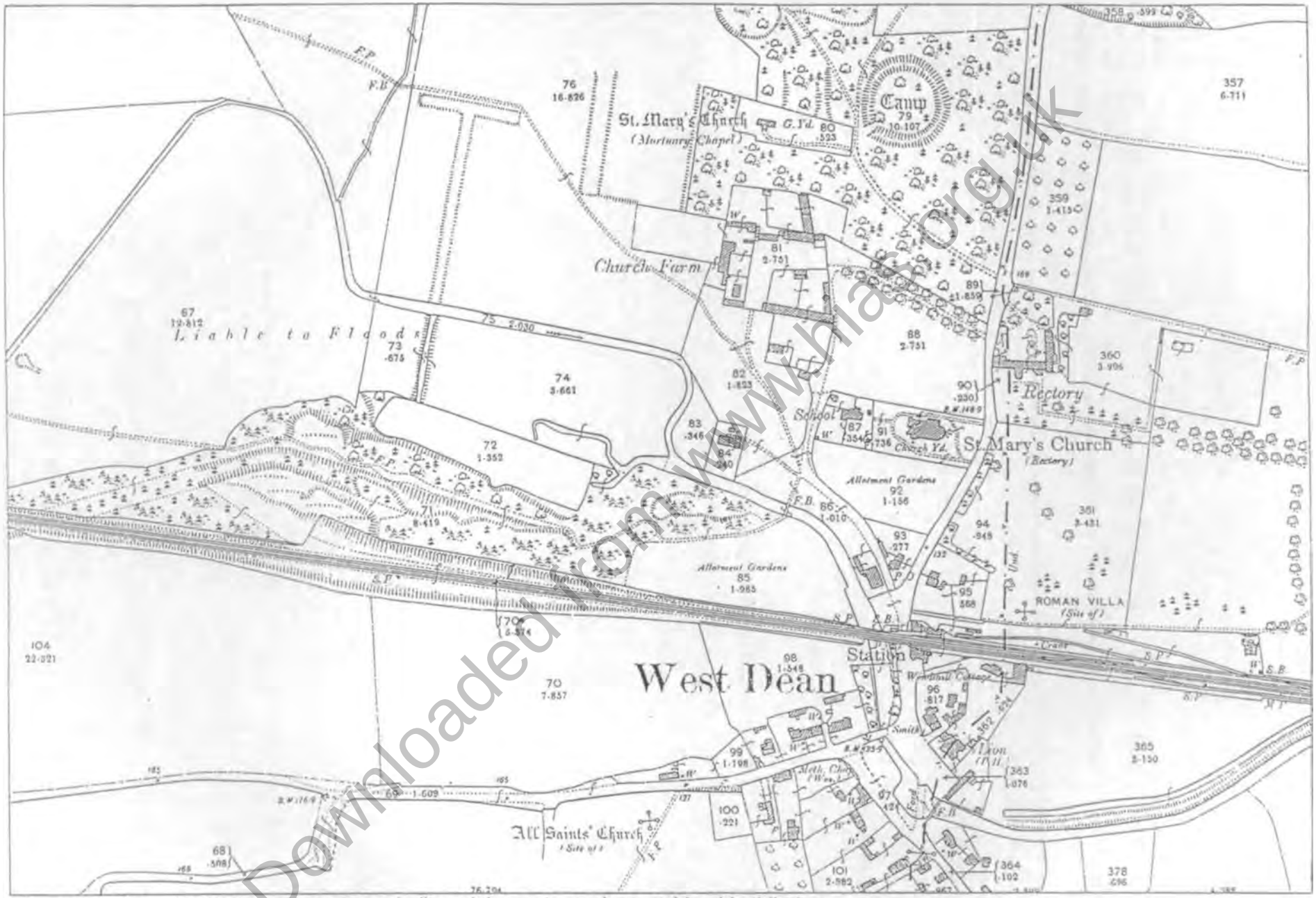


Figure 8 Map with the 'warehouse' now built and the cartography considerably tidied up.
(Reproduced from the 1901 1:2500 Ordnance Survey map)

Downloaded from www.hlaa.org.uk

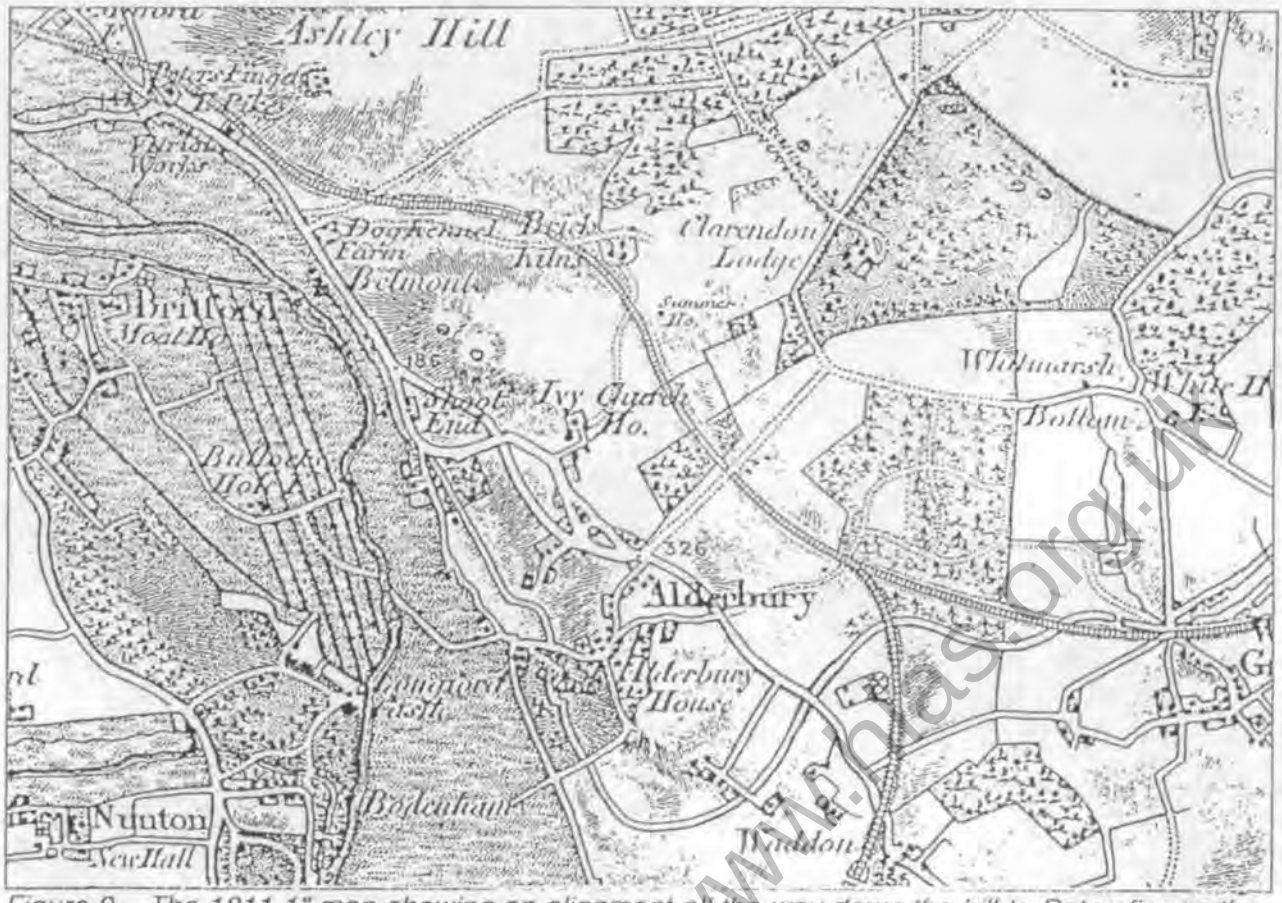


Figure 9 The 1811 1" map showing an alignment all the way down the hill to Petersfinger, the intended terminus of the canal. *(Reproduced from the Ordnance Survey map)*

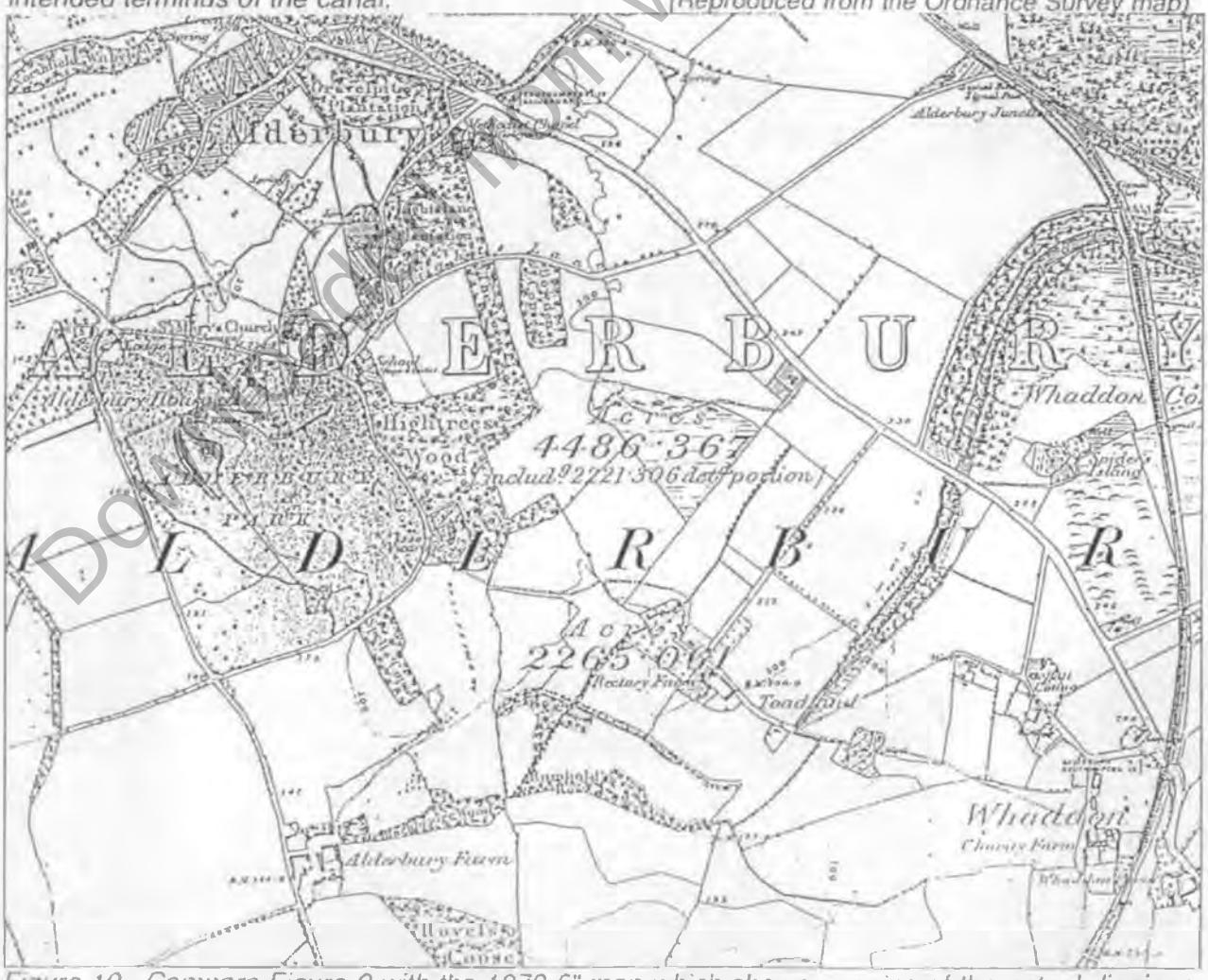
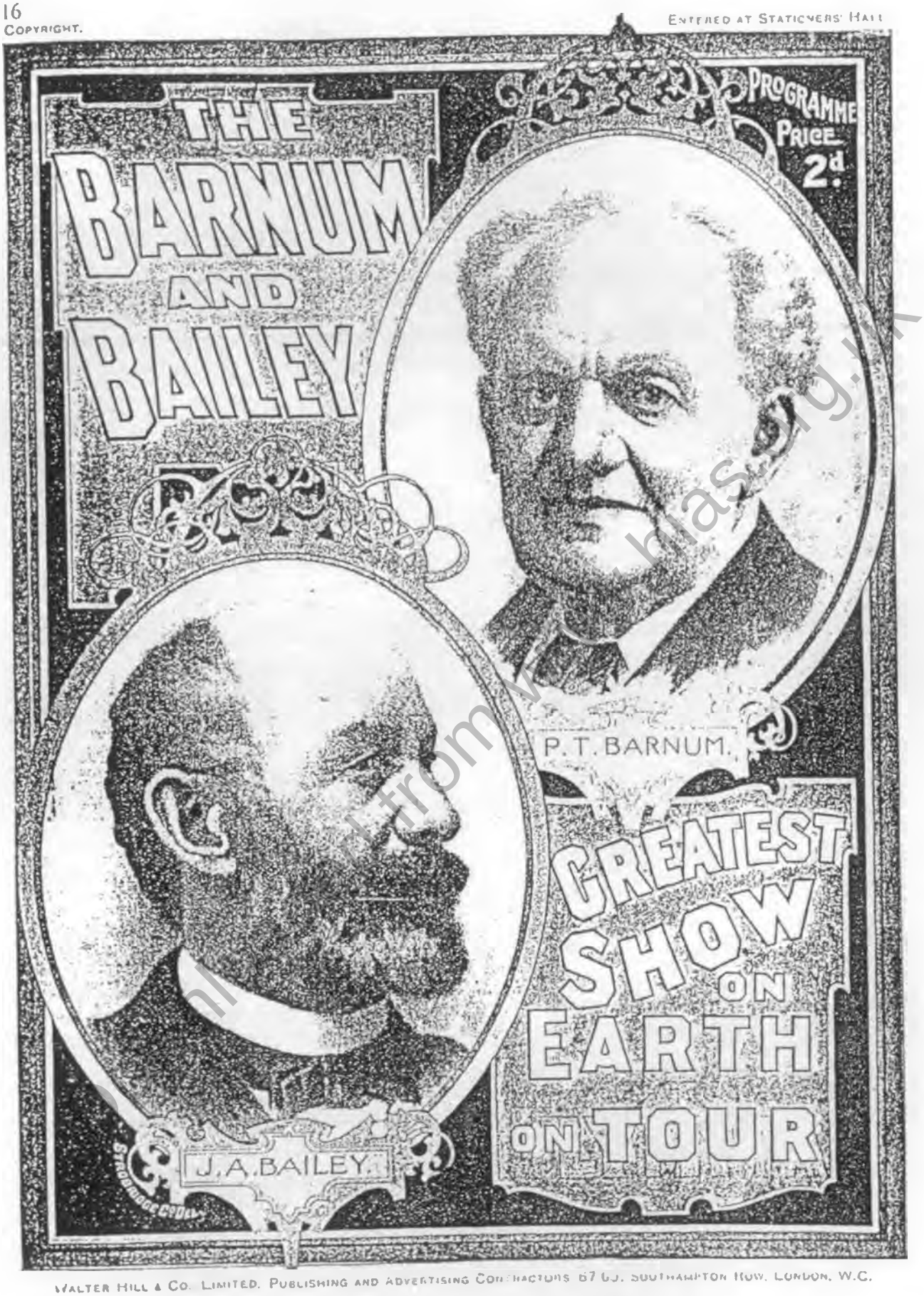


Figure 10 Compare Figure 9 with the 1879 6" map which shows remains of the actual diggings (possibly including the pond in Alderbury Park). *(Reproduced from the Ordnance Survey map)*

Downloaded from www.chas.org.uk

COPYRIGHT.
ENTERED AT STATIONERS' HALL



WALTER HILL & CO. LIMITED. PUBLISHING AND ADVERTISING CONTRACTORS 67 & 3. SOUTHAMPTON ROW, LONDON, W.C.

Figure 11 Cover of original programme

The Circus Comes To Town

In the early hours of the morning of the 11th July 1899 a special train arrived at Southampton Terminus Station. This was followed by 3 more trains and a passenger train from Salisbury. All were owned by the Barnum and Bailey Circus which was touring England. In 1898 they had visited Weymouth and Bournemouth before coming to Southampton, always using their special trains. The animals such as the elephants and horses on the first train would have been fed and watered whilst awaiting the arrival of the 3rd section which contained the work gang responsible for the unloading (Americans called the separate trains *"Sections"*).

The circus was a small town in itself, looking after all its needs from the smithy for the horses to the restaurant for the performers and workers. All had to be loaded on the trains after the end of the last performance at 10 o'clock, transported to the next town and be ready to open the side shows with a street parade at 9 o'clock the following morning.

The performers and workmen numbered 860 people, there were 460 horses and 104 road vehicles (floats, cages and tableaux). The menagerie had elephants, camels, zebras, bears and many other animals such as *Johanna* the female gorilla.

The circus tent was 525ft long, 240ft wide and 65ft high, and had 3 rings for simultaneous performances. As the circus ground at West Marlands (on the site of the present Civic Centre) was not all that large, Southampton only had a 2 ring circus, but normally the tent could seat 15,000 people in separate seats.

The tent for the menagerie was 250ft by 150ft, and another contained the restaurant for 500 people. Other tents contained the freak shows, dressing rooms, lavatories, ticket offices and workshops. This would have been a tremendous undertaking to move at any time but in 1898/99, using railways and horse power, more so.

What a sight this must have been to the people, leaning over the road bridge to see all the shunting of trains and unloading going on in the early hours. The elephants backing out of their special cars; horses, ponies and zebras all being led to the showground. Horse teams were used for unloading the flat cars and pulling their loads up through the town. Having unloaded, performed the parade and given the two performances, the whole lot had to be put back on the train and off to the next town, which happened to be Portsmouth.

The *Barnum and Bailey* circus trains were built by W.R. Renshaw and Co., Stoke-on-Trent. All the vehicles were bogie cars and, at 59ft long, were longer than their English counterparts. An American engineer came over to supervise the construction and it is probable that 68 vehicles were built. The US designs had to be reduced in height for the English loading gauge and all the flat cars were designed for loading from ground level. All the wheels were restricted to 28" diameter because of the height problem and were supplied from Krupps of Germany who specialised in steel wheels.

The stock was made up of the following.

A.....35 Flat Cars
B.....18 Stock Cars
C.....1 Double Deck Pony Car
D.....3 Elephant Cars
E.....8 Sleeping Cars
F.....1 Baggage Car
1 Advertising Car

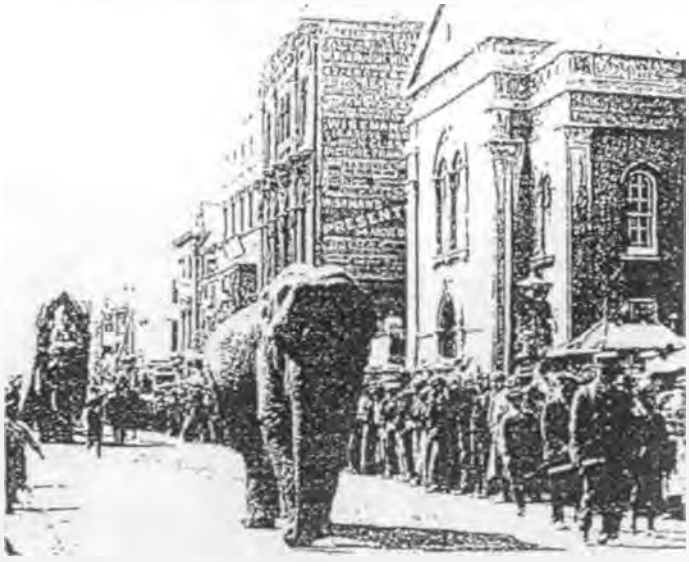


Figure 12 The photo was taken in Southampton of the parade of the Barnum & Bailey Circus. The front elephant is either "Fritz" or "Don", who were the biggest elephants in the circus. The second elephant has an ornate cover on him, and these led the procession of horses, ponies, zebras, bands, floats and cages containing all the other animals. The location is the site of the recently demolished "Odeon" with the "Philharmonic Hall" and "Scullards Hotel" behind the first elephant. The parade was a great attraction and all the townspeople would turn out to see the free show.

(Courtesy Southampton City Archives)

Downloaded from www.hhs.org.uk

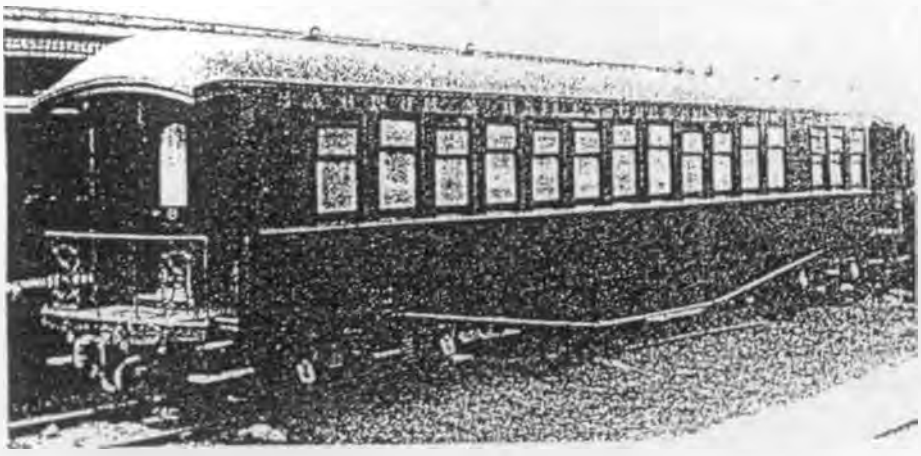


Figure 13. This 1898 photograph shows one of the 68 American-style coaches, flatcars and special vehicles built by W.R. Renshaw of Stoke-on-Trent for Barnum and Bailey.

The trains were made up into the following sections.

Section 1.....3D 12A 1B
Section 2.....1B 7A 1C
Section 3.....1B 3E 6A 7B
Section 4.....1B 5E 10A 1F and probably Bailey's own private car.

All the vehicles had buckeye coupling (American style) but the end wagons had conventional buffers and draw gear.

The advertising car had English couplings to attach it to a scheduled service in advance of the circus, for publicity and site details. The sleeper cars were painted dark lake with gold lettering and the freight cars were yellow with red lettering and underframes painted dark green. All had **BARNUM AND BAILEY THE GREATEST SHOW ON EARTH** on the sides. What a sight to have seen one of these trains travelling through the English countryside.

As the tour proceeded around England, the relevant Railway Group would have provided the locomotives for the trains. The GWR had a 2-4-0 loco designed by William Dean and the class was nicknamed *Barnums* in honour of the circus.

The tour of the circus was extended into Europe and finished with a winter season in Paris in 1901-02 after travelling through Belgium, France, Germany, etc.. Whilst in Germany there was an accident on the railway with damage being done to some wagons. These were replaced by Renshaws at the German Railway's expense.

The carriages and wagons were probably taken across the channel as deck cargo because train ferries as such had not been thought of at this time. Some of the tableaux and floats were brought over and returned to America for their commitments in the States. The trains were probably pulled by continental locomotives with a *barrier* vehicle adapted to suit the different couplings. At the end of the tour the trains were returned to England and the circus returned to the USA.

50 of the original wagons were next used by Buffalo Bill Cody's Wild West Show which had been taken over by the Barnum and Bailey management and toured the UK and Europe from 1903 to 1906, ending at Ghent on the 21 September. The Wild West Show toured the country visiting Dorchester and

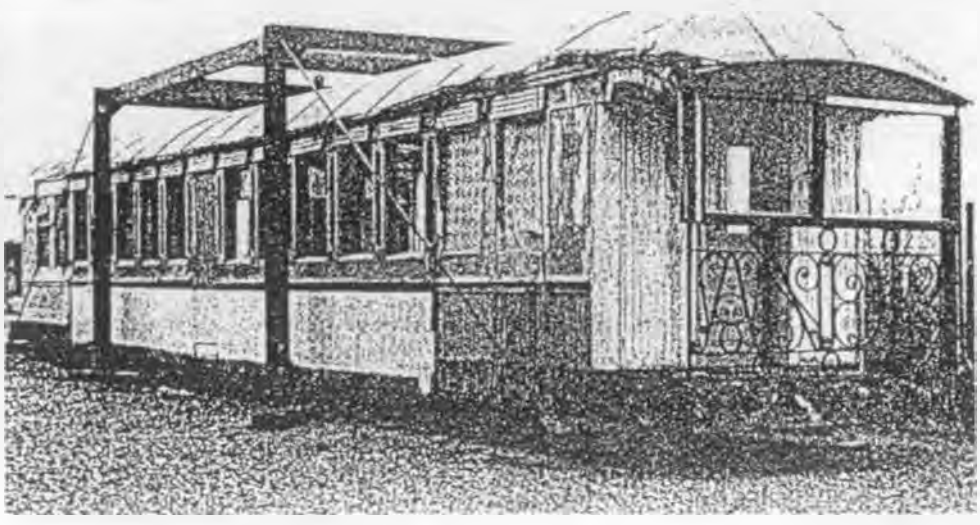


Figure 14. Former Barnum and Bailey coach, later used by the Alexandra (Newport) Docks Railway Company, at the National Industrial and Maritime Museum at Cardiff.

Downloaded from www.nias.org.uk

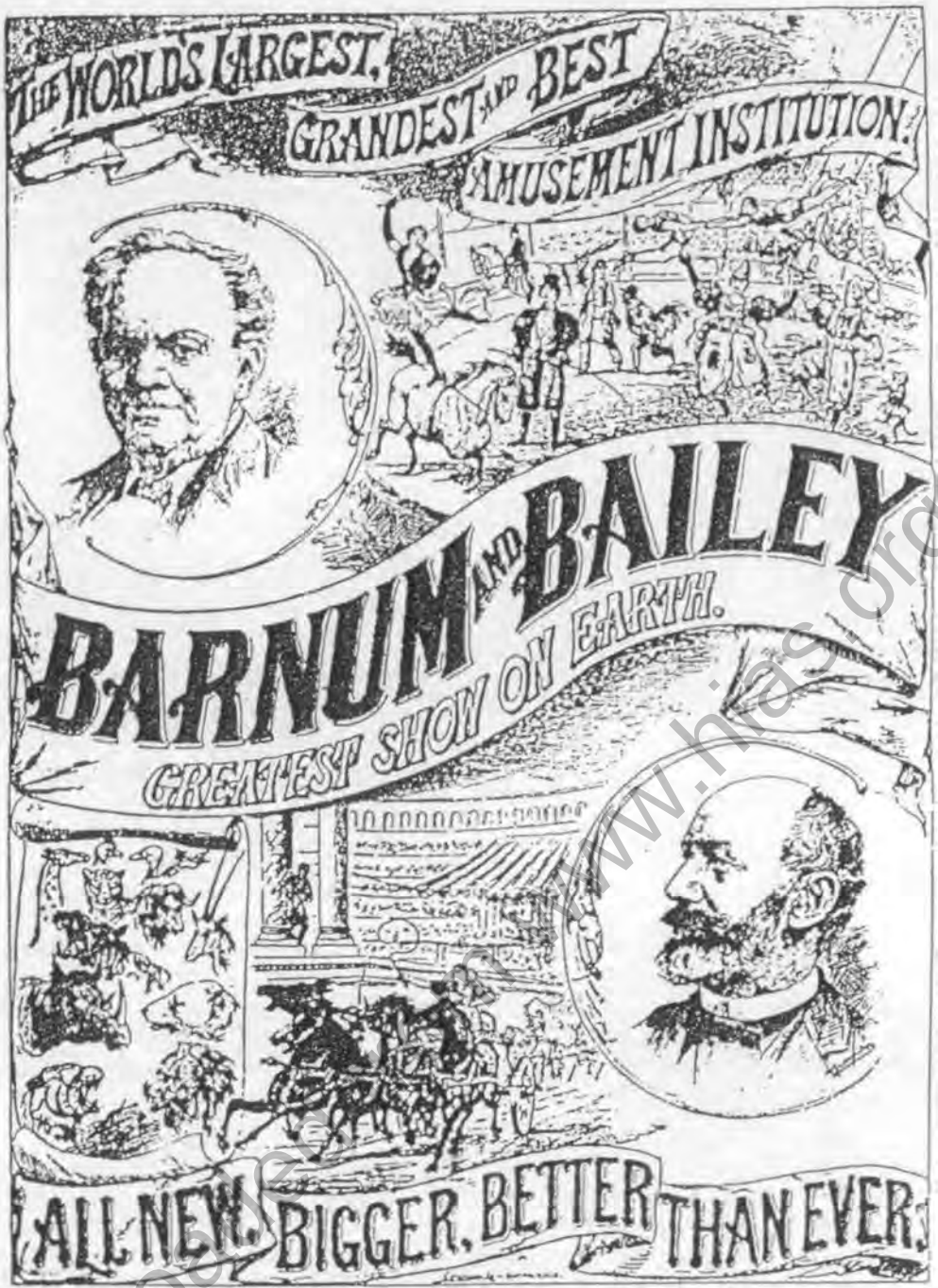


Figure 15. 1899 newspaper advertisement for the circus

Poole before coming to Southampton for the last time in 1906. The railway staff at the Terminus Station must have been getting used to these visits.

The Buffalo Bill show was photographed in black and white and was advertised at the *Empire* Bugle Street for 3 days only on the 22nd, 23rd and 24th of January 1914. A copy of this film has recently been found and after restoration was shown on a television programme about Buffalo Bill.

When the trains became redundant, some of the vehicles were broken up, some went to Chatterley Whitfield Colliery for transporting miners (they were called *Monkey vans*) and others taken over by the *Alexandra (Newport and South Wales) Docks and Railway* and survived into GWR ownership.

Just one sleeping car remains, having been rescued by the Industrial Museum in Cardiff after being used as a holiday chalet in Paignton. If funds permitted, how nice it would be to restore it as a circus sleeping car in its rich red colour and still proclaiming **BARNUM AND BAILEY THE GREATEST SHOW ON EARTH.**

Bill White

Acknowledgments:

Chris Leigh; Theatre Museum; The Echo, Southampton.

Downloaded from www.hias.org.uk

Cast or Wrought?

Iron

From industrial archæologists at site we sometimes hear the query - *"Is it cast iron? Or wrought iron? Or perhaps steel...?"* Almost every industrial artifact embodies ferrous material in one or more of these forms, and some of us may have to confess that we cannot always tell one from the other, or even appreciate fully the distinction between them. But making this distinction may give important clues to the history of the artifact.

It may help us if we review some of the basic facts of ferrous metallurgy. The element iron in its pure form is a moderately soft metal. It is ductile: this means that it can be drawn out into wire, and a rod can be bent cold into a U-form without cracking. It is malleable: it can be shaped by hammering. It is tough: substantial energy is needed to break it apart, and fracture only occurs after considerable distortion.

Really pure iron is something of a rarity. The ferrous (that is, iron-based) materials used in industry consist of iron alloyed with a variety of other elements - carbon, manganese, nickel, chromium and many others. The mechanical properties of the resulting alloys are very sensitive to quite small percentages of the alloying elements, and the metallurgists of today manipulate the proportions of the mix with great subtlety to get the properties - strength, hardness, ductility, corrosion resistance and so on - required in the final product.

The most important of the alloying elements is carbon, to which we shall confine the present discussion. The effect of quite a small proportion of carbon is to increase the strength and hardness of the material, but this is achieved only at the expense of ductility. At around 0.15% carbon we have a ductile material eminently suitable for general construction purposes, for example ships and bridges. As the carbon content increases the strength and hardness goes up until approaching 1% we have a hard, strong alloy which can be forged into edge tools, knives and chisels. With much more than 1% the material becomes increasingly brittle and unworkable by smithing techniques. It can then only be formed by casting from the molten state.

Cast Iron

Consider now the methods used by man to produce usable ferrous materials from the ore. Iron ore can be found in many places in the earth's crust, mainly in the form of the oxides. Some of us may have extracted lumps of *"iron pan"* from our own gardens without realising, perhaps, that it was a usable form of ore. Around 4000 years ago man discovered that the oxide ore could be reduced to metal by heating it in close contact with elemental carbon in the form of charcoal. The intense heat required was achieved by forcibly injecting a blast of air into the furnace. The blast was initially provided by human lungs, later by bellows driven by water power and then by steam blowing engines. The modern blast furnace still works on basically the same principles.

The process relies upon the action of carbon - charcoal in early days, coke for the last 250 years - which reduces the ore to metal by combining with the oxygen in the oxide, forming carbon dioxide which is blown off to atmosphere. Throughout, the metal remains in intimate contact with the excess carbon, and it is not surprising that the liquid metal finally emerging from the base of the blast furnace contains 3% or more of carbon. The metal when solidified is, therefore, completely brittle. It cannot be forged or worked with the hammer, either hot or cold, but it can be formed into quite complex shapes by re-melting and casting into suitable moulds.

The high-carbon iron used in this way is known as cast iron. A cast iron article is often of heavy and bulky appearance, and sometimes shows the *"flashes"*, the small ridges on the surface of the metal where the two halves of the sand mould met during the casting process. If a cast iron article is used brutally, it will shatter in a brittle manner into sharp-edged fragments showing crystalline fracture surfaces, usually grey in colour because of the presence of free carbon particles.

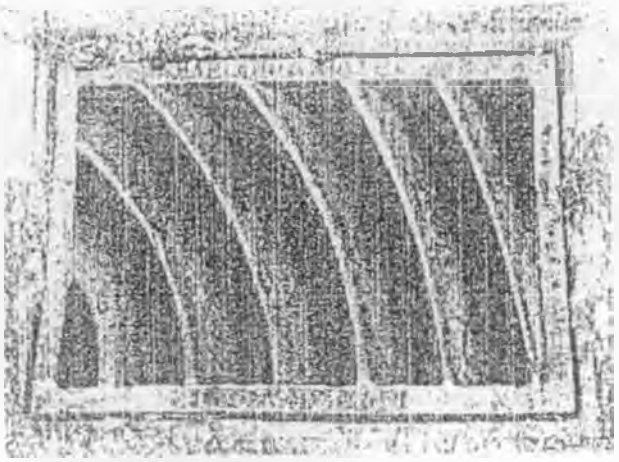


Figure 16 Cast iron drainhole cover

Downloaded from www.hias.org.uk

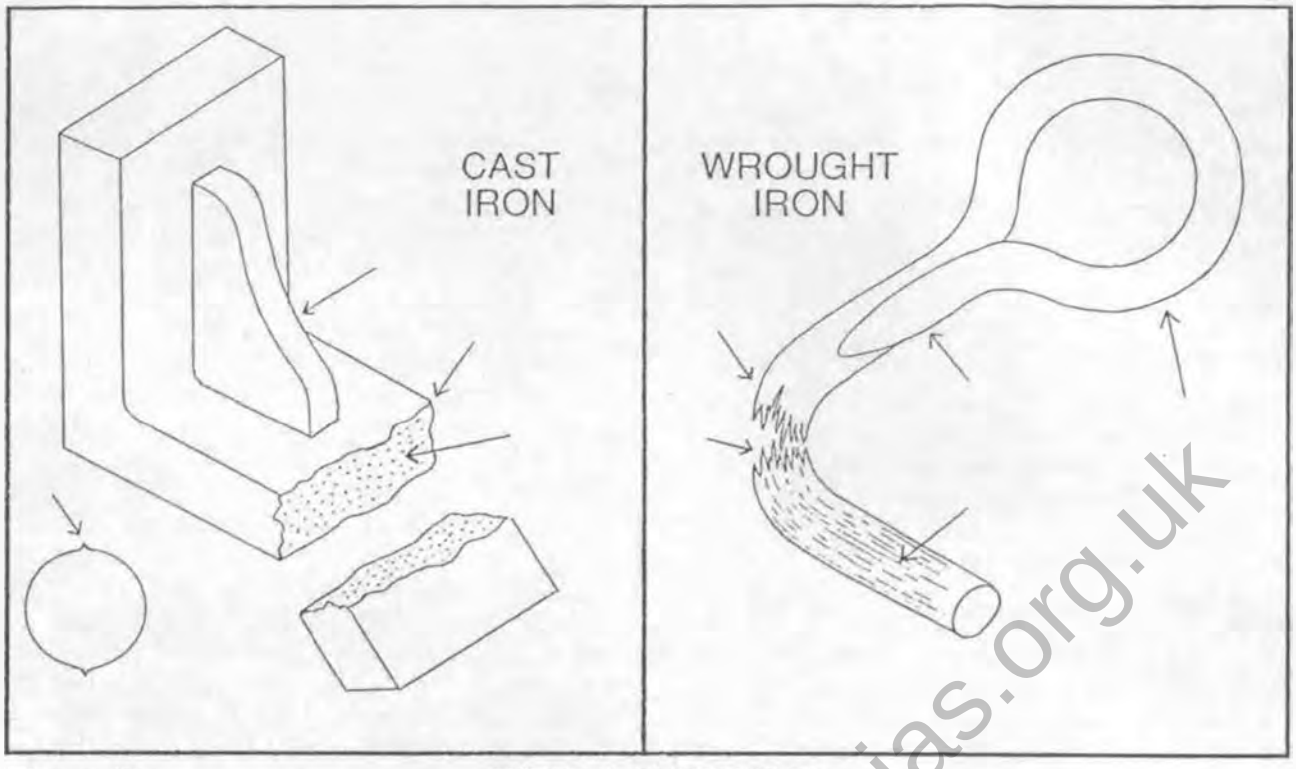


Figure 17 TYPICAL SYMPTOMS

1. Shape: complex, not achievable by hammering, often "chunky"
2. Fracture: brittle, roughly square to surfaces, with no initial distortion
3. Broken surfaces grey, crystalline or granular
4. "Flashes" or ridges indicating line of mould separation

1. Shape: achieved by smithing, hammer marks visible
2. Smith welded joints
3. Longitudinal slag marks, particularly on worn or corroded surfaces
4. Fracture: ductile, showing considerable distortion
5. Broken surfaces irregular and fibrous

Cast iron has been much used for machinery parts of complex shapes, such as engine cylinder blocks and valve chests. Its suitability for reproducing complex shapes from sand moulds prepared from wooden patterns was exploited by the Victorians for producing ornamental ware such as railings, and for adding decorative flourishes to otherwise mundane articles. Sometimes castings were shaped deliberately to imitate more expensive wrought iron work, so that identification requires care.

Although cast iron was used to some extent in the 16th and 17th centuries - firebacks and cannon for example - exploitation of the material on an industrial scale really began in the 18th century when Darby in Shropshire began smelting with coke rather than charcoal, and produced the remarkable range of artifacts which we can see today in the Ironbridge Gorge Museum. Cast iron was then used for the first time for a major structure in the form of the Iron Bridge itself, the prime exhibit of the eponymous museum. This was, however, something of a dead-end development.

The brittle nature of cast iron makes it unreliable for use where a sudden fracture could endanger human life. Some use of cast iron continued into the 19th century for applications where massive dimensions to keep stresses low could be accepted, e.g. for pillars in mill buildings and small canal



Figure 18 Cast iron hydrant cover

Downloaded from www.hias.org.uk

bridges. But further exploitation of ferrous materials in large-scale structures such as ships and railway bridges had to await the development, and availability in tonnage quantities, of a more ductile and trustworthy material, which would bend when overloaded rather than shatter without warning.

Wrought Iron

The brittle nature of the crude blast-furnace product had been appreciated from the earliest days, and various methods of "refining" the iron were developed. The main idea, used in so-called "*bloomeries*", seems to have been to heat the crude iron in contact with un-reduced iron oxide, so persuading some of the surplus carbon, together with pernicious impurities such as sulphur and phosphorus, to unite with the oxygen in the oxide. These means sufficed to produce small quantities of relatively ductile material for such articles as horseshoes, body armour and so on; and also some alloy of moderate carbon content - referred to as steel - for tools and weapons. However, the quantities refined were small and the material was highly variable and uncertain in quality.

The important development occurred in the mid-18th century when one Henry Cort at Fareham developed a superior refining process, known as puddling. This employed a furnace in which a pool of molten material from the blast furnace was held on a bed of oxide. The furnace was a reverberatory one; that is, the coal fuel providing the heat was kept out of contact with the ore and metal, so avoiding contamination of the iron by the sulphur in the coal.

As the carbon was oxidised out of the metal, the material became less fluid, eventually reaching a spongy form with a carbon content of 0.1% or less. A by-product of the process was a glassy slag, which permeated the spongy body. At a moment chosen by the operator, the red-hot mass was lifted out of the furnace and hammered into bars. These were then cut into lengths, bundled and hammered again so as to weld the bars together. Much of the slag was squeezed out in the hammering process. Sometimes the bundling and hammering were repeated several times. Finally the bars were rolled into rods, strips, angle-bars and plates. The whole process made considerable demands on the operator's skill and physical strength.

The term *wrought iron* refers strictly only to the material produced by the Cort puddling furnace, whether or not it appears in hand-worked or wrought ornamental form. Many of the articles loosely referred to nowadays as wrought iron - gates, ornamental railings and so on - should more properly be described as forged mild steel.

Cort wrought iron is a highly ductile, relatively soft material, eminently suitable for working in the blacksmith's forge. Apart from the non-metallic slag inclusions, it is a relatively pure metal, the nearest approach to elemental iron usually met with in industrial use. If heavily stressed, wrought iron eventually fractures in a tough manner - that is, after considerable plastic deformation and the absorption of much energy. The fractured surfaces show a fibrous texture, reminiscent of wood.

A distinctive feature of true wrought iron is the presence of residual slag in the body of the metal. Because of the hammering and rolling processes, the black glassy slag particles become distributed in lines along the length of the bar or plate, so contributing to the fibrous appearance of the fracture. The slag lines can often be seen on the surface of a piece of wrought iron, particularly if the article has been worn or corroded. Slag lines are often very noticeable on old ships' anchors and chain cables which have been in the sea for a long time.

If an article has clearly been formed by hammering, rolling, bending or by blacksmith's techniques generally, then the material cannot be cast iron. If it shows longitudinal grooves or a timber-grain-like appearance on worn or corroded surfaces, then it is almost certainly wrought iron. Wrought iron is particularly amenable to "*smith welding*"; two pieces can be strongly united by hammering them together at a red heat. Visible joints of this sort in an artifact strongly suggest wrought iron.

Cort wrought iron came into use in the late 18th century, production increasing until the mid-19th century, when it was being used on a large scale, e.g. for ships' hulls, bridges and railway lines. However, there were drawbacks, notably the uncertainty of the quality control - the properties of the product depended critically on the judgement of the furnace man - and the small size of the largest pieces available - the *Great Eastern* had to be built of plates only 8ft by 2½ft. Although wrought iron went out of use for shipbuilding and other large-scale applications as the 19th century ended, it continued to find specialised uses, e.g. for chain cable and ornamental work, right up to the mid-20th century. The last commercial puddling furnace went out of production some years ago, but a demonstration furnace still operates at the Ironbridge Museum from

Downloaded from www.hias.org.uk

time to time.

Mild Steel

The term *steel* originally referred to an iron alloy where the carbon content was high enough to give a hard material taking a good cutting edge; tools, swords and other weapons were made of steel, and still are. However, if we adjust the manufacturing process to give alloys of progressively lower carbon content, we eventually arrive at a metal too soft to hold a cutting edge, but of ductility and "workability" approaching that of wrought iron. This is mild steel.

The existence of such an alloy had long been appreciated, but it could not be manufactured in commercially interesting quantities until the Bessemer and Open-hearth processes were invented in the mid-19th century. These processes provided means whereby a large body of iron could have its carbon content reduced in a controlled manner while still in the fully molten state, enabling massive ingots to be cast from which large plates and long bars could be rolled. The improved quality control, the availability of large pieces and a small margin of strength over wrought iron enabled mild steel rapidly to drive wrought iron out of use for major industrial applications such as ships' hulls.

A mild steel article, like a wrought iron one, will normally have been forged, smithed or fabricated out of plate or bars. Castings in mild steel are possible, but unusual. Superficially, it may be very difficult to tell a mild steel article from a wrought iron one; in a new clean state the two materials look very alike. Where there is corrosion or wear, however, the slag lines are a certain give-away for wrought iron. If there is still doubt, and a decision is important, and destructive methods such as deliberate fracturing are ruled out, then it may be possible to simulate natural corrosion by polishing it and etching the material with a suitable acid. This should make the slag lines visible under a lens, or to the naked eye. If an article is clearly a casting, and can be sacrificed, a smart blow with a hammer will show whether it is steel or cast iron; steel will bend or dent, while cast iron will shatter.

Large wrought iron structures were assembled by riveting, as were mild steel structures up to the early-to-mid 20th century. Riveted joints in wrought iron and mild steel look very similar, though such joints tend to be more closely spaced in wrought iron because of the smallness of the pieces available. From the early 20th century onwards, gas and then electrically welded joints appear, at first sometimes alongside riveted joints; nowadays fabrication is almost entirely by electric welding. Gas or electric welds, as distinct from smith welds, almost certainly indicate steel structures of 20th century origin, although welded patches or repairs may occasionally be found on earlier artefacts.



Figure 19 Wrought iron chain - Itchen Floating Bridge, Southampton

Other Kinds of Steel

Mild steel, as its name implies, is relatively soft and is quite unsuitable for application where great strength or hardness is required, e.g. for edge tools, hammers, weapons and so on. For such applications we need to put back some carbon into the metal. One way of doing this might be to check the refining process before the carbon removal is complete, but this would leave the sulphur and other harmful impurities in the melt. It was found preferable to complete the refining process normally, and then to restore the carbon content in a separate operation.

An early method of re-carburising the metal was the cementation process, in which

Downloaded from www.hia.org.uk

wrought iron bars were heated in contact with charcoal in sealed stone chests. During prolonged firing the carbon diffused into the solid iron bars, yielding a high-carbon material suitable for forging into tools. This was a slow and very labour-intensive process. A surviving cementation furnace has been preserved at Derwentcote.

Cemented steel cannot be identified by simple inspection, but etching may reveal the non-uniform distribution of hardness and the slag inclusions arising from the wrought iron origins of the material.

With the development of mild steel in the mid-19th century it was found possible to produce high-carbon and other alloy steels by simply melting mild steel in a crucible and adding carbon and other alloying elements directly to the melt. Nowadays the melting is usually carried out in electrically-heated furnaces.

The above account of industrial ferrous metallurgy, highly condensed and simplified as it is, can be taken as a rough guide to industrial iron and steel work originating up to the end of the Victorian era. In the current century, however, the ferrous materials available to industry have proliferated in number and variety, and identification becomes a matter for the specialist. Industrial archæologists of the future are going to have a much more formidable task in identifying the materials in the artifacts which the twentieth century will leave them.

James Paffett

Gunner and Company of Bishops Waltham

In February 1953 it was announced to the financial world that Barclays Bank Limited had acquired "*the old-established business of Messrs Gunner & Co, bankers*". Usually, bank mergers make headline news and are the subject of columns of comment and analysis, but the impact of this one was, to say the least, muted: indeed, it ranked as no more than a footnote to business history.

This low key reaction is perhaps not surprising, as the total deposits of the bank at the time were only about £130,000, and a total staff of three was not likely to affect the employment market. Historically, however, it was a momentous occurrence which registered in the mind of the writer who, at the time, was working in the Southampton Local Head Office of Barclays, and had thus for some weeks been privy to the fact that negotiations were in progress.

The significance of the event lay in the fact that Gunner & Co was the last remaining private bank in the country outside London, and its disappearance ended a chapter in banking history. A century earlier such banks were the norm rather than the exception, and the principle of limited liability and Joint Stock Incorporation in banking was still novel and suspect. However, over the years, by process of merger [or, in a large number of cases, failure] the number of private banks rapidly declined. A few of them, like Barclays itself, became the nuclei of the large banks we came to know: others became merged into them. Sometimes they were lost without trace; in others the partners became directors of the enlarged organisations, and their descendants continued the family traditions.

Gunner and Co were, from the outset, archetypes of the private country bank - a family partnership, with the partners having unlimited liability for the firm's debts, operating from a single office, serving a limited local community, and carrying on their banking business in tandem with the partners' other professional interests.

It was on 4 October 1809 that Thomas Fox, merchant, Stephen Steele, gentleman, John Goolding Seymour, surgeon and William Gunner, gentleman, entered into articles of co-partnership, agreeing to establish a bank in Bishops Waltham "*with a view to increase their respective fortunes*". Each partner subscribed capital of £1,000, and the partnership was originally to last for 21 years. It was agreed to rent part of the house of William Gunner for £15pa, and the bank remained in these premises throughout its life. The title of "Bishops Waltham and Hampshire Bank" was adopted, and officially retained throughout, though in later years the bank was always known as "Gunner & Co" alone.

Downloaded from www.hias.org.uk

Banker's Licence in England—£20.

STAMP  OFFICE.

WE the undersigned, being two of His Majesty's Commissioners for managing the Stamp Duties, in pursuance of the Act of the 48th year of His Majesty's Reign, entitled, "*An Act for repealing the Stamp Duties on "Deeds, Law Proceedings, and other written or printed Instruments, and the "Duties on Legacies and Successions to personal Estate upon Intestacies, now "payable in Great Britain, and for granting new Duties in lieu thereof,*" Do hereby grant Licence to Thomas Fox. Stephen Steele. John Goulding Seymour. & William Gunner. all of Bishops Waltham in the County of Southampston

Bankers and Copartners to issue any Promissory Notes for Money payable to the Bearer on demand, by the said Act charged with a Duty, and allowed to be reissued as therein mentioned, at Bishops Waltham aforesaid

under the Name of the Bishops Waltham & Hampshire Bank, and under the Firm or Title of Messrs. Thomas Fox Stephen Steele. Jn° Goulding Seymour & Will.m Gunner (such Notes being duly stamped as the Law requires) from the Day of the Date hereof, until the tenth day of October, One thousand eight hundred and eleven both inclusive. Given under our hands this eleventh Day of October One thousand eight hundred and ten

W Lake

Ed. Flatter

Downloaded from www.nas.org.uk

Figure 20 Gunners Bank: Banker's Licence - the original is 9½" x 15"



Figure 21
Exterior of Gunners Bank in 1953. The large section on the left has now been demolished

William Gunner was an attorney [despite being referred to merely as "gentleman"] and the solicitors' practice continued throughout the life of the bank, operating from the same premises. Nothing is known about Steele, who left the partnership in 1816; Seymour, who withdrew in 1840, may have been connected with the Basingstoke and Odiham Bank, Raggett, Seymour & Co. Thomas Fox is known to have been a wine and spirit merchant; nothing is known to connect him with the Fox family of Wellington, quakers and serge makers, who founded the Somerset banking house of Fox Fowler & Co, which itself made banking history by being the last country bank with its own issue of bank notes, which lapsed on acquisition by Lloyds Bank Limited in the 1920s.

Whilst the generally accepted origin of the banking industry is that goldsmiths, looking after plate for the customers, hit upon the idea of lending to other customers upon security, this can really only apply to the major commercial centres, and few of the small country banks originated in this way. What was far more common, especially by the late eighteenth century, was for a local merchant or professional man to realise the gap in the market which was being created by ever-growing commerce. Such men, in the course of their everyday dealings, would already be operating accounts in their books for their customers and clients; these accounts might be in credit, leaving the merchant with the use of funds which would augment financing his customers' business. Either way, he was in fact performing a service to his customer, who had no safe haven for any surplus cash. In pre-banking days, this credit by merchants was a most important source of working capital.

There was, however, another important aspect of the merchant's role. We are now so accustomed to ready access to a vast range of rapid and secure money transfer facilities that it is hard to imagine a commercial world where there were virtually none other than the physical remittance of specie or of the bank notes which had developed to supplement the metal coinage - transactions which would have been fraught with risk, both domestically and in overseas trade. The practice developed quite early of the merchant's customer drawing a Bill of Exchange upon him, out of any credit he had with him, and sending the Bill to his own creditor, who would either sell it to a broker who would collect it, or endorse it and use it to settle one of his own debts. This was a cumbersome process, but it became the main method of money transfer for many years. Its operation in practice is well exemplified in the surviving letters between 1762 and 1776 of Henry Hindley, a linen merchant of Mere in Wiltshire. All his transactions, whether with London, Bristol, Hamburg or Lisbon, were settled in this way, and it was not until late in his career, in 1773, that he opened an account with Hoare & Co of London, whose proprietor was his neighbour at Stourhead.

It was the replacement of this awkward system that proved to be one of the most useful contributions that the establishment of banks made to the mechanics of commerce. The banker offered his customers the facility of drawings their cheques upon him, and the

Downloaded from www.nias.org.uk

cheque [whose legal definition remains as a bill of exchange drawn upon a banker on demand] rapidly became an accepted, indeed preferred, means of settlement.

To operate such a system it was necessary for the banker to have access to the financial market in London and to have an agent through whom he could both clear cheques paid into him by his own customers and receive for honouring cheques drawn on him. In early directories, the details of a country bank always conclude with "draw on ....London". One of the first acts of Gunner and his partners was to open an account for the bank with Messrs Barclay & Co of Lombard Street, and they were to remain the London agents for the whole life of the bank.

Bishops Waltham was never, of course, a centre of trade, and in this case undoubtedly the incentive to establish a bank arose from the fact that William Gunner was the local solicitor. In this capacity he would naturally handle considerable sums of money for his clients and was well placed to assume the additional role. It is significant that, right to the end, the bank ran in parallel with the solicitor's practice, which was conducted from the same premises and ultimately virtually by the same partners.

One of the attractions, initially, of becoming a banker was the opportunity to issue one's own bank notes; these, of course, in effect were interest-free borrowing by the bank! There was, however, great public concern at the effect of frequent bank failures; from 1844 no further banks were allowed to issue notes, and those already issuing them lost the right on any acquisition of their business; the Bank of England, whenever it could, bought out the right of others. In the case of Gunner & Co the maximum issue was fixed by the 1844 Act at £1,993 but, before the Act came into operation, the bank compounded to issue Bank of England notes and for this they received an annual payment from the Bank of England "in composition", which continued until 1953.

One might have thought that some of the original partners would have merely been sleeping partners, but a clause in the partnership deed stipulated that each one of them should give his attendance in rotation on two successive days from twelve noon to three in the afternoon. This must imply that they did in fact reside in or near Bishops Waltham. They also agreed that if any partner were to lose at any time £100 by betting, hazard or chance he should forfeit £2,000 and his partnership should end.

Of the original partners, Steele withdrew in 1816 and Fox in 1834; on the expiry of the original 21 years, Seymour withdrew, and William Gunner took his two sons Thomas and Charles into the firm, under the title Gunner & Son. In 1851 William retired, and the new partnership of Gunner & Co [the final title] was formed by Charles, also a solicitor, Thomas John Ridge of Hambledon, his cousin, and Thomas Fox, of Pratt St., Lambeth. The latter, presumably a relation of the original partner, is referred to as a distiller of Finsbury and Pimlico.

On the death of Charles in 1872, the partners, each contributing £1500, were his widow, Caroline, Ridge and Fox, and James Lock, who was appointed manager at a salary of £150 plus his share of the profits. Ridge died in 1873, Fox withdrew in 1877, and Lock retired in 1883, when Caroline's sons William, an Army officer, and Charles, solicitor, became partners; henceforth the bank was exclusively a family affair. In 1898 T.J.Brown appears as manager, the only occasion on which that office went outside both partnership and family.



Figure 22 Gunners Bank cheque - the original is 11" wide, printed on green paper in black ink with the oval 2d seal in blue (writer's collection)

Downloaded from www.nias.org.uk

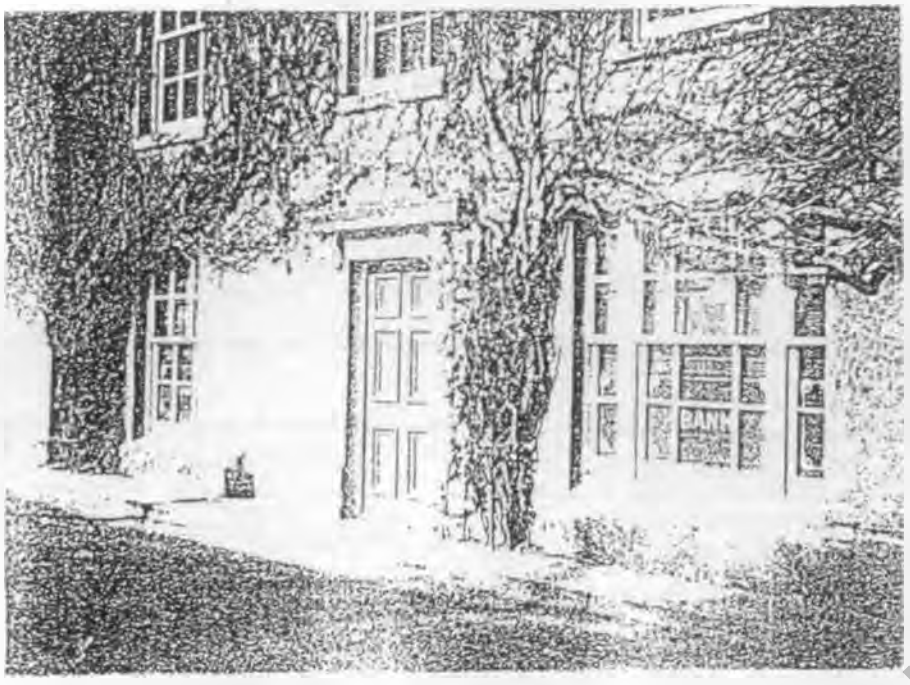


Figure 23
Gunners Bank
The word "BANK" can be seen in the lower central pane of the nearest window.

Caroline was the senior partner from 1872 until her death in 1906; she owned half the capital of the bank. It is salutory today, despite all one hears about discrimination, to realise that a century ago it was perfectly possible for a woman, albeit one with privilege, to occupy such a position (though a married woman would have been unable to do so until 1882).

On Caroline's death the business was continued by her two sons, Lt. Col. W.H.R.Gunner and C.R.Gunner, solicitor; in 1918 they admitted Walter Robin, Charles' son, as a partner. By this time the bank faced competition; Capital and Counties Bank Limited [later taken over by Lloyds Bank] had opened in Bishops Waltham in 1899, and Barclays opened a branch there in 1921. This entry into the town by Barclays does not seem to have upset the agency relationship, however. In 1909 the partners opened a sub-branch at Wickham, open on Tuesdays and Fridays only; this venture was closed on the outbreak of WW1 and never reopened.

On Col W.H.R.Gunner's death, in 1921, the partners became C.R.Gunner, senior partner, Ernest John, his brother, designated as manager at £125 pa, Walter Robin, his son, and Major Frank Hugh Gunner, son of Col Gunner. C.R.Gunner died in 1924 and E.J. in 1925, when F.H.Gunner was appointed manager. By 1947 the latter had a 2/3 share of the business.

At the final acquisition of the business, Walter Robin and Frank Hugh Gunner were the surviving partners, and Frank was appointed a Local Director of Barclays Bank at Bishops Waltham. This post was a purely honorary one; he played no part in the business, and died the following year.

In 1953 the partners regretfully reached the conclusion that there was no longer a place in the banking world for so small a business, and approached Barclays with a view to amalgamation. Although the figures involved were so small, it was necessary under the Treasury Edict of 1920, designed to maintain competition in banking, to obtain Treasury permission through the Bank of England. Upon the acquisition, all the business was immediately transferred into Barclays' Bishops Waltham branch, and the customers became customers of Barclays.

The business of the Bank had always been predominantly local - one has to remember that before the railway came, and for a long time thereafter, Bishops Waltham had been a self contained community - and as a result must have been personal or agricultural with some retail trade.

At the end, the customers were almost entirely personal and local, rather than commercial; indeed, many of Gunners' customers undoubtedly banked there for sentiment or because some cachet was seen in having one of their cheque books. The only account of any size was that of the Droxford Rural District Council, where the Gunners had been Treasurers for many years. Barclays branch, itself quite a small one, only had to increase its staff by two to service the newly acquired business.

Downloaded from www.hias.org.uk

The merger took place just as a revolution was commencing in banking. Had one of Charles Dickens' characters, or the first of the five head clerks who ran the day-to-day business over the years, entered Gunners Bank he would have found himself in familiar surroundings, with probably only gas lighting, the typewriter and the telephone strange. Mahogany counter, sloping desk for the clerks, who sat on high stools with steel pens, and windows obscured by brown perforated zinc screens with the word "Bank" displayed in gilt to the outside world, can have hardly changed since the early days of the bank. Just as the age of the computer was about to dawn, the last of the private country banks closed its doors.

Now only the building remains, still called *Bank House*, although used by the Registrar of Births, Marriages & Deaths. Of the original three sections, one has been demolished and two remain virtually unchanged.

Whilst everything else has gone, we are fortunate in one respect. The partners had preserved virtually all their books of account, and these were passed over to Barclays, whose archivist has custody of what is thought to be the most complete set of records of such a bank. In the 1970s the late R.A.Hodgson, of Southampton University, made a fairly detailed study of them. His work was published in the *Portsmouth Archives Review* (Vols 2, 3 and 4).

M.F. Tighe, B.Sc.[Econ].FCIB

Sources and Acknowledgements:

(1) WRO 314; publ. as "Wiltshire Textile Trades in the XVIIIc" Wilts Record Society 1964.

(2) Partnership deeds held by Barclays Bank PLC Group Archive Dept.

The writer wishes to record his thanks to Mrs. Jessie Campbell, Senior Archivist of Barclays Bank PLC for her assistance in the preparation of this article, and to Mr. H Gunner.

Downloaded from www.hias.org.uk

Canal Restoration In Central Scotland

When heading north to sample the attractions of the Highlands, those with an interest in canals would do well to break their journeys in the rather less scenic Central Lowlands to observe what is happening to that area's two canals - the Forth & Clyde and the (Edinburgh & Glasgow) Union - which, because of their geographical separation from the main canal system in the UK, are often forgotten. Both canals were officially abandoned in the early 1960s; indeed, the flight of locks connecting them at Falkirk was filled in as long ago as 1935. But for all that, they are still both very much in evidence and, due to the efforts of enthusiastic Canal Societies, with financial support from enlightened local authorities, some of their former glory is being restored and navigation, albeit restricted, is once again possible on selected stretches of both canals.

Forth & Clyde Canal

Those who took part in the 1986 *SUIAG* field visit to Central Scotland will recall that the Forth & Clyde Canal, built essentially as a small Ship Canal, opened just two hundred years ago (1990 was, in fact, the bicentenary year) to link the Forth at Grangemouth with the Clyde at Bowling. A short branch led into Glasgow to meet that City's demands and it was possible for small coasters from across the North Sea to discharge their cargoes at the wharves comprising Port Dundas in the heart of Glasgow. Fishing boats could also pass through the Forth & Clyde Canal, enabling the fleets to take advantage of the fishing grounds around both Scottish coasts. The Union Canal, on the other hand, was built purely as a barge canal to link Edinburgh with Falkirk and via the Forth & Clyde on to Glasgow and, more particularly, the Lanarkshire coalfield. Leith, already being established as the seaport for Edinburgh, dealt with coastal shipping.

As constructed, therefore, the Forth & Clyde had unrestricted headroom, all bridges being of either the swing or lifting bascule types. Unfortunately, such bridges were totally unsuitable for the demands of modern road traffic and, following the abandonment in the 1960s, many were replaced with fixed bridges giving negligible headroom or, in some cases, by culverted embankments, effectively severing the canal into discrete sections. The plan now being actively pursued is to replace these obstructions to navigation with new overbridges giving 3m minimum headroom, which will permit most cabin cruisers and yachts with their masts stepped to proceed along the navigation unimpeded. Some £2·5m

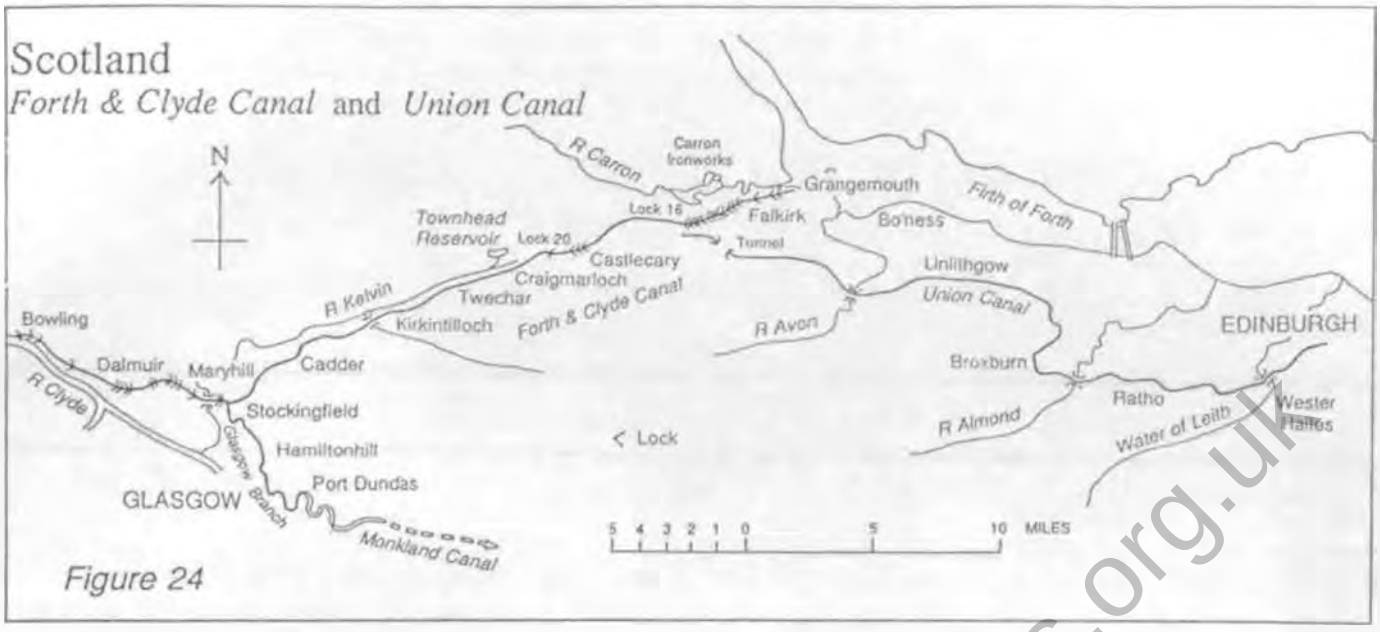
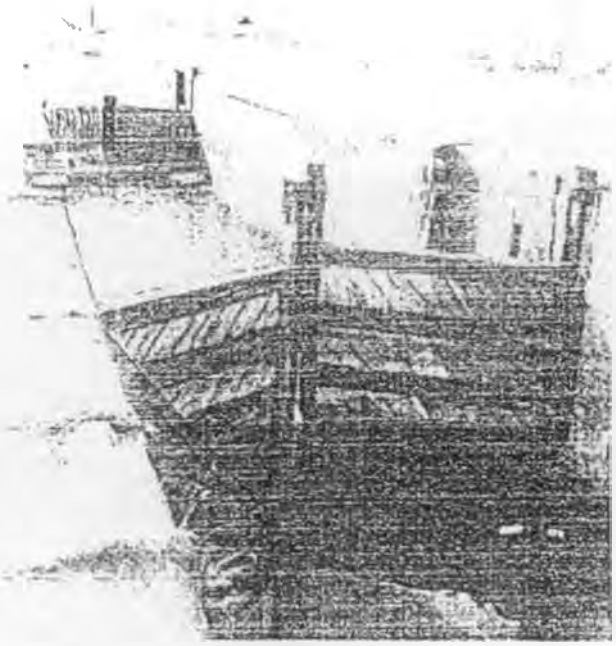


Figure 24

has been earmarked for improving the canal in the Glasgow area alone and already several bridges have been raised to meet the new requirements, including that carrying the A803 Glasgow Road east of Bishopbriggs. When this work is complete, a 12 mile stretch of canal will be navigable from Glasgow to the Townhead at Kirkintilloch. But this is just the beginning; improvements to the sea locks and basins at Bowling will enable entry from the Clyde at most states of the tide and attention to bridge clearances and lock repairs through Clydebank district will add another 8 miles of navigable waterway.

In Glasgow itself, the Maryhill Locks and Kelvin Basin - where, at one time, Clyde *Puffers* were constructed - have been tastefully restored and general repairs have been effected to the nearby Kelvin Aqueduct. At the end of the Glasgow arm, the original Forth & Clyde Company Office building has been restored and the row of large warehouses at Spiers Wharf have been refurbished providing living apartments and shops to form the nucleus of a canalside community. This has given a new lease of life to the old Dundas Basin and eventually secure moorings will be provided in the form of a marina. Two former Clyde ferry boats, displaced by the building of the Erskine Bridge, have been acquired to serve as trip boats and currently operate eastwards from the top of Maryhill Locks, maintaining the tradition of waterborne excursion facilities along the canal which existed prior to 1939. Trip boats also operate westwards from Kirkintilloch, including one for the disabled owned by Seagull Trust.

Beyond Kirkintilloch, where the local museum pays due regard to the canal and the local boatyards where *Puffers* were also constructed in fair numbers, the canal assumes a more rural character. Excellent views can be had along this, the summit, pound across the valley of the River Kelvin, which has been followed all the way from Glasgow. Near the commencement of the descent to the Firth of Forth, the canal is crossed by the M80, under which the water has been culverted. Just how this obstruction can be overcome in the plan to reopen the coast-to-coast navigation throughout is not clear, but there is great determination to do so. The summit level of the canal also follows the line of the Antonine Wall, which defined the most northerly boundary of the Roman Empire, and traces of this fortification can still be clearly seen in places along


Figure 25 A lock in the Camelon flight at Falkirk, 1973

Downloaded from www.inrs.org.uk

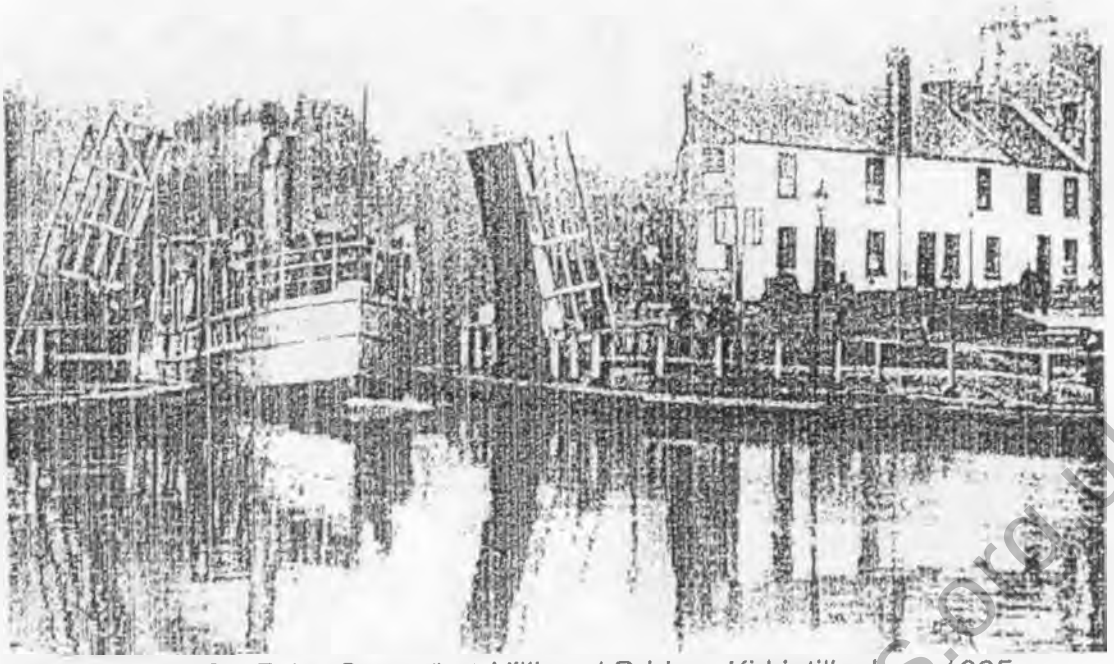


Figure 26 S.S. "Fairy Queen" at Hillhead Bridge, Kirkintilloch, c. 1895

the route between Twechar and Bonnybridge.

Through the Falkirk area the canal appears to be in good shape, though again a number of main road crossings have formed major obstructions to navigation. Proceeding eastwards and approaching Grangemouth, the last mile or two of canal have disappeared into a pipe as part of a road widening scheme, giving improved access to the docks. The possibility exists, however, of overcoming this impediment by reviving an old channel linking the canal with the nearby River Carron. With some canalisation of this river, access to the Forth could be relatively easily achieved and might prove the catalyst for improving leisure boating facilities on this great stretch of water. These ideas are receiving active consideration and it is by no means impossible that the early years of the next century will see the Forth once again joined to the Clyde by a fully navigable waterway, as was the case throughout the 19th and early 20th centuries.

Edinburgh & Glasgow Union Canal

In the case of the Union Canal, ambition does not run so high, as the canal is permanently isolated at the Falkirk end by the eradication of the flight of 11 locks which descended to the now infilled Union Basin on the Forth & Clyde Canal. Furthermore, the Union Canal is severed by the M8 crossing just to the west of the Almond Aqueduct and also in the western suburbs of Edinburgh, where the large Wester Hailes housing development necessitated running over a mile of the canal in culverts. Nevertheless, the lock-free stretches between Falkirk and the M8 and that continuing on towards Wester Hailes are both subjects of active restoration and improvement. The western length of the canal, which includes Scotland's only canal tunnel as well as the massive Avon Aqueduct, is particularly attractive, providing long views across the Firth of Forth to Kinross and the Ochil Hills. In the Linlithgow area, a small canal centre has been established with a museum and a base for trip boats, one of which is a finely restored steam launch - the *Victoria*.

At Ratho, on the stretch east of the M8 crossing, the old Bridge Inn has become a focus of canal activity, the pub and restaurant being something of a canal museum and operating two large trip boats along this rural length of waterway up to the Almond Aqueduct. Quarries along this section of the canal provided much of the stone used in the buildings of 19th century Edinburgh and hence good revenue for the canal, but all are long since worked out and have become a centre for rock climbing activities.

The third and shortest section of the canal, from Wester Hailes to the former Lochrin Basin in central Edinburgh, including the Slateford Aqueduct over the Water of Leith, is restricted at present to light craft only. This stretch of canal is not without interest, though the urban surroundings limit its potential as a major leisure amenity. Nevertheless, it is apparent that the City of Edinburgh has become aware of its canal heritage.

There are in all some 70 miles of canal still to be seen in the Lowlands of Scotland and these are now no longer being neglected; a visit to them will prove very rewarding, both for the industrial archaeologist and the layman alike.

Gerald Davies

Downloaded from www.hias.org.uk

SUIAG Publications

Monica Ellis *Ice and Icehouses Through the Ages* (with Hampshire gazetteer) 1982 **£2.25**

Southern Railway *A Souvenir of Southampton Docks*
1982 (replica of publication *c.* 1930) **£1.50**

Edwin Course *The Itchen Navigation* 1983 **£1.95**

Pam Moore (ed.) *A Guide to the Industrial Archaeology of Hampshire and the Isle of Wight* 1984 **£1.80**

Edwin Course and Pam Moore *The Changing Railway Scene in Hampshire*
1991 **£4.50**

Adrian Rance (ed.) *Seaplanes and Flying Boats of the Solent*
1981 **£3.95**

Edwin Course (ed.) *SUIAG Journal No.1*
1992 £4 (to non-members)

All the above are obtainable from Capt Ivan Downer, *Publications Officer, SUIAG,* 4 Hartley Close, Bishopstoke, Eastleigh, SO5 6SE (postage and packing extra). Other publications, including *Shipbuilding in Victorian Southampton* and *Water and Windmills in Hampshire and the Isle of Wight* are temporarily out of print.

Downloaded from www.hias.org.uk

Contents

Twyford Pumping Station
Southampton & Salisbury Canal - The Lost Cutting
The Circus Comes To Town
Cast or Wrought?
Gunners Bank
Canal Restoration in Scotland

Downloaded from www.hias.org.uk

Cover: Twyford Pumping Station - triple expansion steam engine